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New Orleans District

CULTURAL RESOURCES INVESTIGATIONS OF LAROSE TO GOLDEN MEADOW HURRICANE PROTECTION PROJECT LEVEE SECTION D, LAFOURCHE PARISH, LOUISIANA

March 1991

FINAL REPORT

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PREPARED FOR:

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19. ABSTRACT (*Continue on reverse if necessary and identify by block number*)

Archeological survey consisted of intensive pedestrian survey augmented with systematic shovel testing. Approximately 210 acres were surveyed. One previously recorded archeological site, Bayou L'Ours Mounds (16LF54), was identified. This site consists of two prehistoric earthen mounds, shell middens, and associated habitation area overlooking West Fork Bayou L'Ours, within the Lafourche delta complex. Additional shovel testing, auger testing, and test unit excavation at 16LF54 helped define the horizontal and vertical limits of the site and yielded a variety of ceramic types probably dating from Troyville through Mississippian periods. In addition, a human (female) burial was recovered during test unit excavation. The burial likely occurred during the early occupation of the site. A variety of faunal remains were recovered from the site, as well. Although 16LF54 had been disturbed by excavation of an inlet and several borrow pits, most of the site possesses good archeological integrity and considerable research potential. Site 16LF54 should be avoided during levee construction or excavated further to mitigate impact of the site. Finally, a locus of modern refuse associated with a hunting camp was identified within the project area; it lacked research potential due to its recent age. No further testing is recommended at this locus.

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REPLY TO
ATTENTION OF:

March 1, 1991

Planning Division
Environmental Analysis Branch

To The Reader:

The investigation reported in this volume was funded and guided by the U.S. Army Corps of Engineers, New Orleans District. The work was performed to provide information needed to assess cultural resource impacts which could result from construction of part of the Larose to Golden Meadow Hurricane Protection Project.

This report has been reviewed and accepted by the New Orleans District. We commend the Contractor's efforts and careful scholarship.

Van Tries Button
Technical Representative

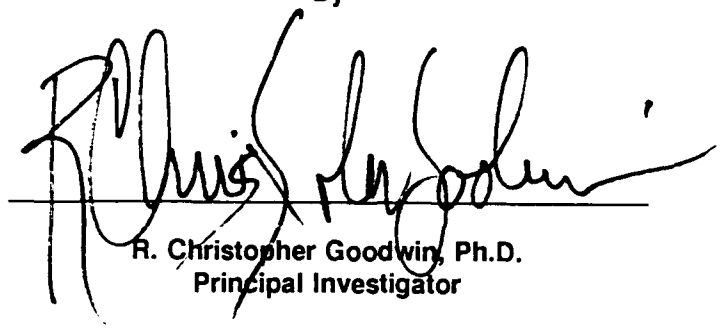
Carroll H. Kleinhans
Authorized Representative
of the Contracting Officer

R. H. Schroeder, Jr.
Chief, Planning Division

CULTURAL RESOURCES INVESTIGATIONS OF LAROSE TO GOLDEN MEADOW HURRICANE PROTECTION PROJECT LEVEE SECTION D, LAFOURCHE PARISH, LOUISIANA

FINAL REPORT

By



R. Christopher Goodwin, Ph.D.
Principal Investigator

With

Stephen Hinks, William P. Athens, Ralph Draughon, Jr., Jennifer A. Cohen, William A. Morgan, and Paul V. Heinrich

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March 1991

For

U.S. Army Corps of Engineers
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P.O. Box 60267
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Contract No. DACW29-88-D-0121, Delivery Order 08

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CHAPTER I

INTRODUCTION

This report presents the results of cultural resources investigation of Levee Section D of the Larose to Golden Meadow Hurricane Protection Project in Lafourche Parish, Louisiana. The survey was conducted during March and April 1990, by R. Christopher Goodwin & Associates, Inc., for the U.S. Army Corps of Engineers, New Orleans District, pursuant to Delivery Order 08 of Contract DACW29-88-D-0121 (Appendix I).

The Larose to Golden Meadow Hurricane Protection Project Levee is designed to protect settlement along Bayou Lafourche, including the communities of Larose and Golden Meadow, from hurricane induced tidal surges. Section D consists of a 3.5 mi (5.6 km) long levee corridor and several associated borrow pits. The project area is located along the West Fork Bayou L'Ours natural levee, and the drained backswamp between West Fork Bayou L'Ours and Bayou Raphael to the south (Figure 1). Section D will complete the hurricane protection project.

The entire 300 ft (91 m) wide Section D levee corridor was tested for archeological resources. The survey was designed to identify and to evaluate all archeological sites and pre-1945 standing structures located within the project area. Archival research focused on the historic development of the general area, and on land tenure history. Collection of archival data was designed to aid in interpreting all identified historic archeological resources, and in assessing their research potential.

Fieldwork consisted of intensive pedestrian survey and systematic shovel testing; approximately 210 acres were surveyed. One archeological site, the previously identified Bayou L'Ours Mounds (16LF54), was located within the project area. Additional shovel testing, auger testing, and test unit excavation at Bayou L'Ours Mounds helped to define the horizontal and vertical extent of the site, and provided data for evaluating the site applying National Register of Historic Places criteria of significance [36 CFR 60.4 (a-d)].

Organization of the Report

Chapter II discusses the geomorphological development of the project area. Chapter III contains a prehistoric overview of the region; Chapter IV discusses the historic development of southern Lafourche Parish, and the land tenure history of the project area. Previous archeological investigations within the project area, and previously recorded archeological sites, are reviewed in Chapter V. Field methods are presented in Chapter VI, and the results of field survey are discussed in Chapter VII. Laboratory analyses of artifacts recovered during site testing at 16LF54 are described in Chapter VIII. A summary and cultural resources management recommendations are presented in Chapter IX.

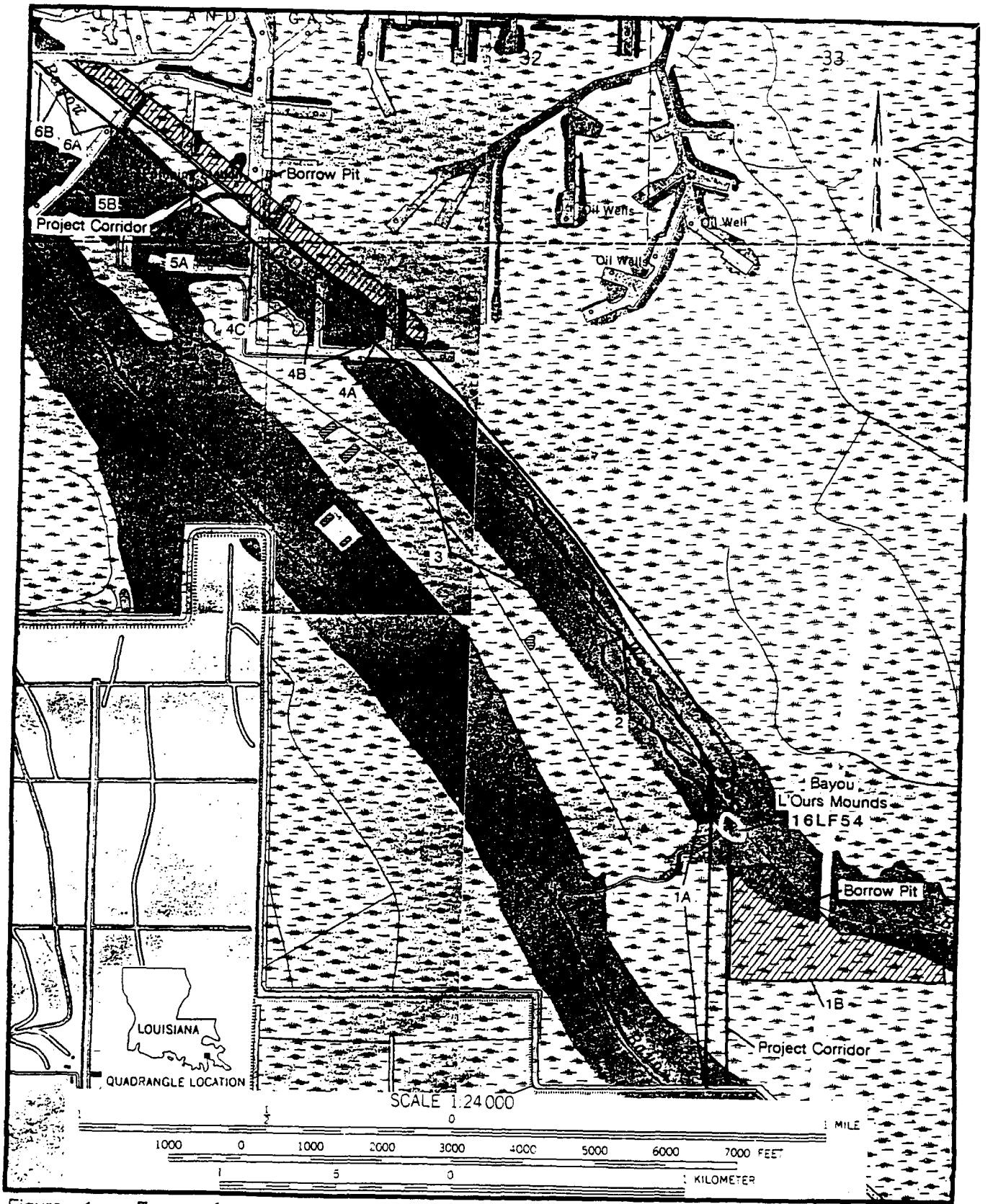


Figure 1. Excerpt from the 1964 (photorevised 1979) Golden Meadow, Louisiana, and the 1956 (photorevised 1979) Golden Meadow Farms, Louisiana U.S.G.S. 7.5' series topographic quadrangles showing the project area and Site 16LF54.

CHAPTER II

NATURAL SETTING

Introduction

This chapter reviews the natural setting of the project area. It examines the distribution of landforms and soils, presents the results of geomorphological field study, and discusses the relationships between geomorphology and the archeological record within the project area. In addition, this chapter examines the climate, flora, and fauna of the project area.

Regional Geology and Geomorphology

Pleistocene History and Geomorphology

During the Late Quaternary period, eustatic sea level fluctuation (between -20 to -70 m) accompanied the accumulation and dissolution of continental ice sheets. Consequently, the Louisiana shoreline migrated north and south across the Continental Shelf by as much as 140 km. Highest sea stands occurred during interglacial periods such as the Holocene and Early Sangamonian stages. The highest sea stand of the Sangamonian stage formed the Ingleside-Pamlico Barrier Island Chain (Suter et al. 1987).

During the Late Wisconsinan stage, nearly 21,000 years ago, sea level dropped by approximately 120 m below current levels. Within the project area, the shoreline moved to a position 40 to 60 km south of the modern shoreline exposing large areas of the continental shelf. Fluvial systems of the Central Louisiana Continental Shelf formed deep valleys; the Mississippi River cut a valley over 100 m deep and 15 to 40 km wide into the continental shelf. This valley follows a northwest to southeast course which extends through Assumption and Terrebonne parishes (Fisk and McFarlan 1955; Morton and Nummedal 1983).

During the latter part of the Wisconsinan stage (approximately 10,000 years ago), sea level rose -30 m (Figure 2). As sea level rose, fluvial, estuarine, and marine sediments filled the Mississippi River Valley. Shoreline migration formed a ravinement surface along the Mississippi River Valley by eroding the upper 7 to 10 m of continental shelf and the upper part of the valley sediment fill (Frazier 1967; Suter et al. 1987).

Mississippi River Deltas

During the Holocene, the Mississippi Delta plain developed from a series of delta complexes. Each delta complex consisted of a cluster of deltas formed by an individual

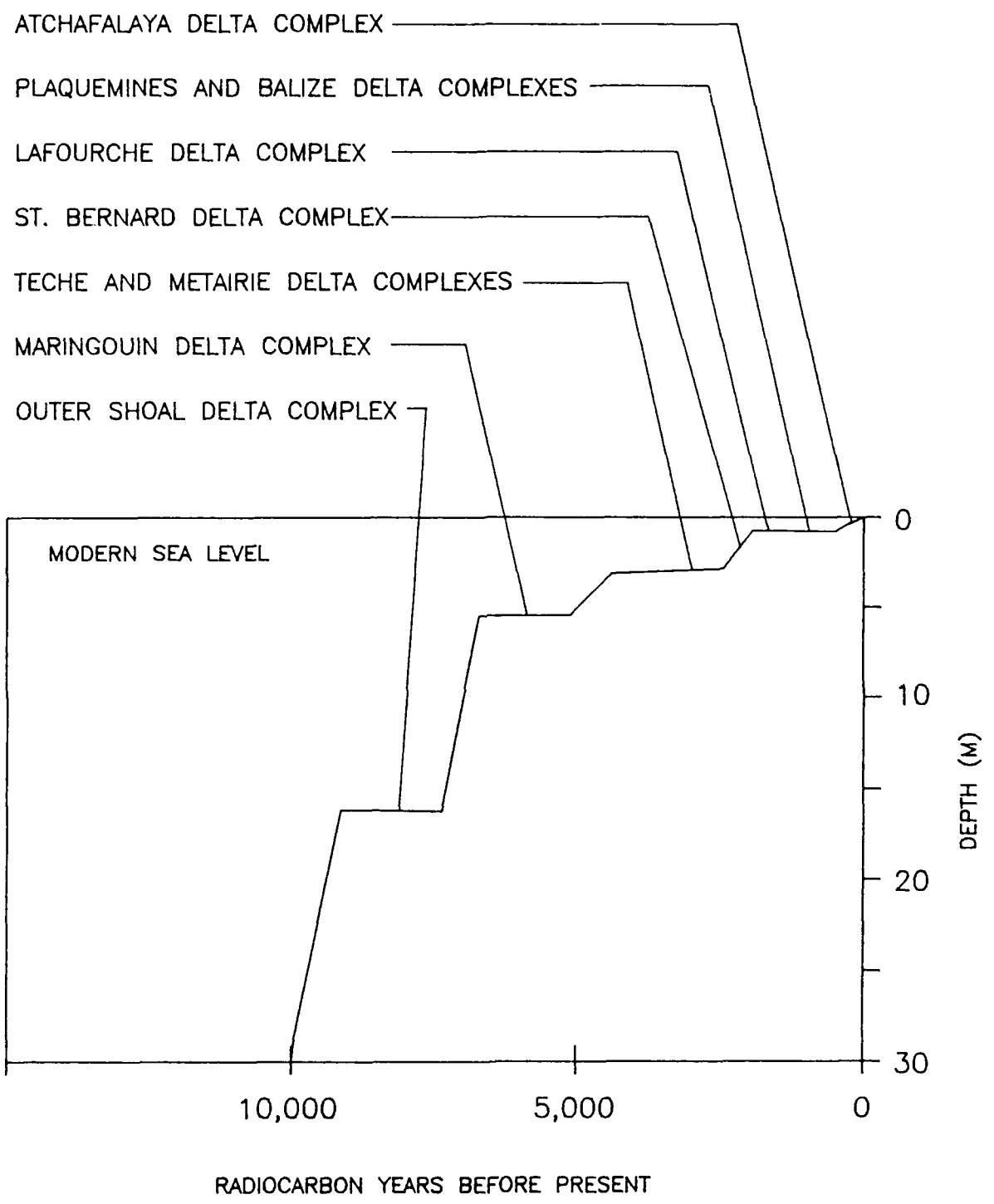


Figure 2. Chronology of delta complexes and relative sea level rise.

course of the Mississippi River. When the Mississippi River abandoned its course, the associated delta complex became inactive since it lost its source of sediment. The river then created a new delta complex at the gulfward end of its new course. If sea level remained unchanged, the active delta complex coalesced with the previous delta complex to form a common geomorphic surface (Frazier 1967, 1974).

The current Mississippi River Delta Plain consists of two delta plains; the Late Holocene delta plain and the Modern delta plain. The Modern delta plain overlaps the Late Holocene delta plain and partially buries it. The delta complexes that form the Late Holocene delta plain overlie an earlier Holocene delta plain (and delta complexes) (Penland et al. 1987, 1988). Frazier (1967, 1974) indicated that the earlier Holocene delta plain is the surface of the Maringouin deltaic complex. Starting about 7,000 years ago, during a period of stable eustatic sea level (Figure 3), the Mississippi River built this delta complex in the area of the Ilses Dernieres.

The Late Holocene delta plain consists of two shelf-phase delta complexes that the Mississippi River constructed between 6,000 and 3,400 years ago. During that time, the Mississippi River formed the Metairie delta complex in southeast Louisiana and the Teche delta complex near and east of Marsh Island (Figure 3). During the development of the Metairie and Teche delta complexes, sea level remained unchanged at a level 6 m below present sea level (Figure 2) (Frazier 1967; Penland et al. 1987, 1988; Weinstein and Gagliano 1984).

From 3,400 to 1,800 years ago, the St. Bernard delta complex prograded gulfward despite a rapid rise in eustatic sea level (Figure 2). The larger of the two delta lobes forming this complex prograded eastward to shape much of St. Bernard Parish. The smaller delta lobe prograded southward from the vicinity of New Orleans to the region occupied by the Barataria Interlobe Basin (Figure 3) (Penland et al. 1987; Frazier 1967).

The Modern delta plain consists of deltaic complexes that formed gulfward approximately 2,500 years ago. Initially, the Mississippi River built the shelf-phase deltas of the Lafourche delta complex south of Donaldsonville. Later, a gradual change in the course of the Mississippi River started the progradation of the shelf-phase Plaquemine delta complex and of the shelf-edge Balize delta southeast of Belle Chase (Figure 3). A partial diversion of the Mississippi River down the Atchafalaya River prompted the formation of the Atchafalaya delta complex (Penland et al. 1987; Weinstein and Gagliano 1984).

During the deposition of the Modern delta plain, eustatic sea level remained at its present level. However, relative sea level continued to rise, mainly in response to compactional subsidence. This rate of relative sea level rise varies from 30 to 60 cm, depending on the thickness, composition, and age of the underlying sediments (Penland et al. 1988).

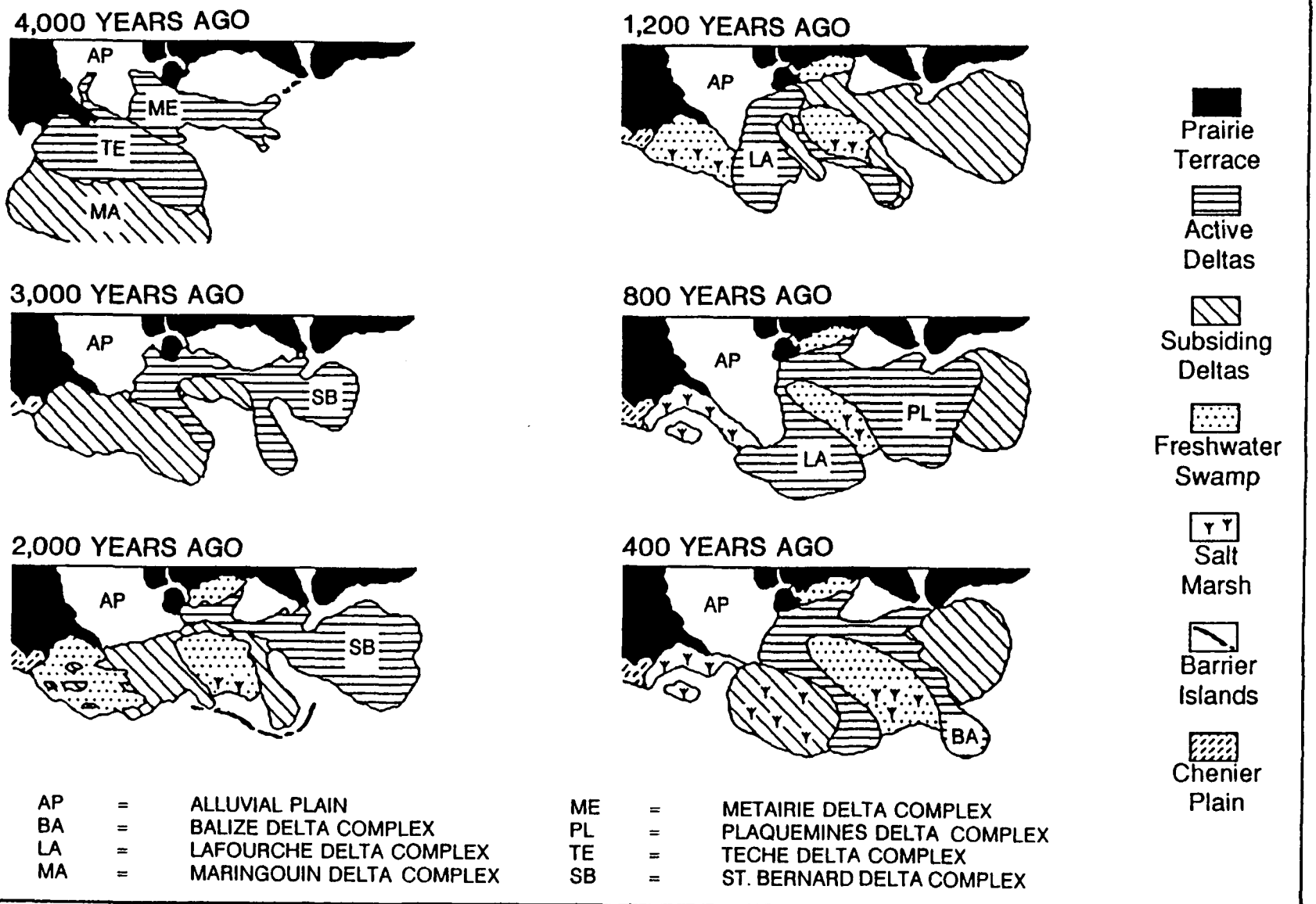


Figure 3. Paleogeography of the Mississippi River Delta.

Terrebonne Coastal Region

The project area lies within the Terrebonne coastal region which includes Assumption, Terrebonne, and Lafourche Parishes (Figure 4). The abandoned distributaries of the Teche delta complex dominate the northeastern half of this region. These abandoned distributaries radiate southeast from Bayou Teche at Morgan City until they disappear underneath the Modern delta plain. Three to 5 m of marsh and bay deposits underlie Late Holocene delta plain surficial deposits. The Lafourche delta complex occupies the southeastern half of this region. Its distributary ridges radiate southeast from Houma and disappear beneath freshwater marshes or end near barrier island systems. Because the Modern deltaic plain subsided less (relative to present sea level) than the Late Holocene deltaic plain, only 1 to 2 m of marsh and bay deposits accumulated on the surface of the Lafourche delta (Figure 4) (Penland et al. 1987, 1988; Weinstein and Gagliano 1984).

Within the Lake Perchant Quadrangle, a series of low shell ridges have been interpreted by researchers such as McIntire (1958), Penland et al. (1987), Smith et al. (1986), and Weinstein and Gagliano (1984) as a relict, transgressive shoreline of varying significance (Figure 4). Penland et al. (1987) imply that these shell ridges comprise part of a significant transgressive shoreline called the Teche shoreline. This shoreline, they hypothesize, truncates the Teche delta complex of the Late Holocene delta plain, thereby separating it from the younger Modern delta plain. Therefore, these ridges represent the edge of a shoreline that moved inland by as much as 40 km, eroding a "ravinement surface" across the surface of the Late Holocene delta plain.

More recent studies in the Lake Perchant area indicate that these shell ridges represent shell middens (CEI 1989). The shell middens measure up to 6 m thick and contain Marksville and younger pottery types within their exposed portions. Tchula and Poverty Point sites occur on a submerged, but intact, distributary ridge southeast of the so-called "Teche Shoreline" as defined by Penland et al. (1988, 1989). The origin, thickness, and dates of 5,930 and 6,682 years ago for the reworked shell that is overlying and associated with the Teche shoreline all indicate that the former model may require significant revision.

Barataria Interlobe Basin

The project area lies on the western edge of the Barataria Interlobe Basin. This basin formed approximately 2,000 years ago with the progradation of the Lafourche delta complex south into the project area and with the later development of the Plaquemine deltaic complex (Figure 3). This basin served as a valuable source of faunal and floral resources for the area's prehistoric inhabitants. Since its formation 2,000 years ago, the configuration, sedimentary environment, fauna, and flora of the Barataria Interlobe Basin continue to change (Kosters 1987, 1989; Kosters et al. 1983).

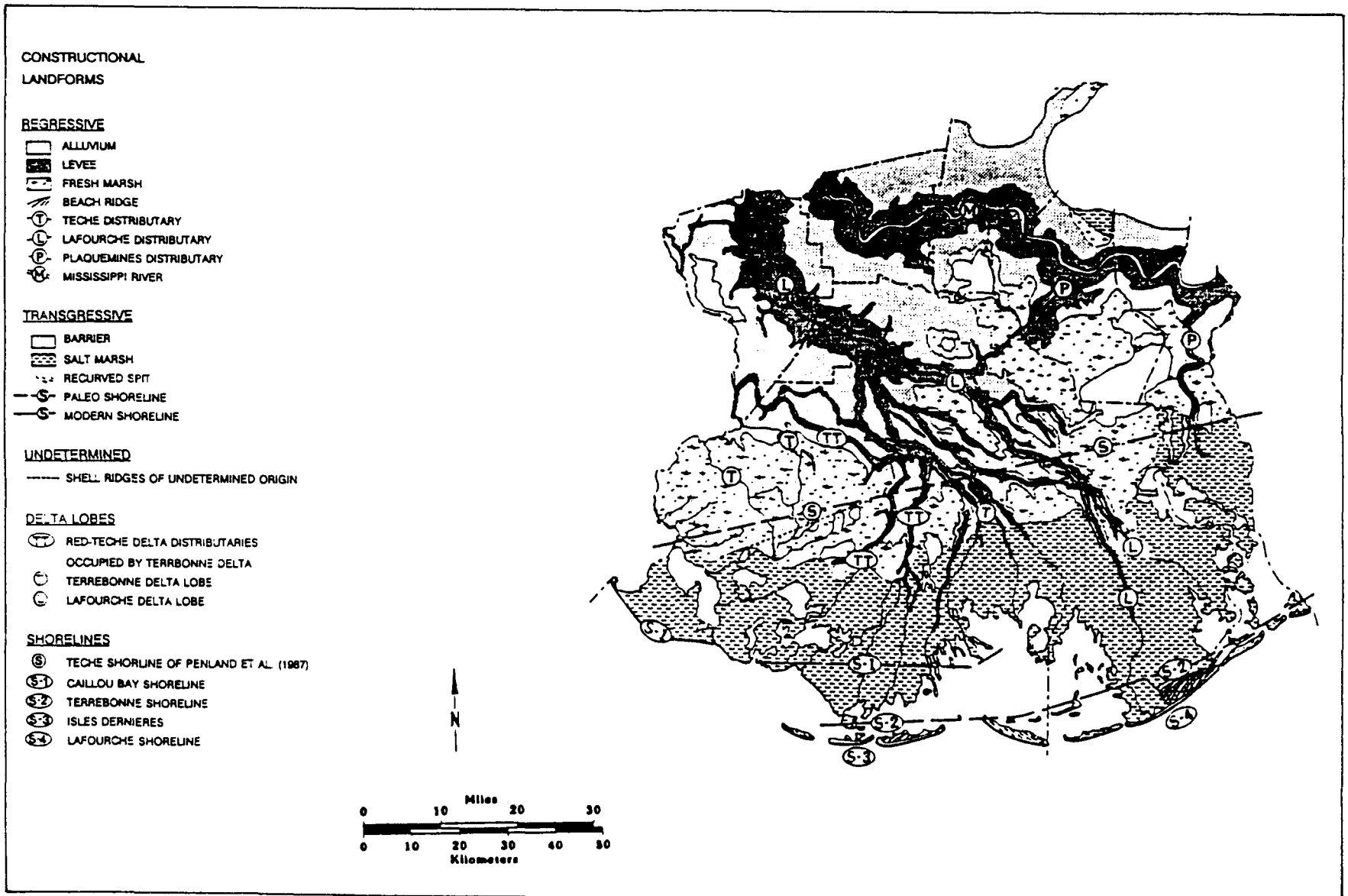


Figure 4. Geomorphology of Terrebonne Coastal Region.

Project Area Investigations

A preliminary definition and delineation of the geomorphic features within the project area were accomplished through the examination and analysis of aerial photographs and of existing studies. Geomorphic features observed from USDA Agricultural Stabilization and Conservation Service (ASCS) aerial photography (flown in 1941 and 1953) of Lafourche Parish were plotted on 7.5' U.S.G.S. (1:24,000 scale) topographic maps and on copies of sheets from Matthews (1984). The geomorphological features were observed primarily on the 1941 aerials, while the 1953 aerials were used to locate features on topographic maps and soil survey sheets.

In addition to literature review and analysis of aerial photographs, a limited amount of fieldwork was conducted within the project area. Fieldwork consisted of a general visual examination of the project area, and of the excavation of three backhoe trenches and two auger tests. Stratigraphic profiles of the auger tests and the backhoe trenches are contained elsewhere in this report (Appendix II.)

Three backhoe trenches were excavated adjacent to the Bayou L'Ours Mound site (16LF54). The first two trenches, Trenches 1 and 2, were located on a small crevasse distributary that extends west from the natural levee at 16LF54. The trenches were placed along the crevasse in order to examine its internal stratigraphy, as well as to recover datable material from the crevasse. The third backhoe trench (Trench 3) cut through the crest of the natural levee of the distributary ridge on the left descending bank directly across from 16LF54. Shallow groundwater impeded excavation of the third backhoe trench, which was located closer to the marsh-natural levee interface.

Geomorphology of the Project Area

The project area included a 4.6 km length of West Fork Bayou L'Ours, one of several relict distributaries of the Lafourche delta complex within the immediate vicinity of the project area (Figure 5). The 2.4 km long ridge segment situated immediately northwest of 16LF54 remains relatively undisturbed. In addition, it represents a typical deltaic distributary ridge. Within this segment, the ridge measures 200 to 300 m wide and about 1 m high. Late Holocene subsidence rates suggest that this ridge probably measured 2 m higher at the time this distributary was active. The natural levee and crevasse deposits exposed in Backhoe Trenches 1, 2, and 3 have been strongly modified by pedogenic and biologic processes, so that primary stratification and sedimentary structures were obscured. Otherwise, the ridge consists of typical natural levee and crevasse deposits. Organic and clastic sediments eventually filled the abandoned distributary channel to the point where its bottom is exposed during periods of dry weather.

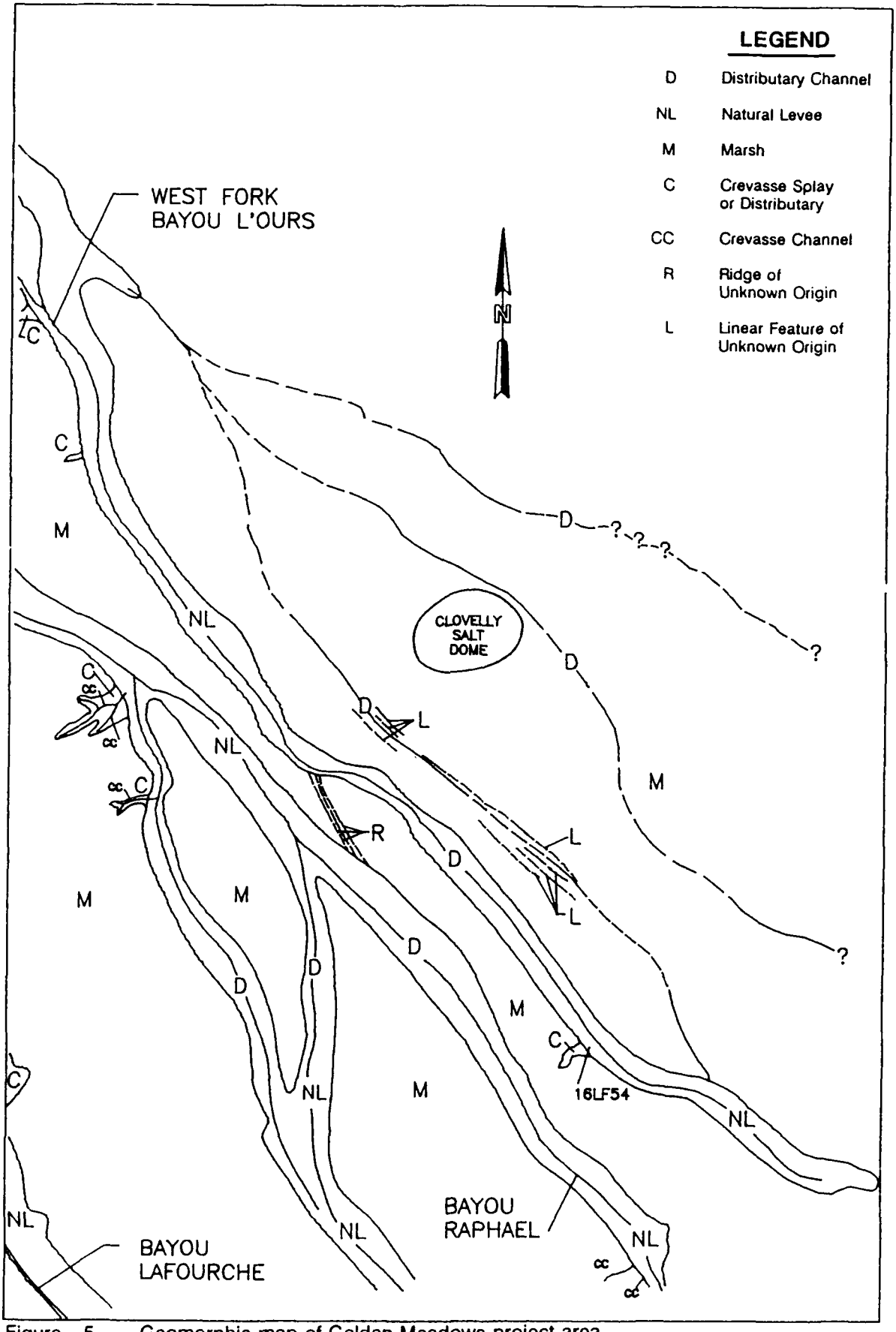


Figure 5. Geomorphic map of Golden Meadows project area.

The development of the Clovelly Oil Field and construction of the Loop, Inc. facility severely disturbed the northern 2.2 km of the distributary ridge within the project area. Canals and pipelines constructed through the distributary ridge also destroyed significant sections of the feature. Enlargement of canals by erosion further contributed to the destruction of the distributary ridge. In addition, this segment of West Fork Bayou L'Ours subsided considerably more than the undisturbed segment that lies to the south. Because this part of the distributary ridge lies within the Clovelly Oil Field, the anomalous subsidence may reflect local subsidence caused by oil production within this field.

Data from Walker & Avery, Inc. (1989) depict the subsurface stratigraphy of the survey area. Beneath the crest of the natural levees of West Fork Bayou L'Ours, the natural levee sediments measure 3 to 4 m thick. The natural levee clays rest upon distributary channel and mouth bar silts and sands that range in thickness from 3 to 5 m. The sediments of both facies become thinner and pinch out away from the center of West Fork Bayou L'Ours. A comparison of Walker & Avery, Inc. (1989) data with Kosters' (1987) Cross Section G suggests that the 3 to 5 m of clay and sandy clay with abundant shells that underlie the distributary sediments probably represent materials which accumulated within an open bay. The depositional environment of the sediments beneath the open bay deposits has not been examined because of a lack of necessary data.

Penland et al. (1987, 1988) consider West Fork Bayou L'Ours to be a distributary of their Bayou Terrebonne delta which formed between 1,270 to 830 years ago. Therefore, if their hypothesis is correct, the West Fork Bayou L'Ours must have formed the Bayou Terrebonne delta. The presence of a possible Marksville component at 16LF54 suggests that this model significantly underestimates the age of this distributary system.

In contrast, Weinstein and Gagliano (1984) consider West Fork Bayou L'Ours to be a delta lobe of the Lafourche delta complex which advanced southward across the uneroded Late Holocene delta plain of the Teche delta complex from 2,000 to 1,600 years ago. They place the shoreline at least 25 km south of the project area. West Fork Bayou L'Ours reached this shoreline and functioned as a minor distributary of the Lafourche delta complex for the next 700 years. Their model is consistent with the age of known sites on the West Fork Bayou L'Ours distributary system.

Both crevasse splays and distributaries occur along West Fork Bayou L'Ours (Figure 5). Within the project area, 16LF54 lies at the junction of a prominent crevasse distributary and the West Fork of Bayou L'Ours. Archeological sites commonly occur at such junctions throughout the Mississippi River delta plain (Goodwin, Yakubik et al. 1985).

The channel that borders the northern edge of the Bayou L'Ours site appears to be a man-made feature, pre-dating 1941. The geometry of the channel does not resemble that of a crevasse, and the channel lacks a crevasse splay or a distributary at its mouth; both are typical crevasse features. In addition, auger tests failed to find any

recognizable channel deposits (Appendix II). The channel appears on the 1941 and 1953 aerial photographs of the site area.

Project Area Soils

Two soil associations, the Fausse-Sharky association and the Lafitte-Clovelly association, occur within the project area. Fausse-Sharky association soils developed within the natural levees of West Fork Bayou L'Ours; Lafitte-Clovelly association soils occur within the marsh adjacent to the distributary ridges. Immediately to the north of the project area, the Fausse-Sharky association grades into Sharky clay as drainage of the distributary increases with elevation (Matthews 1984).

Typically, the surface layer of the Sharky soil of the Fausse-Sharky association consists of a very dark gray, slightly acid clay about 15 cm thick. Its subsoil generally consists of approximately 90 cm of gray and dark gray, mottled clay that is mildly alkaline within its upper part and moderately alkaline within its lower part. Sharky soil has a high shrink-swell potential. When dry, it can develop cracks that are 2 cm or more wide to a depth of 50 cm (Matthews 1984).

Typically, the surface layer of the Fausse soil of the Fausse-Sharky association consists of a dark grayish brown, slightly acid clay approximately 10 cm thick. Its subsoil generally consists of 85 cm of dark gray, mottled clay. The clay is neutral within the upper part and moderately alkaline within its lower part. Although seldom dry enough to crack, Fausse soil has a high shrink-swell potential (Matthews 1984).

The slightly acid surface layer of the Fausse and Sharky soils effects the preservation of faunal materials throughout the project area. The occurrence of both well preserved and corroded shell at 16LF54 indicates that differential preservation occurs within these soils because of the low permeability and slight acidity of their surface layer. The better preserved shells probably occur within large shell concentrations, because the dissolution of just a very small amount of the total mass of shell would neutralize soil acidity. The low permeability would inhibit the movement of dissolved carbonate and serve to maintain an alkaline or neutral environment around large concentrations of shell. In contrast, the scattered shells would be more corroded, since an insufficient amount of shell carbonate is present to counteract the acidity of the soil. For similar reasons, the degree or lack of preservation of bone should be related to the amount of shell associated with it.

The high shrink-swell potential of the Fausse and Sharky soils also could have affected the integrity of sites within the project area. Soils with high shrink-swell potential are prone to churning by argilliturbation if subjected to repeated wetting and drying (Wood and Johnson 1978). Currently, the shallow water table within the project area probably inhibits significant churning of these soils by limiting the degree to which the soils can dry. Because subsidence lowered the elevation of the natural levees within the project area,

the water table probably was lower; only limited argilliturbation possibly occurred during the past.

The Lafitte-Clovelly association consists of level, very poorly drained, semifluid, organic soils. These soils occur within the broad interdistributary marshes that remain flooded most of the time. The Lafitte soil, which typically consists of approximately 190 cm of dark grayish brown to black semifluid muck overlying semifluid gray clay, occurs within the center of the interdistributary marshes. Clovelly soil, which typically consists of approximately 90 cm of dark grayish brown to black semifluid muck overlying semifluid gray clay, occurs along the edges of the interdistributary marshes. Clovelly soil represents marsh that covered the natural levees of distributary ridges as they subsided (Matthews 1984).

The Lafitte-Clovelly association includes small, unmapped patches of developed silt loam and clay silt. These unmapped, Vacherie-like soils developed within small crevasse splays adjacent to 16LF54.

Adjacent Distributary Systems

An examination of aerial photography indicates that an unnamed branch of West Fork Bayou L'Ours' distributary system lies just northeast of the project area (Figure 5). The three branches of this distributary system appear only on aerial photography; subsidence practically buried these features in a manner illustrated by Fisk (1960). The similarity in the extent to which it and the Des Amoreux distributary sank into the marsh implies that both were abandoned within a short time of each other, although the exact time is unknown. This distributary system probably represents one of many small distributary systems such as Bayou Des Amoreux and Kings Ridge; these distributary systems were active as the Lafourche delta complex prograded through the study region (Weinstein and Gagliano 1984).

The adjacent Bayou Lafourche constitutes the primary distributary of a delta lobe of the Lafourche delta complex. Although its flow began to wane about 1,000 years ago, Bayou Lafourche continued to carry a significant flow of water and sediment until it was artificially closed at Donaldsonville in 1904 (Weinstein and Gagliano 1984). The large size of both its channel and its natural levee relative to the channels and natural levees found along West Fork Bayou L'Ours indicate the continuous activity of Bayou Lafourche.

Older Holocene and Late Pleistocene Sediments

A regional study by Kolb and Van Lopik (1958) suggests that the sediments composing the Lafourche delta complex represent only the upper part of approximately 61 m (200 ft) of Holocene deltaic sediments found within the project area. These sediments lie above the weathered, and presumably deeply eroded, continental shelf exposed during the Late Wisconsinan stage. To the west, Kolb and Van Lopik (1958)

infer that a buried, entrenched valley occurs adjacent to the project area. Any fluvial and estuarine sediments that fill this valley might contain the only Late Pleistocene archeological deposits that escaped destruction by the transgression of the shoreline across the project area.

Structural Influence on Geomorphology

Within the project area, the 1941 SCS aerial photographs show anomalous distributary ridge patterns (Figure 5). The central and northernmost ridges of the unnamed distributary diverge from the typical radiating pattern within Sections 29, 30, 31, and 32 of R22E, T18S. Immediately to the east, the central ridge abruptly changes course and converges with the southernmost ridge of the unnamed distributary. Also within Section 31, three distributary ridges, West Fork Bayou L'Ours, Bayou Raphael, and the southernmost ridge, all converge and then diverge anomalously. The ridges of the unnamed distributary are clearly defined within Sections 32 and 29, but become indistinct to the east and west.

The convergence and divergence of these distributary ridges indicate the diversion of these ridges around a central point in the northern half of Section 32 of R22E, T18S that is underlain by the Clovelly Salt Dome. The caprock of the salt dome has risen to a depth of only 119 m (389 ft) below mean sea level (New Orleans Geological Society 1960) (Figure 5). The Clovelly Salt Dome affected adjacent distributary ridges by impeding their subsidence, or by uplifting the delta plain that lies immediately above it. In either case, the prograding distributary systems preferentially prograded around the high portion of the deltaic plain over the Clovelly Salt Dome.

Climate

The project area is characterized by a humid, subtropical climate with long, hot summers and short, mild winters (United States Department of Agriculture, Soil Conservation Service [USDA, SCS] 1984). Average daily maximum temperatures generally exceed 88° Fahrenheit from June through August each year; however, temperatures seldom exceed 100° Fahrenheit, because of the cooling Gulf breezes. The highest average daily maximum temperature for New Orleans, 90.4° Fahrenheit, occurs during the month of July. The recorded high temperature of 98° Fahrenheit occurred on June 27, 1967. The average annual maximum temperature for New Orleans is 77.4° Fahrenheit; the average annual minimum temperature is 58.5° Fahrenheit. Winter months remain relatively mild. The recorded low is 14° Fahrenheit; this record was set in New Orleans on January 24, 1963. The lowest average daily minimum temperature of 42.6° Fahrenheit occurs in January (USDA, SCS 1984).

The area receives an abundance of precipitation throughout the year. Average precipitation exceeds 6 in from July through September. Thunderstorms occur most

frequently during summer months. October, which is the driest month, receives 2.84 in of precipitation on average; the wettest month, September, receives an average of 6.32 in of rainfall. Snowfall is a rare occurrence (USDA, SCS 1984). Hurricanes pose a threat to the region during summer and fall.

Flora and Fauna

The project area consists of nonwetlands (natural levee), a hardwoods interarea (a transitional zone between wetland and nonwetland), and wetlands (backswamp and freshwater marsh). Nonwetlands and the hardwood interarea support a greater variety of vegetation and animal species than the wetlands environment. Hardwoods that comprise the nonwetlands and the hardwood interarea include live oaks (*Quercus virginiana*), mayhaw (*Crataegus opaca*), hackberry (*Celtis laevigata*), bitter pecan (*Carya aquatica*), pawpaw (*Asimina triloba*), and sweetgum (*Liquidambar styriciflua*). Plant understory includes palmetto (*Sabal minor*), bedstraw (*Galium aparine*), yaupon (*Ilex vomitoria*), trumpet creeper (*Campsis radicans*), muscadine (*Vitis rotundifolia*), maypop (*Passiflora incarnata*), switchcane (*Arundinaria tecta*), pokeweed (*Phytolacca americana*), and blackberry (*Rubus* sp.). Groundcover including various sedges and grasses are found along natural levees (Brown 1980; Goodwin, Yakubik et al. 1985).

The wet hardwood interarea and natural levees serve as habitat for mammals such as white-tailed deer (*Odocoileus virginianus louisianae*), eastern cottontail (*Sylvilagus floridanus*), eastern wood rat (*Neotoma floridana*), southern flying squirrel (*Glaucomys volans*), fox squirrel (*Sciuris niger*), northern raccoon (*Procyon lotor*), American black bear (Ursus *americanus*), evening bat (*Nycticeius humeralis*), red bat (*Lasiurus borealis*), and marsh rice rat (*Oryzymus palustris*). Birds include painted bunting (*Passerina cirris*), red-winged blackbird (*Agelaius phoenicews*), common crow (*Corvus brachyrhynchos*), common night hawk (*Chordeiles minor*), screech owl (*Otus asio*), black vulture (*Coragyps atratus*), and turkey vulture (*Cathartes aura*). Reptiles and amphibians include canebrake rattlesnake (*Crotalus horridus*), cottonmouth, slender glass lizard (*Ophisaurus attenuatus*), ground skink (*Scincella laterale*). Crustacean species consist of red swamp crawfish and white or river crawfish (*Procambarus blandingii*) (Harper and Row 1981).

Backswamp vegetation includes more water-adaptive plants. Tupelogum (*Nyssa aquatica*), baldcypress (*Taxodium distichum*), Virginia willow (*Itea virginica*), and buttonbush (*Cephalanthus occidentalis*) compose the overstory in the backswamp zone. Plant understory includes alligator weed (*Alternanthera philoxeroides*), fan wort (*Cabomba caroliniana*), swamp lily (*Crinum americanum*), wild iris (*Iris* sp.), royal fern (*Osmunda regalis*), dotted smartweed (*Polygonum punctatum*), and burreed (*Sparganium americanum*) (Brown 1980). Freshwater marsh consists primarily of water tolerant grasses.

Animals that inhabit the wetland zones include mammals such as white-tailed deer, swamp rabbit (*Sylvilagus aquaticus*), beaver (*Castor canadensis),* muskrat *Ondatra zibethicus)*, striped skunk (*Mephitis*), Virginia opossum (*Didelphis virginiana*), North American mink (*Mustela vison*), bobcat (*Lynx rufus*), gray squirrel (*Sciurus carolinensis*), river otter (*Lutra canadensis),* and nutria (*Myocastor coypus*). Bird species include great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), little blue heron (*Florida caerulea*), snowy egret (*Egretta thula*), bald eagle (*Maliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), barred owl (*Strix varia*), great horned owl (*Bubo virginianus*), and pileated woodpecker (*Dryocopus pileatus*). In addition, the red swamp crawfish thrives in backswamp areas (Gibson et al. 1978).

Aquatic fauna found in the vicinity of the project area includes mammals such as river otter (*Lutra canadensis*), beaver (*Castor canadensis*), and muskrat (*Ondatra zibethicus*). Aquatic birds include wood duck (*Aix sponsa*), common teal (*Anas crecca*), mallard (*Anas platyrhynchos*), killdeer (*Charadrius vociferus*), bank swallow (*Riparia*), belted kingfisher (*Meaceryle alcyon*), and sandpiper (*Bartramia longicauda*). Reptiles and amphibians include newt (*Diemictylus viridescens*), Gulf Coast toad (*Bufo valliceps*), bull frog (*Rana catesbeiana*), leopard frog (*Rana grylio*), gray treefrog (*Hyla versicolor*), American alligator (*Alligator mississippiensis*), common snapping turtle (*Chelydra serpentina*), stinkpot (*Sternothaerus carinatus*), box turtle (*Terrapene carolina*), painted turtle (*Chrysemys picta*), green anole (*Anolis carolinensis*), mud snake (*Farancia abucura*), copperhead (*Agkistrodon contortrix*), common king snake (*Lampropeltis getulus*), cottonmouth (*Agkistrodon piscivorus*), rat snake (*Elaphe obsoleta*), green water snake (*Natrix cyclopion*), and banded water snake (*Natrix fasciata*). Fish include paddlefish (*Polydon spathula*), alligator gar (*Lepisosteus spatula*), bowfin (*Amia calva*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), yellow bass (*Morone mississippiensis*), largemouth bass (*Micropterus salmoides*), spotted sunfish (*Lepomis punctatus*), red ear sunfish (*Lepomis microlophus*), crappie (*Pomoxis* sp.), and freshwater drum (*Aplodinotus grunniens*). Mussels and snails include marsh periwinkle (*Littornia irrorata*), freshwater snail (*Physa* sp.), brackish water clam (*Rangia cuneata*), fresh-water clam (*Anodata* sp.), freshwater mussel (*Mytilopsis leucopuaeta*), and ribbed mussel (*Modiolus demissus*). Crustaceans include river crawfish (*Procambarus blandingii*), red swamp crawfish (*Procambarus clarkii*), river shrimp (*Macrobrachium ohione*), blue crab (*Callinectes sapidus*), and mud crab (*Rithropenopeus harrisii*) (Harper and Row 1981).

Archeological Geology of Project Area

As sea level rose during the Late Wisconsinan stage and Early Holocene epoch, the landward migration of the shoreface eroded the upper 7 to 10 m of the coastal plain. This depth of erosion probably destroyed any archeological deposits on the uplands of the former coastal plains. Because the top of the fluvial sediments within the valley fill of the Mississippi River occur at depths greater than 10 m, the archeological deposits buried within the fill of the Mississippi River Valley probably survived erosion of the ravinement

surface. During later sea level stands within the Holocene, deltaic sediments buried the ravinement surface and the surviving valley fill under Holocene marine and deltaic sediments. As a result, any surviving archeological deposits related to the initial occupation of south-central Louisiana are buried beneath tens of meters of sediment (Pearson et al. 1986; Suter et al. 1987).

There is a potential for encountering buried sites within the project area. A review of current archeological data found that the lack of a well-defined transgressive shoreline and the distribution of archeological sites indicate that a transgressive shoreline did not erode the Late Holocene delta plain prior to the deposition of the Lafourche delta complex as proposed by Penland et al. (1987, 1988). Instead, the Lafourche delta complex buried the Late Holocene delta plain relatively intact as proposed by Weinstein and Gagliano (1984). Thus, the natural levees of distributary systems on the Late Holocene deltaic plan and the archeological deposits that they may contain remain intact (Smith et al. 1986).

Conclusions

From the previous discussion, the following conclusions can be made. West Fork Bayou L'Ours formed about 2,000 to 1,600 years ago, as a distributary of a prograding Lafourche delta of the Lafourche delta complex. This distributary has been inactive for at least the last 1,000 years. West Fork Bayou L'Ours is a typical example of a minor deltaic distributary ridge. The Clovelly Salt Dome has either actively or passively altered the course of the distributary systems located within the vicinity of the project area. Pedogenic and biologic processes strongly modified the sediments that compose the natural levee, the crevasse splays, and the distributaries associated with West Fork Bayou L'Ours. The physical characteristics of soils within the project area might result in the selective preservation of both bone and shell and argilliturbation of the matrix (and buried artifacts). Like any other natural levee deposit, these sediments also were disturbed by bioturbation. The Bayou L'Ours Site, 16LF54, lies at the junction of the natural levee with a prominent crevasse distributary. The upper 2.2 km segment of the West Fork of Bayou L'Ours within the project area has been disturbed significantly by the development of the Clovelly Oil Field and the Loop, Inc. facility. The remaining 2.4 km remain relatively undisturbed. The channel that cuts across the north edge of 16LF54 is a man-made feature. It apparently was cut prior to 1941.

CHAPTER III

PREHISTORIC SETTING

Introduction

Louisiana's prehistoric development dates from the Paleo-Indian stage ca. 10,000 B.C., to the early historic contact period, ca. A.D. 1700. Within the South Louisiana deltaic plain, however, initial aboriginal settlement varied from deltaic lobe to deltaic lobe, and from tributary to tributary, depending on the age of the formations. As discussed in Chapter II, the current study area was formed no earlier than 1,600 to 2,000 years ago. Therefore, the earliest anticipated sites within the study area would date from the Marksville period (A.D. 100-A.D. 400). The following review of the study area's prehistoric setting begins with the Marksville period, a part of the Neo-Indian age, and extends through the Mississippi period (A.D. 1000-A.D. 1700). Information about earlier occupation within Louisiana is available elsewhere (Webb, Shriner et al. 1971; Muller 1983; Neuman 1984; Smith et al. 1983; Neitzel and Perry 1978; Ford and Quimby 1945; Jenkins 1974; Walthall 1980; and, Marshall 1973).

Marksville Culture (A.D. 100-A.D. 400)

The Marksville culture is named for the type site, Marksville (16AV1), in Avoyelles Parish, Louisiana. The period represents a regional (Lower Mississippi Valley) hybridization of the earlier Midwestern Hopewellian culture climax (Toth 1977). Similarities between Marksville and Hopewellian cultures include burial mound construction, burial practices, and pottery decorative techniques. These similarities are so great that some archeologists suggested that the Hopewellians relocated from the Midwest into the Lower Mississippi Valley (Muller 1983). The Marksville culture is characterized by a resurgence in extended trade networks for prestige items, and by an intensification of mortuary rituals (Cantley et al. 1984). While large quantities of grave goods are not common at Marksville sites, some items, including elaborately decorated ceramics, were manufactured primarily for inclusion within burials. Other grave goods include pearl beads, carved stone effigy pipes, copper ear spools, copper tubes, carved coal objects, and galena beads. Mortuary practices declined towards the end of the Marksville period, as Hopewellian influence abated (Smith et al. 1983).

A number of similar ceramic decorative techniques occur commonly on both Hopewellian and early Marksville pottery. These include cross-hatching, U-shaped incised lines, zoned dentate rocker stamping, cord wrapped stick impressions, stylized birds, and bisected circle motifs. As the Marksville culture waned, however, the decorative techniques changed; several of the earlier decorative techniques were replaced by other motifs and combinations (Smith et al. 1983). Some pottery types common to Marksville

culture include Marksville Incised, Marksville Stamped, Baytown Plain *var. Marksville* (formerly Marksville Plain), and Catahoula Zoned Red (formerly Marksville Red Filmed) (Phillips 1970; Ford and Willey 1940).

In addition to the distinctive pottery types, Marksville artifact assemblages included a chipped stone assemblage of knives, scrapers, celts, and drills; ground stone atlatl weights and plummets; bone awls and fishhooks; baked clay objects; and medium to large stemmed projectile points. Exotic items diagnostic of Marksville culture include imported copper earspools, panpipes, platform pipes, figurines, and beads (Neuman 1984; Smith et al. 1983).

Marksville settlements in the region generally are located along the natural levees of rivers and distributary channels, and along Mississippi River Valley floodplain lakes. The Marksville economy was based on a hunting, fishing, and gathering subsistence strategy. Initial use of maize, primarily as a dietary supplement (as opposed to a staple), possibly occurred during this time (Walthall 1980; Struever and Vickery 1973). A fairly complex social system helped sustain elaborate construction and mortuary practices.

Troyville-Coles Creek Culture (A.D. 300-A.D. 1100)

Troyville culture, known as Baytown outside of Louisiana, was named after the largely destroyed Troyville mound group (16CT7) in Jonesville, Louisiana. Troyville emerged around A.D. 300 out of the declining Marksville culture, and it formed a 400 year transitional period which culminated with Coles Creek culture, around A.D.700 (Smith et al. 1983). The similarities between Troyville and Coles Creek warrant their study as a single unit of Louisiana prehistory (Neuman 1984; Belmont 1967; Smith et al. 1983). The significant developments of the bow and arrow, and agriculture occurred during the Troyville period, radically altering prehistoric lifeways. The widespread use of maize, bean, and squash as economic staples contributed to the development of more complex settlement patterns and social organizations during Troyville and subsequent periods. Platform (temple) mounds and large ceremonial buildings were constructed, suggesting the emergence of a priestly social class, and the existence of a sturdy economic base (Smith et al. 1983).

The size and number of Troyville-Coles Creek sites increased substantially compared to earlier periods, suggesting a relatively large population increase. Use of the bow and arrow, and agricultural development probably bolstered the economic base. The widespread use of agriculture as an economic staple promoted increased sedentism and community autonomy. Use of the bow and arrow also resulted in a reliance on smaller mammals (Gibson et al. 1978).

Troyville-Coles Creek sites generally contain one or more mounds. These mounds typically are characterized as large, flat-topped pyramidal mounds; in multiple mound

sites, they often surround an open plaza. Troyville-Coles Creek mounds normally are larger than Marksville mounds, and exhibit more building episodes. While burials occasionally are recovered from Troyville-Coles Creek mounds, they primarily served as ceremonial mounds, upon which were constructed wattle and daub structures, or "temples." Low, narrow causeways connected the mounds at some sites. Smaller sites, including hamlets and shell middens, normally do not contain mounds. Troyville-Coles Creek sites found within the coastal region often consist of shell middens along higher portions of natural levees. These areas were well adapted for exploitation of the surrounding natural resources (Neuman 1984; Smith et al. 1983).

Troyville pottery was influenced by both central Mississippi and Florida Gulf Coast ceramic traditions. The influence from central Mississippi included increased amounts of plain pottery, and a decoration preference of cord marking and red filming. The Florida Gulf Coast influence consisted of simplified zoned rocker stamping, incised lines, and curvilinear motifs (Smith et al. 1983). Pottery types common to the Troyville culture, but not restricted to it, included Larto Red, Quafalorma Red and White, Baytown Plain, Evansville Punctated, and Churupa Punctated. McIntire (1958) noted that many of the decorative techniques commonly associated with Troyville continued, and were elaborated on, during Coles Creek and beyond. For example, the Churupa Punctate and the Mazique Incised designs, both of which characterize Troyville culture, also were used by Coles Creek and Plaquemine pottery makers (McIntire 1958:76). Similarly, French Fork Incised, which formed the basis for many Troyville classifications, continued in use well into Coles Creek times (Phillips 1970). Troyville pottery vessels generally are larger than Marksville vessels, which probably reflects the increased use of pottery for grain storage.

The craftsmanship of Coles Creek pottery generally exceeds that of Troyville pottery; Coles Creek potters utilized a wider variety of decorative techniques than their Troyville counterparts. Coles Creek Incised, which consists of a series of incised lines under the rim of the vessel, often accompanied underneath by a row of triangular impressions, is predominantly a Coles Creek ware. Other wares commonly recovered from Coles Creek sites include Baytown Plain, Evansville Punctated, Avoyelles Punctated *var. Avoyelles*, and French Fork Incised (Phillips 1970). Within coastal Louisiana, differentiation between Troyville wares and Coles Creek wares is complicated by the scant recovery of key marker types. Rather, Troyville-Coles Creek sites normally contain a variety of pottery that spans the entire period (Gibson 1982).

Plaquemine Culture (A.D. 1100-A.D. 1700)

Within the Lower Mississippi Valley, the Plaquemine culture emerged out of Coles Creek culture around A.D. 1100. Plaquemine culture was defined at the Medora site (16WBR1), south of Baton Rouge (Quimby 1951). Agricultural practices, socio-political structure, and religious ceremonialism intensified during this time. Types of sites associated with the culture include ceremonial centers, often with multiple mounds

surrounding a plaza; satellite communities, including villages, hamlets, campsites, and coastal shell middens surrounded these ceremonial centers. The economic system was based on agriculture, supplemented with hunting and gathering (Quimby 1951; Smith et al. 1983).

Plaquemine ceramics were derived from the Coles Creek tradition, but they exhibited distinctive decorative techniques. Vessel shapes, tempering, and pastes resembled those associated with Coles Creek culture. In addition, several of the incised and punctated decorative techniques continued to be used by the Plaquemine culture. However, Plaquemine craftsmen also brushed pottery, and engraved vessels after firing (Smith et al. 1983). Plaquemine Brushed represents the most widespread of the decorated ceramics. Other types used by the Plaquemine culture include L'eau Noire Incised, Coles Creek Incised *var. Hardy* (formerly Hardy Incised), Medora Incised, Mazique Incised *var. Manchac* (formerly Manchac Incised), and Evansville Punctated *var. Wilkinson* (Phillips 1970; Quimby 1951).

Mississippian Culture (A.D. 1000-A.D. 1700)

Late in the prehistoric period, the indigenous Plaquemine culture came under the influence of Mississippi culture from the middle Mississippi River Valley. Mississippian sites within Louisiana typically are identified along the south coastal region, and in isolated pockets of northeastern Louisiana.

The Mississippian subsistence pattern was based on cultivation of corn, beans, and squash; gathering of foodstuffs such as plants, nuts, and seeds; and hunting and fishing of local fauna. Settlement patterns reflected this diversity of subsistence activities. Larger sites, including large villages and ceremonial centers, were situated primarily along fertile bottomlands, and in areas favorable for extensive agriculture. Satellite communities such as smaller villages and hamlets, and coastal shell middens, surrounded the larger villages.

A distinguishing characteristic of Mississippian culture was elaborate treatment of the dead. Mississippian mortuary practices resembled those of Hopewell and Marksville; exotic ceremonial grave goods frequently accompanied burials. These included elaborate pottery vessels, and ceremonial objects made of stone, shell, copper, and mica. These Mississippian mortuary practices are commonly referred to as the Southeastern Ceremonial Complex, or "Southern Cult" (Smith et al. 1983).

Mississippian pottery is distinguished by its shell tempering, an innovation which possibly enabled craftsmen to manufacture larger vessels (Smith et al. 1983). Ceramic vessels included globular jars, plates, and bottles, along with loop- and strap-handled pots. Decorative techniques included negative painting, engraving, and incising. Vessels with animal or anthropomorphic decorations or forms also were constructed. Pottery types recovered from Mississippi culture sites include Mississippi Plain, Leland Incised,

Coleman Incised, Winterville Incised, Bell Plain, Pocahontas Punctated, Barton Incised, and Parkin Punctate (Phillips 1970). Other Mississippian artifacts include chipped and ground stone tools; shell items such as beads, gorgets, and hairpins; and copper and mica items.

Historic Contact

When the French first arrived in Louisiana, the Chitimacha inhabited much of south-central and southeast Louisiana. The Chitimacha lived from the Lower Atchafalaya Basin to Bayou Lafourche in the vicinity of the project area. In 1706, the French forced the Chitimacha out of the Bayou Lafourche region. The Chitimacha then relocated along Bayou Teche near Charenton, Louisiana. During the historic contact period, the Chitimacha population, like that of most native Americans, was seriously reduced by diseases such as measles, smallpox, influenza, and common colds. The surviving Chitimacha rapidly acculturated (Goodwin, Yakubik et al. 1985).

CHAPTER IV

PREVIOUS INVESTIGATIONS

Previous Cultural Resource Studies Near the Project Area

Several previous archeological investigations have been conducted in the vicinity of the project area. McIntire (n.d.) conducted a helicopter survey and selective pedestrian reconnaissance along a proposed pipeline corridor between the Gulf of Mexico, and Valentine, Louisiana. During his 1974 survey, two sites were identified in the project area vicinity: Bayou L'Ours Mounds (16LF54, McIntire's Site 27), and Bayou Raphael (16LF88, McIntire's Site 28). McIntire described Mound A at Bayou L'Ours Mounds as a 1 m high, 10 - 13 m diameter mound. Bayou Raphael was noted as a shell midden. No additional substantive information about either site was presented in his report.

McIntire (1979) surveyed a proposed Shell Oil Company pipeline corridor between Clovelly Oil and Gas Field and Norco, Louisiana. During survey, he identified one archeological site, the Clovelly site (16LF64). That site was characterized as a shell midden with Coles Creek and Mississippian components; it also contained the possible remains of a mound. The site was damaged extensively by modern channel construction, and by a modern camp which overlies it. Since the proposed pipeline construction would not impact the site, no further testing at Site 16LF64 was recommended.

Coastal Environments, Inc. (1981) tested the Delta Farms Site (16LF76) prior to construction of a bulkhead and loading facility adjacent to the east bank of the Gulf Intracoastal Waterway, near Larose, Louisiana. Testing included excavation of 17 closely spaced auger tests and three excavation units. In situ shell deposits were identified immediately adjacent to the waterway, but not extending back from it. Coastal Environments, Inc. concluded that the site consisted of the remains of a shell road, and that it was not a prehistoric cultural deposit.

Also in 1981, Floyd surveyed a proposed pipeline corridor between the Clovelly Facility north of the current project area and St. Bernard Parish, for Gulf Refining Company. No sites were located.

Most previous investigations conducted near the study area have consisted of archeological surveys of various segments of the Larose to Golden Meadow Hurricane Protection Project, of which the current study is the final part. These studies include Gibson 1978; Rader 1978; McIntire et al. 1981; Stout and Muller 1983; McCullough 1984; Ryan and Hicks 1984; and, Poplin et al. 1986. Gibson (1978) studied the Clovelly Farms levee and Louisiana Land and Exploration Company levee realignment, located a short distance north of the current project area. No archeological sites were found within his project area during Gibson's survey, although a spot find, X16LF1, was identified along

the east end of Clovelly Farms. Two possible Plaquemine sherds were located at this location. Gibson also visited the previously identified Bayou L'Ours Mounds (16LF54), collected a sample of ceramic sherds from the site, and placed a few shovel tests within the site to define better site boundaries. Since Site 16LF54 was located approximately 0.65 km east of the proposed levee corridor, no additional testing was conducted, and no recommendations were made concerning the site. No additional archeological testing was recommended along the survey corridor.

McIntire et al. (1981) surveyed Sections "F" First Lift and "A" East First Lift, of the Larose to Golden Meadow Hurricane Protection Levee Project. Although no cultural resources were identified within the survey corridor, three sites were found outside of the planned right-of-way. La Rose (16LF36) was a largely destroyed Coles Creek (Bayou Cutler Phase) and Plaquemine earth midden located adjacent to the Intracoastal Waterway. Delta Farms (16LF76) was interpreted as a remnant of a small Neo-Indian shell midden; it also was adjacent to the Intracoastal Waterway. As noted above, that site subsequently was tested by Coastal Environments, Inc. (1981), and interpreted as the remains of a shell road. The third site identified by McIntire et al. (1981) was 16LF97, a Plaquemine shell midden in the swamp east of Larose. Initial observations suggested that the site possessed archeological integrity. However, since all three sites were located outside of the project corridor, avoidance during construction was recommended; none of the sites were evaluated.

Stout and Muller (1983) studied the Larose Floodgate portion of the Larose to Golden Meadow Hurricane Protection Levee Project. No archeological sites were identified. However, they did record one important historic resource, the vessel *M/V Fox*. The *M/V Fox* subsequently was determined to possess the quality of significance as defined by the National Register of Historic Places criteria (Goodwin, Selby et al. 1984). HAER documentation of the *M/V Fox* subsequently was undertaken for the U.S. Army Corps of Engineers, New Orleans District (Goodwin, Selby et al. 1984).

Ryan and Hicks (1984) surveyed Reach E-South of the Larose to Golden Meadow project. They did not identify any sites within the survey corridor. However, Ryan and Hicks did conduct limited testing at Toups Place (16LF1), a nearby Plaquemine and Mississippian village or campsite located on the West Fork Bayou L'Ours natural levee. The site is covered by a meter of overbank deposition. One test unit, located at the edge of the project corridor and adjacent to the site, was excavated; no prehistoric artifacts were recovered from the unit. Based on archeological testing, Ryan and Hicks recommended no further testing within the project corridor. They also recommended that Toups Place be avoided during levee construction.

Three remaining archeological surveys were undertaken in association with the Larose to Golden Meadow project. Rader (1978) tested the Golden Meadow Floodgate Area. McCullough (1984) surveyed Section B North and Section B South Gap Closure,

while Poplin et al. (1986) surveyed the western sections of the proposed project. No cultural resources were located during any of these surveys.

Previously Located Sites Near the Project Area

Fourteen recorded archeological sites are located in the vicinity of the current project area (Table 1). With one possible exception, all of these sites are prehistoric, and most of them represent shell middens. Seven of these sites, 16LF57 through 16LF63, contain Troyville through Plaquemine components; the shell middens are buried under 1 to 2 ft (0.3 to 0.6 m) of alluvial deposits. The sites are clustered along West Fork Bayou L'Ours, southeast of Cut Off, Louisiana. Other shell middens include Toups Place (16LF1), a buried Coles Creek and Plaquemine shell midden, and 16LF97, a Plaquemine shell midden located on a buried natural levee. Bayou Raphael (16LF88) is a Neo-Indian village or campsite with intact shell midden deposits. La Rose (16LF36) is a Coles Creek (Bayou Cutler Phase) and Plaquemine earth midden adjacent to the Intracoastal Waterway.

Three additional sites were identified in the general vicinity of the study area. Bayou L'Ours Mounds (16LF54) is a two mound Troyville through Mississippian ceremonial center and village site adjacent to West Fork Bayou L'Ours; much of that site (16LF54) is within the current project area, and it was tested and evaluated during this study. Clovelly (16LF64) is a Coles Creek to Mississippian shell midden that contains the remains of a possible mound. This site has been damaged extensively by modern construction. Finally, the Delta Farms site (16LF76) adjacent to the Intracoastal Waterway was mentioned above. Coastal Environments, Inc. (1981) provided data indicating that it is the remnants of an historic shell road, and not a prehistoric site.

Only a small amount of the region has been surveyed for cultural resources, and relatively few sites have been recorded in the area. As more archeological surveys and site excavations are conducted, it is anticipated that a wider variety of historic and prehistoric archeological sites will be located, resulting in a more complete understanding of the area's cultural development.

Recorded Mound Sites in Assumption, Lafourche, and Terrebonne Parishes

A total of 52 mound sites have been recorded in Assumption, Lafourche, and Terrebonne parishes (Table 2), the three parishes which encompass the Lafourche delta lobe. These include Bayou L'Ours Mounds (16LF54), which was tested during the current investigations. In comparing the other sites with Bayou L'Ours Mounds, several observations can be made. Thirty-two of the sites, including 16LF54, contain earthen mounds. While the majority of these sites contain a single recorded mound, five include two mounds (16AS36, 16LF33, 16LF54, 16TR37, and 16TR86); another five are three-

Table 1

PREVIOUSLY RECORDED ARCHEOLOGICAL SITES NEAR THE PROJECT AREA[1]

Site No.	Site Name	Site Description	Location	NRHP Eligibility	Recorded By
16LF1	Toups Place	Buried Cole Creek and Plaquemine shell midden	East bank of West Fork Bayou L'Ours, southeast of Cut Off, LA	Potentially eligible	Kniffen 1941; Ryan 1984; Hicks 1984
16LF36	LaRose	Coles Creek (Bayou Cutler Phase) and Plaquemine buried earth midden	Adjacent to the Intracoastal Waterway, at LaRose, LA	Unknown	McIntire and Saucier 1955
16LF54	Bayou L'Ours Mounds	Troyville through Mississippian two mound ceremonial center and village site, with a possible Marksville component; the site is within the current project area	West bank of West Fork Bayou L'Ours, east of Galliano, LA	Eligible	McIntire 1974
16LF57	None	Troyville through Plaquemine buried shell midden	Adjacent to West Fork Bayou L'Ours, southeast of Cut off, LA	Unknown	Gibson 1978
16LF58	None	Troyville through Plaquemine buried shell midden	East bank of West Fork Bayou L'Ours, southeast of Cut Off, LA	Unknown	Gibson 1978
16LF59	None	Troyville through Plaquemine buried shell midden	Adjacent to West Fork Bayou L'Ours, southeast of Cut Off, LA	Unknown	Gibson 1978

Site No.	Site Name	Site Description	Location	NRHP Eligibility	Recorded By
16LF60	None	Troyville through Plaquemine buried shell midden	Adjacent to West Fork Bayou L'OUrs, southeast of Cut Off, LA	Unknown	Gibson 1978
16LF61	None	Troyville through Plaquemine buried shell midden	Adjacent to West Fork Bayou L'Ours, southeast of Cut Off, LA	Unknown	Gibson 1978
16LF62	None	Troyville through Plaquemine buried shell midden	Adjacent to West Fork Bayou L'Ours, southeast of Cut Off, LA	Unknown	Gibson 1978
16LF63	None	Troyville through Plaquemine buried shell midden	East bank of West Fork Bayou L'Ours, southeast of Cut Off, LA	Unknown	Gibson 1978
16LF64	Clovelly	Coles Creek to Mississippian probable mound site with associated shell midden, largely destroyed	At confluence of Bayou Poignard and Bayou des Amoreux, northeast of Cut Off, LA	Unknown	McIntire 1979
16LF76	Delta Farms	*Rangia* shell lens possibly associated with a remnant prehistoric shell midden or an historic road	Adjacent to the Intracoastal Waterway, near LaRose, LA	Not eligible	Weinstein and Burden 1975
16LF88	Bayou Raphael	Neo-Indian village or campsite with a shell midden	East bank of Bayou Raphael, east of Galliano, LA	Unknown	McIntire 1974

Site No.	Site Name	Site Description	Location	NRHP Eligibility	Recorded By
16LF97	None	Plaquemine shell midden on buried natural levee, in marsh	In marsh east of LaRose, LA	Unknown	McIntire 1981

[1]Data obtained from the State Site Files, Louisiana Division of Archaeology, Department of Culture, Recreation and Tourism, Baton Rouge.

Table 2. Previously Recorded Mound Sites in Assumption, Lafourche, and Terrebonne Parishes.[1]

NUMBER	NAME	SITE DESCRIPTION	CULTURAL AFFILIATION	GEOMORPHIC LOCATION	TESTING	NRHP ELIGIBILITY
Assumption Parish						
16AS1	Big Goddel Bayou Mounds	Shell mound and midden	Marksville, Coles Creek, Plaquemine, Mississippian	Natural levee of Big Goddel Bayou	Surface collection	Unknown
16AS5	Pierre Part	Possible earthen mound; mound reported in vicinity by C.B. Moore; no cultural materials located in 1977 examination of small rise	Prehistoric unknown	Natural levee of Bayou Grosbec	Surface collection, shovel tests, auger tests	Unknown
16AS6	Lake Verret	Two shell mounds	Prehistoric unknown	On bank adjacent to Lake Verret	Surface collection	Unknown
16AS7	Pierre Bayou	One shell mound	Prehistoric unknown	Natural levee of Bayou Pierre	Surface collection	Unknown
16AS8	Shell Point	One shell mound	Coles Creek, Plaquemine	On bank adjacent to Lake Verret	Surface collection	Unknown
16AS16	Pennison Site	Earthen mound	Coles Creek	Natural levee of Bayou L'Ourse, at crevasse splay	Surface collection	Unknown
16AS21	None	Earth and shell mound, and shell midden	Coles Creek, possibly Plaquemine	On bank adjacent to Lake Verret	Surface collection	Unknown
16AS25	None	Earthen mound and adjacent shell midden	Troyville-Coles Creek	Natural levee of Belle River	Surface collection	Unknown
16AS27	None	Earthen and shell mound, and shell midden	Coles Creek	Natural levee of Bayou Louis	Surface collection	Unknown

Table 2, continued

NUMBER	NAME	SITE DESCRIPTION	CULTURAL AFFILIATION	GEOMORPHIC LOCATION	TESTING	NRHP ELIGIBILITY
16AS36	Bayou Caroline Mounds	Two prehistoric earthen mounds	Prehistoric unknown	Natural levee of Bayou Boeuf, at crevasse splay	Surface collection	Not eligible; site destroyed
Lafourche Parish						
16LF4	Temple Mound	Shell and earthen mound overlying a shell midden, with trash pits, postmolds, and one known burial; village site	Troyville, Coles Creek, Mississippian, Historic Contact into nineteenth century	Adjacent to Lake Salvador, between the mouths of two bayous	Surface collection, shovel testing	Declared eligible; subsequently damaged extensively or destroyed
16LF15-16LF28	Bayou Grand Coteau	Small earthen mound	Prehistoric unknown	Natural levee of Bayou Grand Coteau	Surface collection	Unknown
16LF17	Bayou Chactimahan	Three conical earthen mounds, with burials	Coles Creek, Plaquemine	Natural levee of Bayou Chactimahan	Surface collection, excavation (no report available)	Unknown; site damaged or destroyed
16LF32	Bayou Blue	Earthen mound	Prehistoric unknown	Natural levee of Bayou Blue	Surface collection	Unknown
16LF33	Bergeron School	Two small earthen mounds; village site	Plaquemine, late Mississippian	Natural levee of Bayou Blue	Surface collection, two test units	Potentially eligible
16LF35	Larose	Shell mound and midden; village site	Coles Creek, possible Marksville component	Natural levee of relict unnamed bayou	Surface collection, possible limited testing	Potentially eligible

Table 2, continued

NUMBER	NAME	SITE DESCRIPTION	CULTURAL AFFILIATION	GEOMORPHIC LOCATION	TESTING	NRHP ELIGIBILITY
16LF48	None	Pyramidal earthen mound	Troyville, Coles Creek	Natural levee of Bayou L'Ours, near crevasse splay	Surface collection	Potentially eligible
16LF54	Bayou L'Ours Mounds	Two earthen mounds surrounded by shell middens and village site, with one known burial	Troyville through Mississippian, with a possible Late Marksville component	Natural levee of West Fork Bayou L'Ours, at crevasse splay	Tested during current investigations, surface collection, shovel testing, auger testing, excavation units	Declared eligible
16LF55	Alombro Cemetery	Earthen mound group, with six or seven possible mounds; possible village site	Prehistoric unknown	Natural levee of East Fork Bayou L'Ours	Surface collection	Potentially eligible
16LF64	Clovelly	Earthen mound and shell midden	Coles Creek to Mississippian	Natural levee at confluence of Bayous Poignard, des Amoreux, and Pierce	Surface collection, auger testing	Unknown
16LF96	Alone	Shell mound and midden	Coles Creek or Plaquemine	Natural levee of Bayou Vacherie	Surface collection	Unknown
16LF100	East Fork Bayou L'Ours	Shell mound or midden	Neo-Indian	Natural levee of East Fork Bayou L'Ours	Surface collection	Unknown

Table 2, continued

NUMBER	NAME	SITE DESCRIPTION	CULTURAL AFFILIATION	GEOMORPHIC LOCATION	TESTING	NRHP ELIGIBILITY
16LF101	Shell Pond	Shell mound or midden	Coles Creek	Possible submerged natural levee near East Fork Bayou L'Ours	Surface collection	Unknown
15LF102	Kings Ridge	Possible shell mound or midden	Prehistoric unknown	Natural levee of East Fork Bayou L'Ours	Not visited, site data based on historic map	Unknown
16LF232	Golden Ranch 164	Shell mound and midden; village site	Neo-Indian	Natural levee of small unnamed bayou	Surface collection, limited shovel testing	Potentially eligible
16LF239	Golden Ranch 173	Shell mound and midden	Neo-Indian	Natural levee of small unnamed bayou	Surface collection	Potentially eligible
16LF240	Golden Ranch 240	Shell mound and midden	Neo-Indian	Marsh; possible submerged natural levee or lake shore site	Surface collection	Potentially eligible
16LF243	Golden Ranch 178	Shell mound and midden	Prehistoric unknown	Submerged natural levee of Bayou Matherne	Surface collection	Potentially eligible
Terrebonne Parish						
16TR1	Mandalay Plantation	Earthen mound; village site; possible burials; no evidence of a mound observed in 1978 examination of the site	Mandalay Phase of Marksville	Distal portion of Bayou Black natural levee	Surface collection, shovel tests	Unknown; site possibly destroyed

Table 2, continued

NUMBER	NAME	SITE DESCRIPTION	CULTURAL AFFILIATION	GEOMORPHIC LOCATION	TESTING	NRHP ELIGIBILITY
16TR5	Gibson Mounds	Three earthen mounds, with surrounding shell midden; village site	Marksville, Baytown, Coles Creek, Plaquemine	Natural levee of Bayou Black, near its confluence with Tiger Bayou	Surface collection, test excavations	Unknown
16TR6	Dulac	Earthen mound and shell midden	Late Coles Creek to early Plaquemine, antebellum to present	Natural levee of Bayou Grand Caillou	Surface collection, shovel tests	Unknown; site possibly destroyed by bankline erosion
16TR7	Indian Mound	Five earthen mounds, two of which are destroyed; the other three mounds are surmounted by a cemetery, an historic brick factory remains, and a house	Possibly Plaquemine, Historic Contact, nineteenth and twentieth century	Natural levee of Bayou Petit Caillou	Surface collection, test excavations	Unknown; portion of site destroyed
16TR19	Marmande Plantation Site	Large pyramidal earthen mound, with burials, and surrounding shell midden; village site	Troyville of Coles Creek, Plauqemine	Natural levee of Bayou Du Large	Surface collection, shovel tests and one test unit in nearby artifact scatter	Unknown
16TR22	Mound Bayou	One earthen mound, possibly with burials; two other possible mounds; shell midden; village site	Coles Creek, Mississippian	Natural levee of Bayou Grand Caillou, near its confluence with Mound Bayou	Surface collection	Unknown; site partially destroyed
16TR32	Pointe au Chien #1	Six earthen mounds and surrounding shell midden; historic homestead and cemetery	Neo-Indian, nineteenth and twentieth century	Natural levee of Bayou Pointe au Chien	Surface collection	Unknown

Table 2, continued

NUMBER	NAME	SITE DESCRIPTION	CULTURAL AFFILIATION	GEOMORPHIC LOCATION	TESTING	NRHP ELIGIBILITY
16TR33	Pointe au Chien #2	One earthen mound and surrounding shell midden, surmounted by historic structure remains	Neo-Indian, historic unknown	Natural levee of Bayou Pointe au Chien	Surface collection, shovel testing, test units	Unknown
16TR34	Pointe au Chien #3	Three pyramidal earthen temple mounds	Prehistoric unknown	Natural levee of Bayou Pointe au Chien	Surface collection	Unknown
16TR35	Bayou Sale #2	Earthen and shell burial mound	Coles Creek and Plaquemine	Natural levee at confluence of Bayou Sale and unnamed bayou	Surface collection	Unknown
16TR37	Ellesly Plantation	Two large pyramidal earthen temple mounds; village site; historic cemetery on smaller of the two mounds	Troyville through Mississippian, historic unknown	Natural levee of Bayou Grand Caillou	Surface collection, shovel testing	Unknown
16TR38	Indian Mound-Grand Caillou	Three earthen temple mounds, one of which is destroyed; historic domestic debris; modern graves	Coles Creek, Plaquemine, possible Historic Contact, historic unknown	Natural levee of Bayou Grand Caillou	Surface collection, shovel tests, test units	Unknown; portion of site destroyed
16TR39	Bayou Sale #3	One small earthen mound	Prehistoric unknown	Subsided natural levee of unnamed bayou	Surface collection	Unknown
16TR45	Turtle Bayou	One small shell mound	Prehistoric unknown	Natural levee of Turtle Bayou	Surface collection	Unknown

Table 2, continued

NUMBER	NAME	SITE DESCRIPTION	CULTURAL AFFILIATION	GEOMORPHIC LOCATION	TESTING	NRHP ELIGIBILITY
16TR50	Turtle Bayou	Large shell mound or midden, with a human burial	Marksville, Baytown, Coles Creek	Natural levee of Turtle Bayou	Surface collection	Unknown
16TR61	Lake Houma-Bayou	Submerged or destroyed small earthen mound	Whitehall Phase of Troyville, Bayou Cutler Phase of Coles Creek, Plaquemine, Delta Nachezan Phase of Mississippian	Currently marsh or shallow lake; formerly possible distal edge of Bayou Little Coteau crevasse splay	Surface collection, elevation transects, bottom soundings in inundated area	Unknown; possibly destroyed
16TR62	Houma	Small earthen mound, probably destroyed by construction of a tank farm	Bayou Petre Phase of Mississippian	Currently marsh; possibly on distal natural levee of Bayou Little Coteau or Bayou Terrebonne	Surface collection, shovel testing	Not eligible; site recorded as destroyed
16TR63	Bayou Blue	Small circular earthen mound	Plaquemine	Distal natural levee of Bayou Terrebonne or Bayou Blue	Systematic surface collection, shovel testing	Unknown
16TR78	Bayou Black	Small shell mound; possible destroyed earthen mound with burials	Coles Creek	Natural levee of Bayou Black	Surface collection, shovel testing	Unknown
16TR82	Richeu Field	Earthen mound, possibly with burials; village site	Baytown, Coles Creek	Natural levee of Bayou Black	Surface collection	Unknown
16TR86	Bayou Terrebonne-Rhodes Cemetery	Two low earthen mounds; village site; historic cemetery on one of the mounds	Late Coles Creek, Plaquemine	Natural levee of Bayou Terrebonne	Surface collection, shovel testing	Unknown

Table 2, continued

NUMBER	NAME	SITE DESCRIPTION	CULTURAL AFFILIATION	GEOMORPHIC LOCATION	TESTING	NRHP ELIGIBILITY
16TR100	Saw Dust Mound	Earthen mound surrounded by deteriorating farmstead buildings; possible sawmill remains; investigators uncertain whether or not the mound is prehistoric	Possible prehistoric unknown, late nineteenth to early twentieth century	Natural levee of Bayou Black	Reconnaissance, small test hole in mound	Unknown
16TR188	None	Possible circular earthen mound	Prehistoric unknown	Natural levee of Chacahoula Bayou, near its confluence with Bayou Black	Surface collection	Unknown
16TR189	Bayou Sale Mounds	Three earthen mounds in an excellent state of preservation; shell midden; village site; historic scatter	Late Coles Creek to early Plaquemine	Subsided natural levee of Bayou Sale, at crevasse splay	Surface collection	Potentially significant

[1]Data obtained from the State Site Files, Louisiana Division of Archaeology, Department of Culture, Recreation and Tourism, Baton Rouge.

mound sites (16LF17, 16TR5, 16TR34, 16TR38, and 16TR189); one site, 16TR7, originally contained five mounds, two of which are destroyed; and, two sites (16LF55 and 16TR32) are comprised of six to seven mounds. Four of the recorded mound sites contain earthen and shell mounds; it remains unclear whether these mounds are purposely constructed ceremonial or burial mounds, or mounds formed by the accumulation of habitational (especially shell) debris. The final 16 sites contain shell mounds, including 15 with one mound, and one (16AS6) with two mounds. These shell mounds formed through the accumulation of shellfish debris; their primary function was resource procurement, as opposed to ceremonial or burial functions.

While the cultural affiliation of many of the sites has not been determined, those which are known range in age from Marksville through Mississippian and Historic Contact. Most date to the Troyville culture and later. Several include historic components, such as domestic sites and cemeteries. These prehistoric dates correspond fairly well with the probable formation of the delta lobe, estimated at 2000 years ago.

All of the earthen mounds are located on natural levees. While a few are situated on the distal edges of these levees, the majority are located near the crests of the levees, and adjacent to a bayou. Some of the sites currently have subsided into the marsh, including 16LF101, 16LF240, 16LF243, 16TR39, 16TR61, 16TR62, and 16TR189. At least six of these earthen mound sites, including Bayou L'Ours Mounds, were built at crevasse splays (16AS16, 16AS36, 16LF48, 16LF54, 16TR61, and 16TR189), while another five were constructed near the confluence of two or more bayous (16LF64, 16TR5, 16TR22, 16TR35, and 16TR188). While some of the shell mounds (16AS1, 16AS7, 16LF35, 16LF96, 16LF100, 16LF102, 16LF232, 16LF239, 16LF243, 16TR45, 16TR50, 16TR78, and possibly 16LF101), and the earthen and shell mounds (16AS27 and 16TR35), were located on natural levees, others were located along Lake Varret (16AS6, 16AS8, and 16AS21) and Lake Salvador (16LF4). It is unclear whether 16LF240, a shell mound, was formed on a lake shore, or on a now subsided natural levee.

In general, very little archeological work has been done at these sites. While most of the 52 mound sites have been surface collected, the state site files indicate that subsurface testing has been conducted at only 21 of the sites (Table 2). The majority of subsurface testing has been confined to shovel and auger testing; test units have been placed in eight, and possibly nine, of the mound sites. The dearth of substantive archeological testing conducted at these sites is reflected in the low number which have been evaluated. Two of the 52 sites (16AS36 and 16TR62), both of which have been destroyed, are recorded as not eligible for inclusion in the National Register of Historic Places. Only two of the sites have been declared eligible for the National Register: Temple Mound (16LF4), and Bayou L'Ours Mounds (16LF54). Temple Mound subsequently was damaged extensively or destroyed; it is unclear whether or not the site, in its current condition, is eligible for the National Register. Bayou L'Ours Mounds were declared eligible based on the current investigations. The remaining 48 mound sites have not been evaluated.

CHAPTER V

HISTORIC LAND USE

Introduction

The project area stretches along West Fork Bayou L'Ours and extends through Section 31, and Sections 7, 6, 10, 11, and 33, Townships 18S and 19S, Range 22E, in Lafourche Parish, Louisiana (Figure 1). The Allain-LeBreton Company currently owns the property, which is represented in patents 6809, 188 through 192, and 197. This chapter reviews the land tenure history and the land use history of the project area.

Land Tenure

In June 1859, 68-year-old Camille Zeringue received a patent to Section 31 (Figure 6). Eight years later, in March 1867, 34-year-old Jean Fortune Zeringue acquired patents to the remainder of the property and transferred title to his father, Camille, who became sole owner of the project area (COB 10, Folio 320; COB 65, Folios 131, 132, 134, 135, 136, 138 Lafourche Parish Courthouse).

The Zeringue family settled in Louisiana during the eighteenth century. For example, in 1798, Jean Louis Zeringue was listed in a census of the old Spanish district of "La Fourche de los Chetimachac" (Robichaux 1974:113). Prior to acquiring property within the current project area, Camille Zeringue owned and operated a sugar plantation on the right bank of the Mississippi River in Jefferson Parish, Louisiana. In 1850, Camille's estate was valued at $80,000.00 (Boling 1986:113; Champomier 1850:25).

In 1879, Camille Zeringue still owned the West Bank plantation in Jefferson Parish. However, J. F. Zeringue became the proprietor the following year. The younger Zeringue attempted to grow rice on the West Bank sugar plantation, but after 1890-1891 his agricultural enterprise disappeared from the records (Bouchereau 1879, 1880, 1891, 1892). There is no evidence that either Camille or J. F. Zeringue found any use for the land they acquired in the project area near Golden Meadow.

The exact date of Camille Zeringue's death is not known, but his property passed to his widow, Magdelene Lise Roman, and the five children who survived him: Lise, Camille (a daughter), Celeste, Marie Adeline, and Fortune. Probate court in Jefferson Parish confirmed the succession in 1913 by a judgement of possession (COB 45, Folio 136 Lafourche Parish Courthouse). The court decree also established that the property inherited by Marie Adeline and Fortune, both subsequently deceased, should pass to the surviving children, all three of whom became nuns (COB 45, Folio 136; COB 49, Folio 426, Lafourche Parish Courthouse).

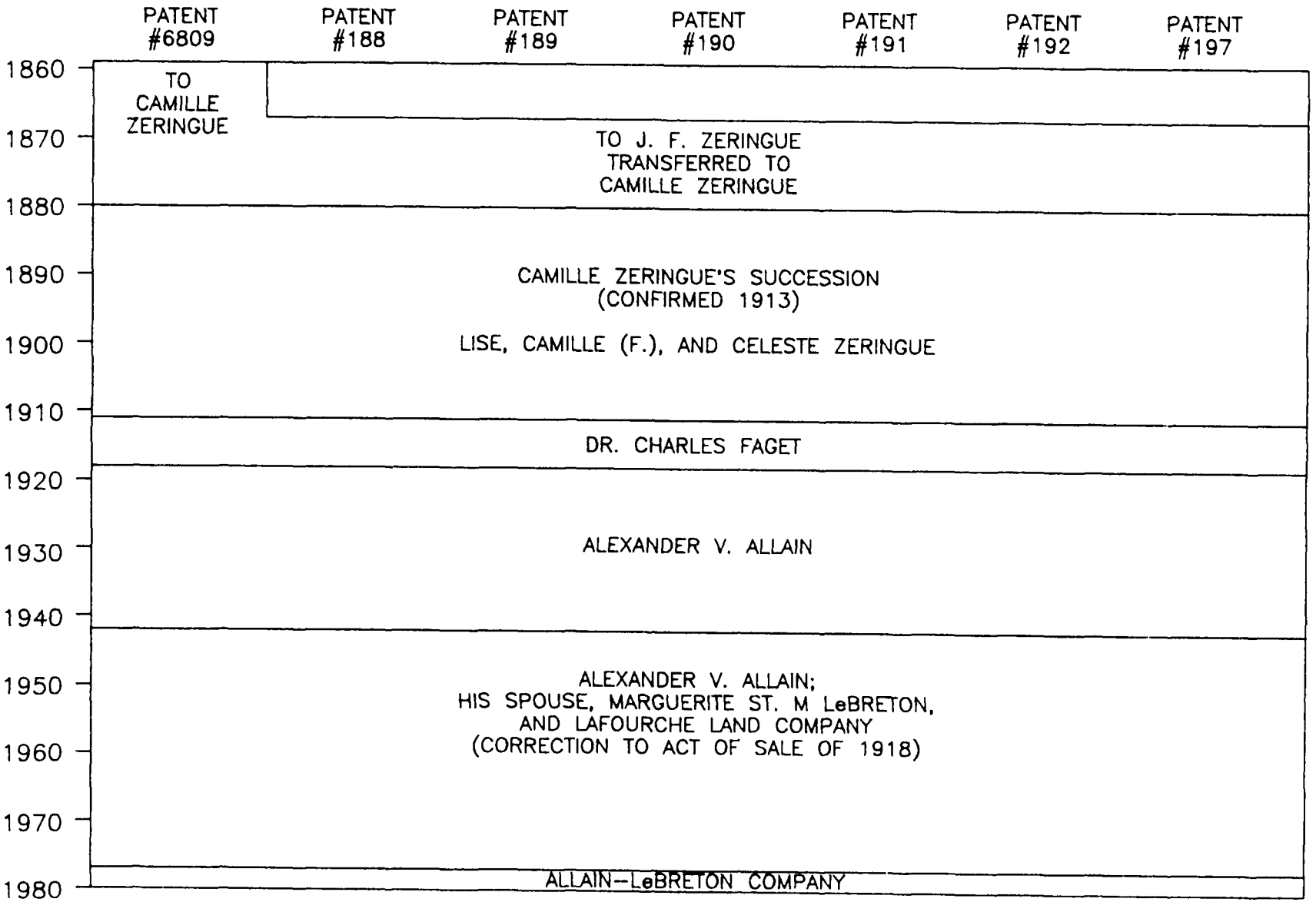


Figure 6. Changes of title in the project area.

In 1911, the three sisters donated 1,492 acres from the Zeringue succession to Dr. Charles Faget. The donation settled original claims against the estates of Camille and Jean Fortune Zeringue by heirs and legatees of Joseph Lombard. Along with the Zeringue sisters' donation, E. St. M. LeBreton also donated 1,700 acres to the heirs of Joseph Lombard (COB 44, Folio 139, Lafourche Parish Courthouse).

The property changed hands again in 1918, when John C. Faget and seven other members of the Faget family sold their land to Alexander V. Allain, spouse of Marguerite St. M. LeBreton. A correction to this act of sale was made many years later (1942), when various members of the Faget family agreed to an amended description of the property and issued a quitclaim to that effect (COB 102, Folio 496, Lafourche Parish Courthouse).

By 1942, ownership of the land was vested not only in the names of Alexander V. Allain and his spouse, Marguerite St. M. LeBreton, but also in the Lafourche Land Company, Incorporated. In 1977, this land company transferred title, including leases, funds, and property, to the Allain-LeBreton Company (COB 614,Folio 190, Lafourche Parish Courthouse). Indices to the Lafourche Parish conveyance records indicate that the petroleum industry utilized the property through leases, royalty sales, and rights of way. The Clovelly Oil and Gas Field, Section 32, adjoins the property.

Historic Land Use

Six of the original patents describe the project area either as "swamp" or as "swampland subject to tidal overflow" (COB 65, Folios 131, 132, 134, 135, 136, 138 Lafourche Parish Courthouse). The project area currently is characterized as Agricultural Class Four (freshwater marsh, sea marsh, and split drainage), and it contains no improvements (Lafourche Parish Tax Roll 1989).

The area is located in Lafourche Parish below what residents call an "intangible dividing line" between the upper and lower reaches of Bayou Lafourche (Ditto 1980:56). This "intangible dividing line" is situated near Larose and signifies differences in land use, both in the upper and lower regions of the parish and in the lives of the people who settled up and down the bayou.

Below the dividing line, natural levees markedly decrease in size, and swamps occur much closer to the levees. Periodic flooding occurs, and the intruding salt water inhibits crop production. The land is only marginally suitable for agriculture. Farming has remained primarily small scale. In the upper Lafourche region, the plantation system developed during the nineteenth century, and sugar cane became the major staple crop.

However, there are some exceptions to this generalization. In 1846, Octave Harang developed a prosperous sugar plantation in the area near present-day Larose. He also dug a canal, really little more than a ditch, that connected Bayou Lafourche with

Lake Salvador. Small farmers utilized this canal to transport their produce, particularly oranges and rice, to market in New Orleans (Ditto 1980:57). However, periodic flooding brought greater amounts of salt water into the area, ruining citrus and rice crops (Ditto 1980:25; Uzee 1985:101-104). Consequently, hunting and trapping of alligator, otter, mink, and raccoon remained an important means of subsistence for many who lived in the area.

Since the potential for agricultural production in the lower Lafourche area was small, settlement proceeded at a much slower pace and trailed a century behind settlement in the upper parish. It wasn't until well into the nineteenth century that settlers in any number began to arrive in the area. The lands around Larose were settled in the middle of the nineteenth century, and numerous members of the Cheramie family established themselves around Golden Meadow in the 1870s (Uzee 1985:122-123). Settlement down the bayou advanced at a rate of about 15 km every 20 years. In the late nineteenth and early twentieth centuries, however, hurricanes interrupted settlement in the region. These storms made such a mark on the history of the bayou that they deserve extensive consideration.

Hurricanes

Hurricanes influenced every aspect of life and work in the lower Lafourche area. Hurricanes swept away trees and damaged structures, and they also caused salt water flooding of farm land. They levelled ridges, and changed the configuration of the surrounding area, influencing settlement of the lower parish. In the late eighteenth century, a hurricane drove settlers to (rather than away from) the Lafourche area. In August 1794, a group of Acadians living on Bayou des Ecores (present-day Thompson's Creek) in West Feliciana lost their livestock, crops, fences, and other improvements to a hurricane. A report to the Spanish governor, Baron de Carondelet, described the ruin of the settlement and the decision of the 277 Acadians to relocate to the Lafourche region. The Lafourche district appealed to the Acadians since it was farther away from both the provincial government and the Creoles (Brasseaux 1987:112; Uzee 1985:35).

The hurricanes of 1893, 1909, and 1915 battered the area, prompting large evacuations of the Lafourche region. One local chronicler described the late nineteenth and early twentieth centuries as a time of "...retreat from the Gulf of Mexico; a desertion of old sites which were no longer safe or productive" (Uzee 1985:97).

On the first day of October 1893, a hurricane struck the Gulf Coast near Grand Isle and eradicated the village of Caminadaville. The storm transformed the town and its fields into swamp, washed away ridges and barrier beaches, and flooded the lower Lafourche region. Two thousand people lost their lives. The surviving inhabitants of Caminadaville buried the dead, salvaged what they could, and resettled elsewhere. Many of them moved up Bayou Lafourche and established a settlement at the first high ridge, an area which later became Leeville, Louisiana.

Leeville nearly was destroyed 16 years later when another hurricane struck the area and advanced up Bayou Lafourche. The hurricane flooded the community with 3 ft of water. Fortunately, only one death resulted. Most of the citizens escaped to safety farther up the bayou; some decided not to return.

Those who returned to Leeville rebuilt their town only to find themselves in the path of an even more devastating storm six years later. In September 1915, an immense hurricane inundated Leeville with 14 to 20 ft of water. The storm demolished nearly every building in the town and washed away the topsoil. Furthermore, salt and brackish water flooded the oak forest and killed the trees that once shaded Bayou Lafourche.

In many cases, the 1893, 1909, and 1915 storms repeatedly demolished homes of the same families. After the hurricane of 1915, many residents again retreated up Bayou Lafourche and established themselves around the little settlement at Golden Meadow; there the water rose only 4 ft. According to local tradition, some of the more thrifty refugees used lumber salvaged from their previously destroyed dwellings to build their homes in Golden Meadow (Uzee 1985:98-99).

In describing the effect of these hurricanes and floods along the lower Lafourche, one Parish historian takes a pessimistic view, "the sea is relentlessly reclaiming its territory and no tree or ridge can withstand the onslaught. The great Mississippi has been harnessed, and it can no longer replenish these lands which it created" (Uzee 1985:97). However, another local historian presents a more optimistic outlook when describing the impact of Hurricane Betsy, which battered the area in 1965:

> Then on Sept. 9, 1965, came "Betsy", and a town that had its beginning as a result of the forces of nature, was once again reduced to rubble as a result of this hurricane [sic]. But the people of Golden Meadow, possessing the same frontier qualities that prompted their forefathers to settle here, are determined once again to pick up the pieces and rebuild this town so that Golden Meadow will continue to live up to its reputation as the fastest growing and wealthiest town in the parish [Rome 1966:49-50].

There was indeed a considerable influx of settlers into the little community as "a result of the forces of nature." According to one local story, Levi Collins's little house floated from Leeville up to Golden Meadow on the surge of the 1915 hurricane. Before the waters receded, Collins arranged the position of the cottage so it faced the bayou and then bought the land where his house had landed (Uzee 1985:103).

Occupational Trends

Fishermen found that they could not only provide relatively safe housing for their families in Golden Meadow, but they could also be within reach of their former fishing grounds (Uzee 1985:106). Thus, Golden Meadow became the headquarters of a prosperous shrimp and oyster industry. As one enthusiastic booster in 1945 described it, "Upper Lafourche belongs to the farmer -- but in Lower Lafourche the fisherman is boss of the bayou" (Borne 1945:13).

Because of its location near the gulf and the physical difficulties of surveillance, smuggling also emerged as a profitable occupation in the lower Lafourche area. When the United States abolished African slave trade, smuggling slaves into the country became so prevalent around Barataria Bay and Bayou Lafourche that in 1812 the federal government sent in troops to suppress the illegal trade (Gayarre 1974:228-229; Taylor 1960:36-43). A similar situation developed during prohibition when rum running became a new sideline for fishermen in the area. Exact figures obviously are not available, but according to local accounts, the operation was extensive and the profits were considerable, including profits for revenue agents. One local resident recalled that "many a federal man was worth about $10,000.00 in them days" (Kane 1943:218).

After 1915, muskrat became a fashionable fur in the United States, and this proved to be a boon for the people of the lower bayou. The price for a pelt rose from eight cents in 1914 to fifty cents in 1922. From 1922 to 1928, fur trapping was very lucrative; one member of the Cheramie family, a barber by trade, made enough money from trapping to pay for his house in Golden Meadow (Uzee 1985:103, 157). Trapping muskrat and nutria continued to be very profitable until about 1935.

Abandoned after the hurricane of 1915, Leeville was resettled in 1931 after the discovery of oil (Uzee 1985:103). In 1938, oil also was discovered in Golden Meadow. This strike transformed the town from a fishing village and gave new meaning to the name, Golden Meadow, which supposedly originated from the fields of goldenrod found throughout the area. Regardless of the origin of the appellation, "...history will prove that, through the years, golden harvest has come out of the ground of the one-time goldenrod fields as well as from the sea" (Rome 1966:45).

Summary

There is no historical evidence of any profitable harvest, golden or otherwise, having been gathered from the project area. The original patents describe the area as swamp or swampland subject to tidal overflow, and the history of the lower Lafourche area indicates that even small scale agricultural production would be difficult if not impossible. At present, there are no improvements on the property. One local observer in Lafourche Parish believes that the land was used only for hunting and trapping,

"officially or, more than likely, unofficially" (John Pugh, Jr., personal communication 1990). Although oil and gas fields are adjacent, none is located within the project area.

Like so much of the lower Lafourche area, the project area throughout history was subjected to the ferocious damage of hurricanes and tropical storms. The apparent lack of historic settlement in conjunction with the destructive forces of hurricanes drastically reduces the probability of encountering intact historic deposits within the project corridor.

CHAPTER VI

FIELD METHODOLOGY

Cultural resources survey of Levee Section D, Larose to Golden Meadow Hurricane Protection Project, was conducted along West Fork Bayou L'Ours in Lafourche Parish, Louisiana. Survey began south of Breton Canal and east of West Fork Bayou L'Ours. From there, it proceeded in a southeasterly direction, extending approximately 6.7 km to the southeast edge of the borrow pit area west of West Fork Bayou L'Ours (Figure 1). The survey was designed to identify and to assess the significance of all cultural resources within the project corridor. Fieldwork consisted of intensive pedestrian survey supplemented by systematic subsurface testing.

Prior to fieldwork, the project area was divided into six segments (numbered 1 through 6). Segments 1, 4, 5, and 6 subsequently, were subdivided (1A, 1B, 4A, 4B, 4C, 5A, 5B, 6A, and 6B) where roads and canals intersected the original segments. Each segment was surveyed in linear transects spaced 20 m apart and oriented parallel to the axis of the proposed levee corridor. Within the large planned borrow pit area south of West Fork Bayou L'Ours, transects were placed east-west, parallel to the sides of the project alignment. The survey covered approximately 210 acres.

A visual inspection of the ground surface in each segment was augmented by systematic shovel tests placed along the linear survey transects. Shovel tests were excavated at 50 m intervals along each survey transect; along adjacent transects, shovel tests were offset. Each shovel test measured approximately 30 cm in diameter, and each extended into culturally sterile subsoil. Excavated soils were screened through .6 cm (0.25 in) wire mesh; wet plastic soils, such as clays, were hand sifted to ensure artifact recovery. Recovered artifacts were labeled by segment, transect, and shovel test number. Stratigraphic profiles of all shovel tests were drawn, and each shovel test was backfilled immediately upon completion of the archeological recordation process. A total of 520 shovel tests were excavated during survey. Shovel tests were not excavated in standing water.

One previously recorded archeological site, Bayou L'Ours Mounds (16LF54), was identified within the project corridor. Additional testing was conducted to provide sufficient data for evaluating this site against the National Register of Historic Places criteria [36 CFR 60.4 (a-d)]. Testing focused on the part of the site located within the project corridor. The site was mapped and photographed. Thirty-seven shovel tests were excavated along seven rays to delineate site boundaries within the survey corridor. Eight 2-inch Dutch auger tests also were placed within and near the site. These were excavated to depths of 60 to 90 cm below surface, and well into culturally sterile natural levee deposits. Orthophosphate soil samples were collected at 10 cm increments within each auger test. One test, Auger Test 2, was placed outside the site and served as a

control for orthophosphate samples. The excavated soils were screened and examined for cultural materials. In addition, the stratigraphy and soil characteristics of each auger test were recorded using a textural triangle and Munsell Soil Color Charts; each test also was recorded and plotted on the site map.

Eight excavation units were placed within the project right-of-way. These included five 1 x 1 m units, one 0.5 x 1 m unit, one 50 x 50 cm unit, and the removal of one 10 cm x 1 m balk. All units were oriented along a north-south axis. These units were excavated by natural stratigraphy; each unit was photographed, profiled, and, described in the field notes. All excavated units were backfilled prior to completion of fieldwork.

CHAPTER VII

RESULTS OF THE FIELD INVESTIGATIONS

Introduction

In accordance with the Scope of Services, the entire project area was surveyed for cultural resources using intensive pedestrian survey and systematic shovel testing. One archeological site and one locus containing modern refuse were identified within the project area during survey. The site, Bayou L'Ours Mounds (16LF54), a prehistoric mound and habitation site, was located on the west bank of West Fork Bayou L'Ours. The locus containing modern refuse was found at the southeast end of Segment 3.

Bayou L'Ours Mounds (16LF54)

The Bayou L'Ours Mounds (16LF54) are situated on the west bank of West Fork Bayou L'Ours and on either side of a dirt road (Figures 1 and 7). The site is situated on the bayou's natural levee, at the juncture of the Bayou and an old crevasse splay (Figure 5). It consists of two prehistoric mounds and an associated habitation area; it measures approximately 50 m northeast-southwest by 160 m northwest-southeast, and it covers approximately 1.8 acres (Figure 7). A variety of vegetation, including live oak, water oak, black willow, hawthorne, sweet gum, palmetto, and briars, covers the site. Several borrow pits had been excavated at the site; fill from these pits was used to construct the adjacent dirt road, the bridge across the bayou, and the bridge across the man-made inlet located at the north end of the site. However, the borrow pits have impacted only a small portion of the site.

During the current project, the Bayou L'Ours Mounds site was relocated while conducting initial pedestrian survey and shovel testing of the project corridor. At that time, a large mound (Mound A; Figure 8) and a small mound (Mound B) were identified within the site; midden deposits also were identified (Figure 7). Although the proposed right-of-way avoided Mound A, the east edge of the project corridor passed through the center of Mound B, and traversed much of the habitation or midden area.

Additional testing at Bayou L'Ours Mounds (16LF54) was designed to delineate the site's horizontal and vertical extent, to ascertain its cultural components, to determine the site's archeological integrity, and to evaluate its research potential. During the testing phase, 37 shovel tests and eight auger tests were excavated throughout the site. Emphasis was placed on that portion of the site in the project corridor. The shovel tests were used to delineate site boundaries and to identify artifact concentrations. The auger tests confirmed the lack of deeply buried deposits within the site, and they provided soil

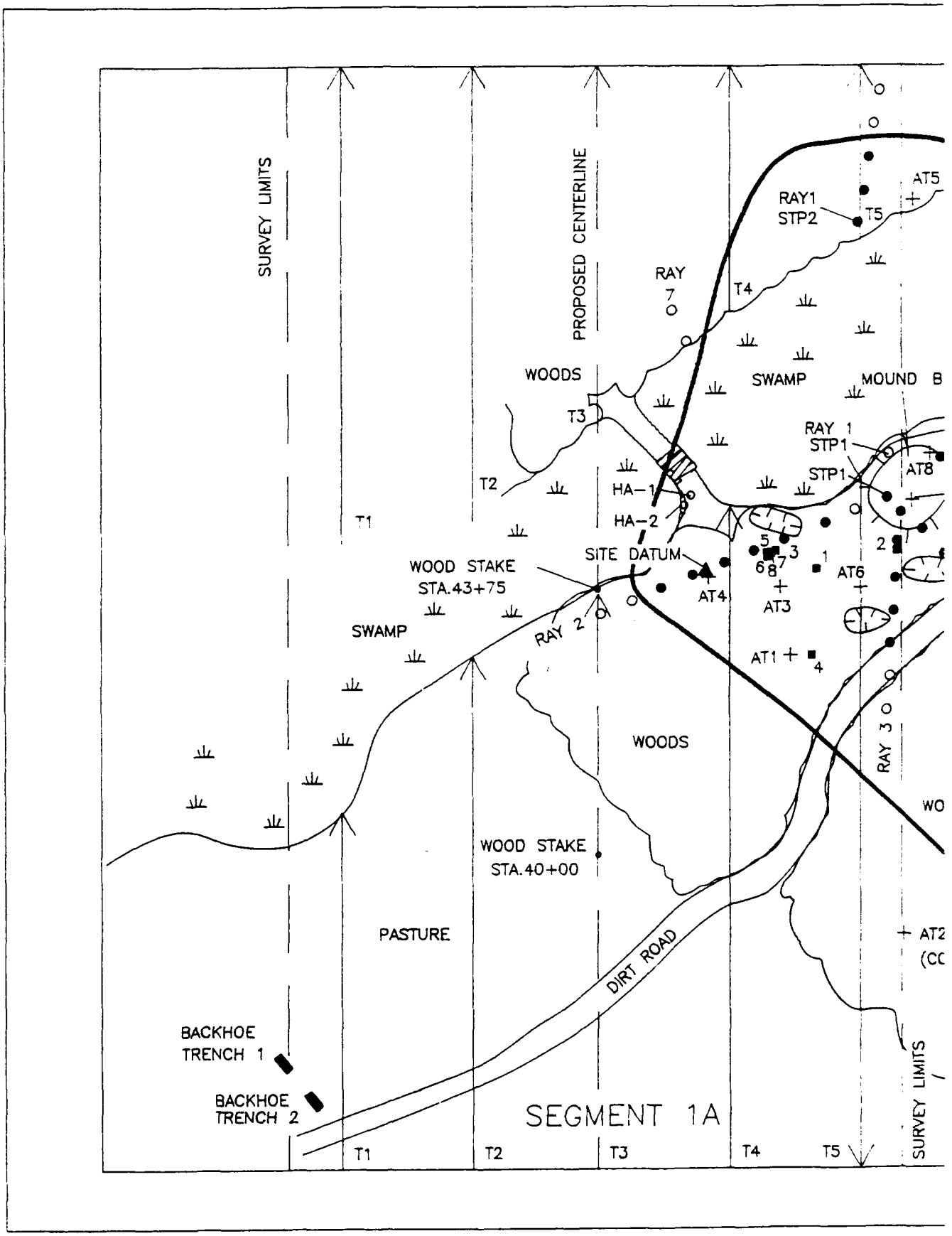
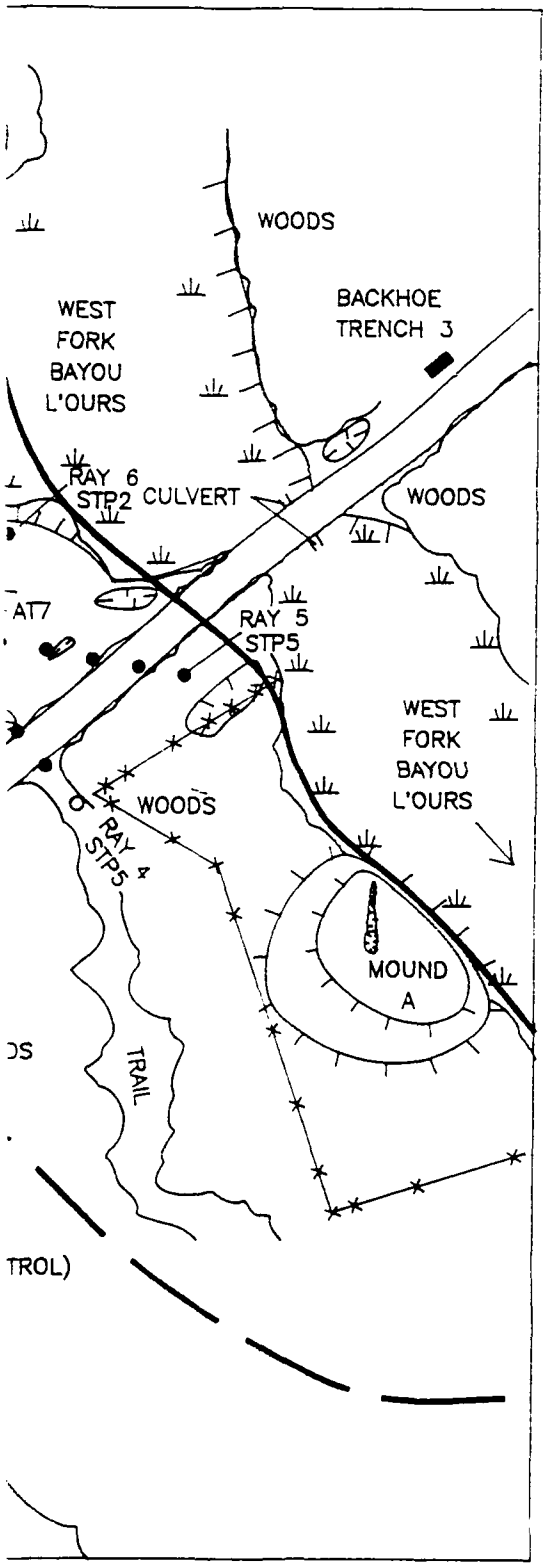


Figure 7. 16LF54 site plan

1 of 2



SITE MAP FOR BAYOU L'OURS MOUNDS 16LF54

- ● POSITIVE SHOVEL TEST
- o NEGATIVE SHOVEL TEST
- ■ TEST EXCAVATION UNIT
- \+ AUGER TEST
- o HA-1 SOIL CORE TEST
- SITE BOUNDARY
- PROBABLE SITE BOUNDARY
- TREELINE

N

0 50

METERS

2 of 2

Figure 8. View of Mound A at Bayou L'Ours Mound (16LF54), facing north

samples for orthophosphate testing. No deeply buried cultural deposits were located within the site. Results of orthophosphate testing are discussed more fully in Chapter VIII.

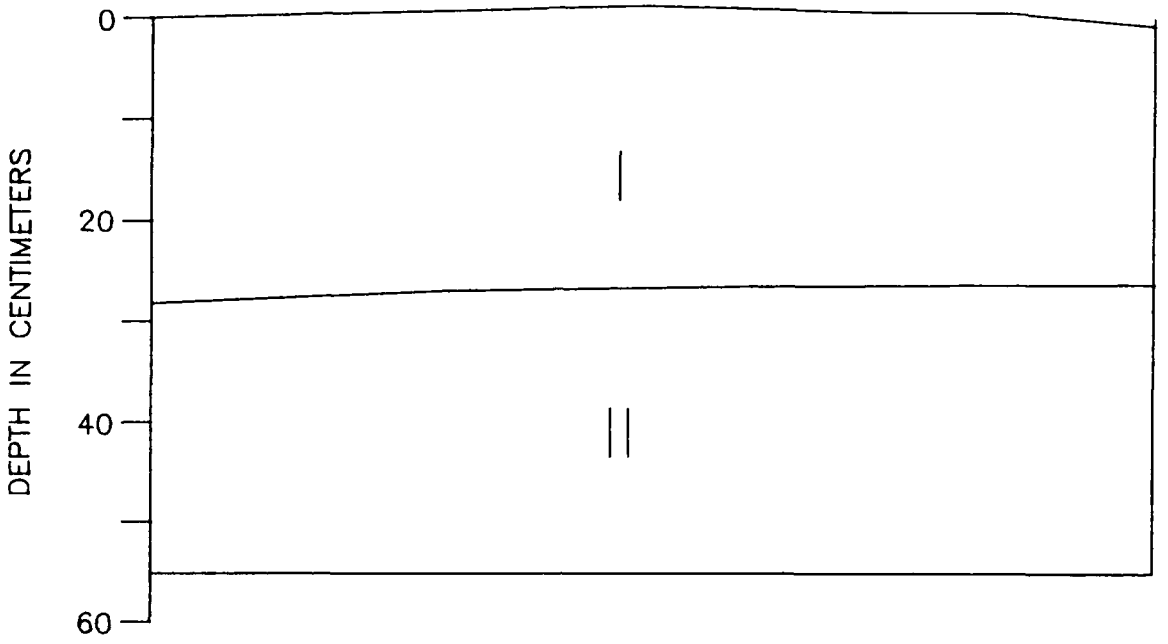
Eight excavation units were placed within the projected area of impact to the Bayou L'Ours Mounds (Figure 7). Placement of four of these, Units 1 through 4, was based on the results of shovel testing and on observed surface remains. The other four units, Units 5 through 8, were placed adjacent to Unit 3, to remove a burial identified in that unit.

Unit 1 was located on a slight rise 12 m southwest of Mound B, in an area with little surface shell expression, and within about 5 cm of armadillo surface disturbance. The unit was excavated in six levels containing two natural strata (Figure 9). Stratum I consisted of 10YR 3/1 very dark gray silty clay grading into a 10YR 4/1 dark gray silty clay. It contained numerous prehistoric pottery and bone fragments, a small amount of lithic debris, small charcoal fragments, and a small quantity of *Rangia cuneata* shells. Stratum II consisted of 10YR 5/1 gray clay mottled with 10YR 4/4 and 10YR 4/6 dark yellowish brown clay. It contained no cultural material. As a whole, soil deposits within Unit 1 were undisturbed, and they appeared to possess good archeological integrity. No features were present in the unit.

Unit 2 was placed 3 m south of Mound B (Figure 7). It was excavated in five levels which fell within two strata (Figure 10). Stratum I contained 10YR 3/1 very dark gray silty clay grading into 10YR 4/1 dark gray silty clay. It contained numerous ceramic sherds, along with bone fragments and *Rangia cuneata* shells. Level 2, and the top half of Level 3, both in Stratum I, contained a higher concentration of shell than Level 1. The highest concentrations were within the southeast quadrant of the unit. However, fewer pottery fragments and bones were located within these levels. Stratum II consisted of 10YR 5/1 gray clay mottled with 10YR 4/4 and 10YR 4/6 dark yellowish brown clay, and 10YR 3/2 very dark grayish brown clay. No cultural remains were recovered from Stratum II. While a higher concentration of shell was observed in the lower portion of Stratum I, no definable features were present.

Unit 4 was situated 25 m southwest of Mound B, towards the southwest edge of the site. It was excavated in four levels containing two natural strata (Figure 11). As with Units 1 and 2, Stratum I in Unit 4 consisted of 10YR 3/1 very dark gray silty clay grading into 10YR 4/1 dark gray silty clay. The upper half of the stratum, Level 1, contained no artifacts, and only two *Rangia cuneata* fragments. However, the lower half of the stratum (Level 2) contained approximately 100 ceramic sherds and some bone fragments. Stratum II, a 10YR 5/1 gray clay mottled with 10YR 4/4 dark yellowish brown clay, contained no cultural material. No features were found in Unit 4.

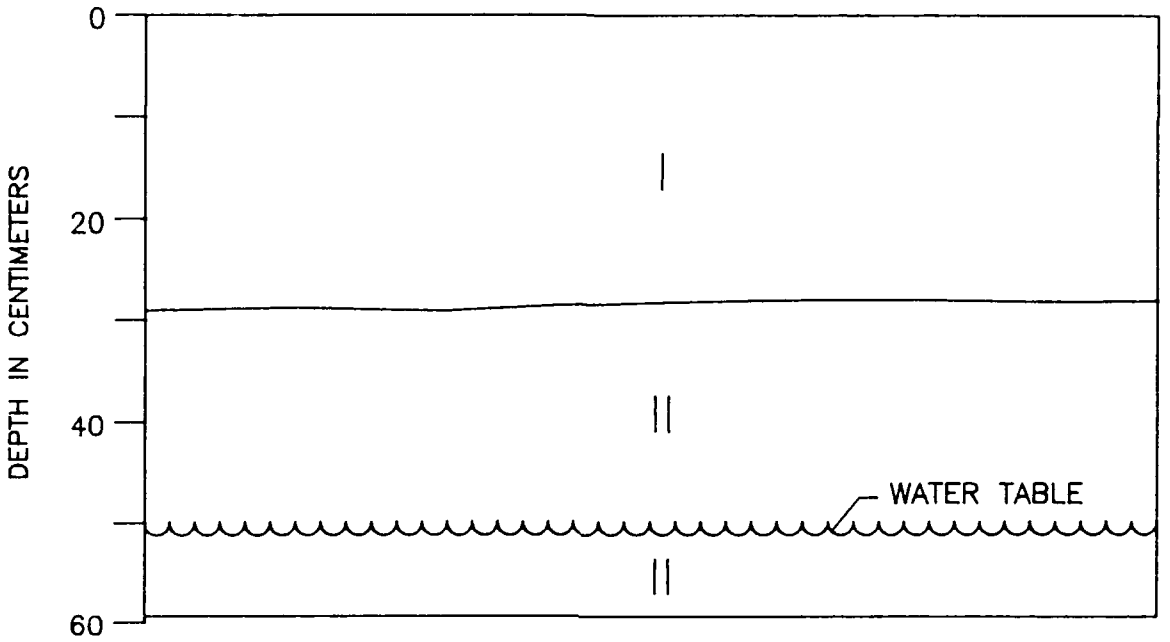
Unit 3 was situated 17 m west-southwest of Mound B, about 6 m south of the manmade inlet, and directly southeast of the bridge crossing the inlet (Figure 7). The unit



I: 10YR 3/1 VERY DARK GRAY TO
10YR 4/1 DARK GRAY SILTY CLAY.

II: 10YR 5/1 GRAY CLAY MOTTLED WITH
10YR 4/4 AND 10YR 4/6 DARK
YELLOWISH BROWN CLAY.

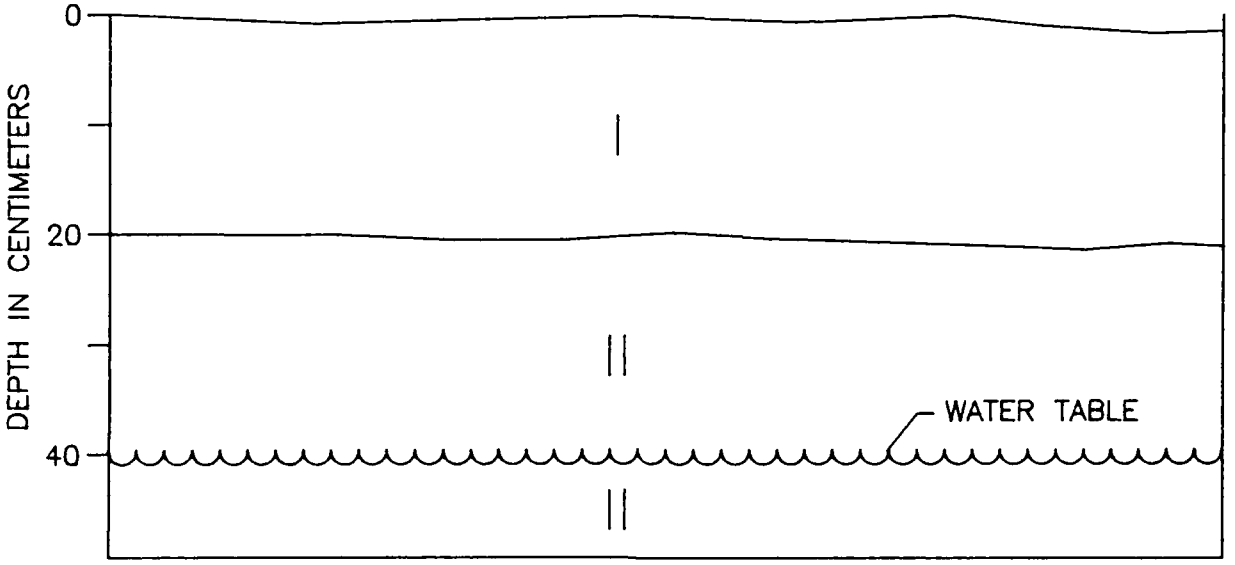
Figure 9. Unit 1 profile of west wall at 16LF54



I: 10YR 3/1 VERY DARK GRAY TO
10YR 4/1 DARK GRAY SILTY CLAY.

II: 10YR 5/1 GRAY CLAY, MOTTLED WITH
10YR 4/4 AND 10YR 4/6 DARK
YELLOWISH BROWN, AND 10YR 3/2
VERY DARK GRAYISH BROWN CLAY.

Figure 10. Unit 2 profile of north wall at 16LF54



I: 10YR 3/1 VERY DARK GRAY TO
10YR 4/1 DARK GRAY SILTY CLAY.

II: 10YR 5/1 GRAY CLAY MOTTLED WITH
10YR 4/4 DARK YELLOWISH BROWN CLAY.

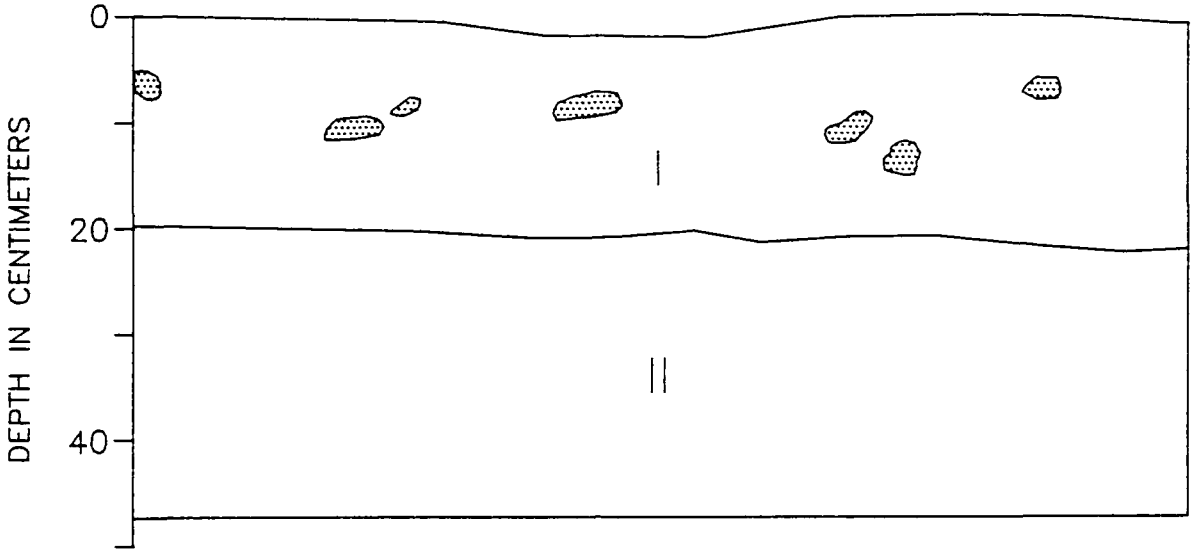
Figure 11. Unit 4 profile of south wall at 16LF54

was excavated in five levels containing two natural strata (Figure 12). Stratum I, a 10YR 3/1 very dark gray silty clay, contained ceramic sherds, faunal material, and *Rangia cuneata* shell fragments. Most of the ceramic sherds were recovered from the upper 10 cm level of the stratum. The quantity of faunal material increased in the second stratum; a majority of it was situated in the southwest quarter of the unit. In general, the faunal material was fragmentary and deteriorated. The skeletal remains from Unit 3 included a variety of human bone fragments. Human bones recovered from this unit represent the upper half of an individual skeleton, designated Burial 1. Harder bones, such as teeth and mandible fragments, were moderately well preserved. However, softer cancellous bones, such as the sternum, scapulae, vertebrae, and portions of the cranium, were very poorly preserved. Stratum II consisted of 10YR 5/1 gray clay mottled with 10YR 4/4 dark yellowish brown clay. It did not contain cultural deposits.

Four additional excavation units, Units 5 through 8, were placed along the south and west walls of Unit 3 to complete the excavation of Burial 1. Unit 5 measured 1 x 1 m. Unit 6 measured 0.5 x 1 m. Unit 7 was excavated as a 50 cm^2 unit. Unit 8 consisted of a 10 cm wide balk between Units 3 and 5 (Figure 13). Each unit was excavated in two levels to expose the burial. Fill surrounding the burial was excavated as one unit (Burial 1), as opposed to dividing it into the separate excavation units. Excavation stopped at the base of the burial. Stratigraphic profiles were drawn of all of these units except for Unit 8, the balk.

Unit 5 contained four strata (Figure 14). Distinctions between the first three strata were based on shell content, and on slight variations in soil texture. Stratum I consisted of a 10YR 3/1 very dark gray clayey loam, the same topsoil deposit which covers most of the site. Over 100 ceramic sherds were recovered from Stratum I, along with numerous animal bone fragments. Stratum II was characterized as a 10YR 3/1 very dark gray loamy clay containing a moderate concentration of *Rangia cuneata* shell fragments and other non-human faunal remains, and numerous prehistoric pottery fragments that occurred less frequently with depth. Stratum III consisted of a thin band of 10YR 3/1 very dark gray clay, from which a few pottery fragments, bones, and shells were recovered. Stratum IV, a 10YR 4/1 dark gray clay, contained a moderate quantity of artifacts, animal bone, and Burial 1. Most of Stratum IV was excavated with Burial 1, which is discussed below.

Unit 6 resembled Unit 5 both in stratigraphy and in its artifact content. Two strata were excavated within this unit (Figure 14). Stratum I consisted of 10YR 3/1 very dark gray clayey loam. Stratum II contained 10YR 3/1 very dark gray loamy clay, and it had more shell than Stratum I. Artifacts located within the two strata included numerous ceramic sherds and a moderate amount of animal bone, with artifact content decreasing towards the bottom of Stratum II. Fragmented deer antler was recovered from the south edge of Unit 6, near the bottom of Stratum II. Only a small portion of Burial 1 extended into the northwest edge of this unit.



I: 10YR 3/1 VERY DARK GRAY SILTY CLAY.

II: 10YR 5/1 GRAY CLAY MOTTLED WITH
10YR 4/4 DARK YELLOWISH BROWN CLAY.

SHELL

Figure 12. Unit 3 profile of south wall at 16LF54

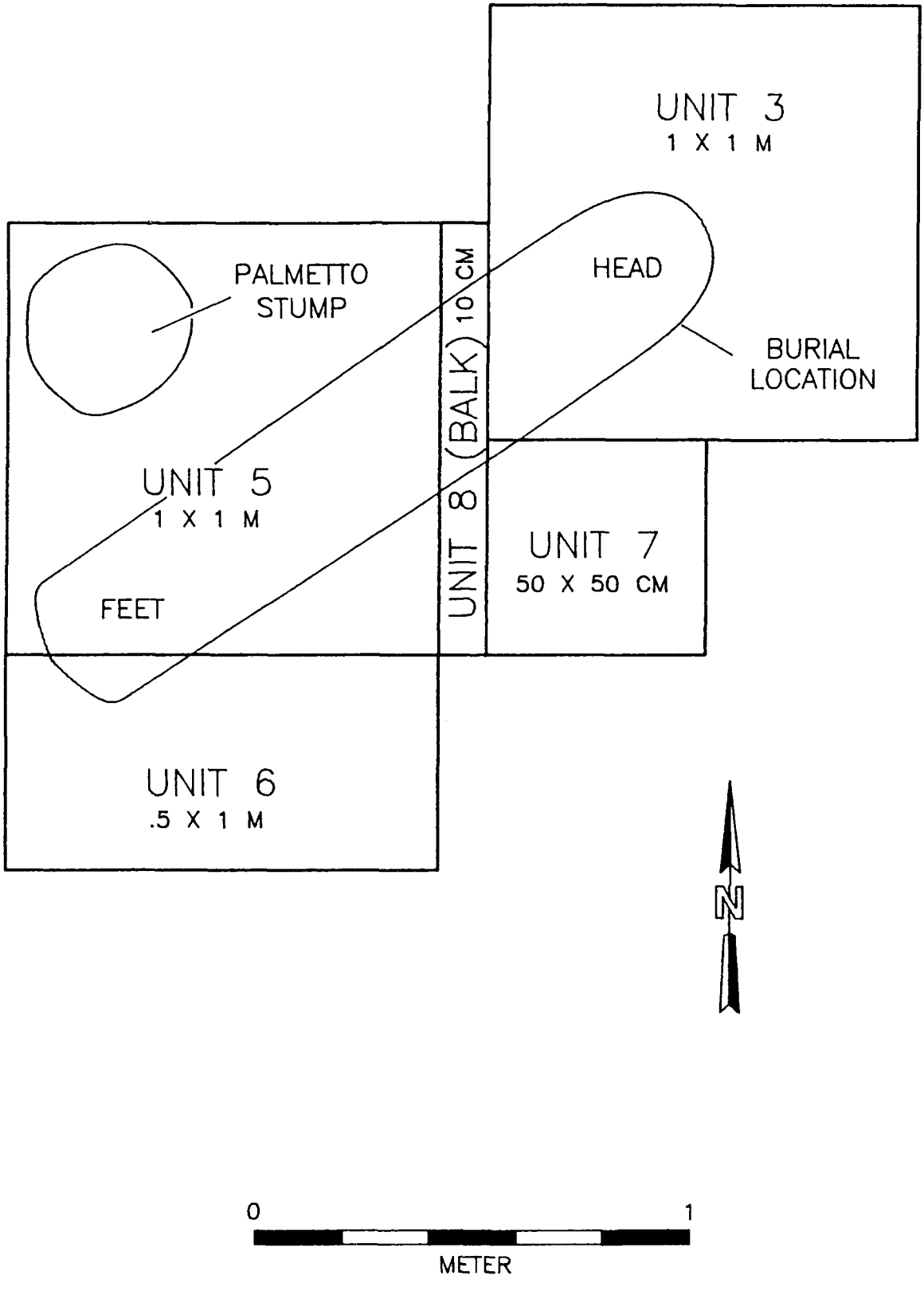
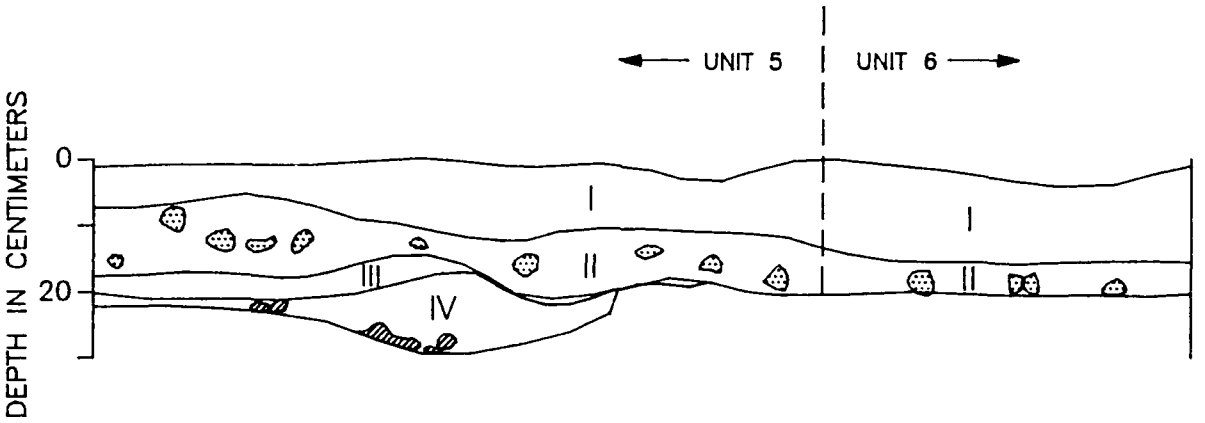


Figure 13. Plan view of Units 3, 5, 6, 7, 8, and Burial 1



I: 10YR 3/1 VERY DARK GRAY CLAYEY LOAM.

II: SHELL LENS IN 10YR 3/1 VERY DARK GRAY LOAMY CLAY.

III: 10YR 3/1 VERY DARK GRAY CLAY.

IV: 10YR 4/1 DARK GRAY CLAY.

SHELL HUMAN BONE

Figure 14. Unit 5 and Unit 6 profiles of east walls at 16LF5[4]

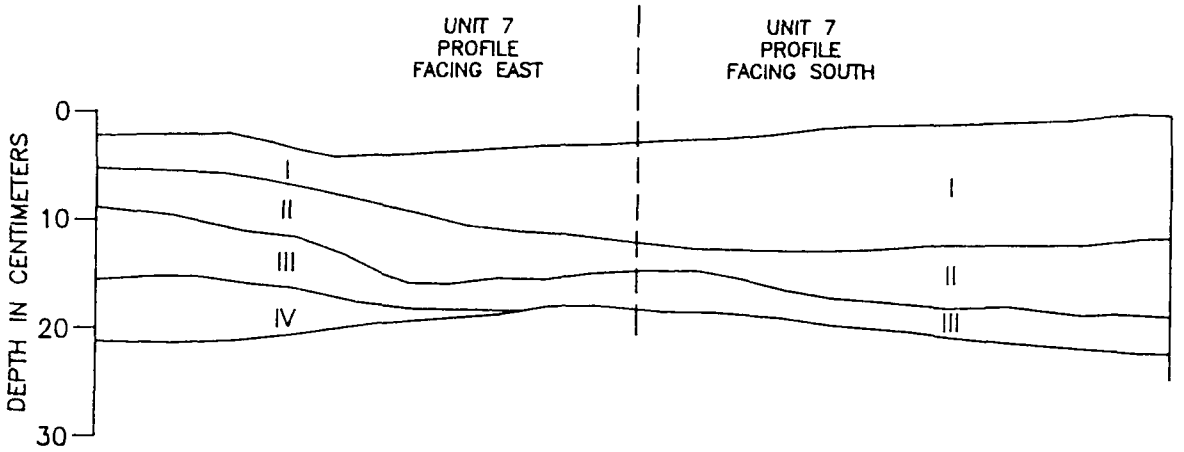
Unit 7 was situated directly south of the western half of Unit 3 (Figure 13). It was excavated to ensure exposure of the entire burial. The soils within this unit resembled those found in Units 5 and 6. Distinctions made between Strata I, II, and III were based on slight textural changes and on the varying amounts of shell, as opposed to soil color (Figure 15). Stratum I, a 10YR 3/1 very dark gray clayey loam, contained most of the cultural debris, including numerous ceramic sherds, and non-human faunal materials, including a light concentration of *Rangia cuneata* shell fragments. Stratum II consisted of 10YR 3/1 very dark gray loamy clay, with moderate shell concentrations and lower artifact and bone densities. Stratum III contained 10YR 3/1 very dark gray clay, with some shell fragments, and a few pottery and bone fragments. Stratum IV was excavated solely in the northeastern third of the unit; it consisted of 10YR 4/1 dark gray clay and contained no cultural materials. No faunal material was associated with Burial 1 in this unit.

During excavation of Units 5 and 7, and most of the exposure of Burial 1 (Figure 13), Unit 8, a 10 cm wide balk, was maintained west of Units 3 and 7, and east of Unit 5. Following recordation of Unit 5 and 6 stratigraphic profiles (Figure 14), and after photography of the balk, Unit 8 was removed in two levels. The stratigraphic sequence and artifact concentrations corresponded to those found in Unit 5. Burial 1 extended through Unit 8; soils, artifacts, and faunal materials associated with the burial were removed with the rest of the burial.

Burial 1 was cleaned, photographed, recorded, and removed (Figure 16). It was an extended burial, with the body laying face-down, and the hands underlying the pelvic region and the upper thighs. The body was oriented with the head towards the northeast. The bone condition varied, with highly calcified bones, such as the long bones, firm but in broken condition. The cancellous bones, such as the innominate, sacrum, coccyx, ribs, and vertebrae, were fractured and soft or non-existent.

There was no visible evidence of a graveshaft surrounding the burial, although the burial rested on undisturbed deposits 22 to 30 cm below ground surface. Several ceramic sherds were found within the vicinity of the burial. The Stratum II shell concentration, over the burial, appeared unbroken by any grave shaft, suggesting that the burial occurred prior to formation of the shell concentration, and possibly during the early occupation of the site. Data obtained during analysis of the skeletal material are presented in Chapter VIII.

Based on archeological testing at Bayou L'Ours Mounds (16LF54), the site appears to be a multicomponent local ceremonial center and village site situated along West Fork Bayou L'Ours. The site includes two mounds, in situ habitation debris, and at least one burial. No structural remains, such as postholes, were observed during the testing. However, only limited excavations were performed at the site. Overall, the site has good archeological integrity, although modern disturbances such as the inlet and the borrow pits, have damaged localized areas.



I: 10YR 3/1 VERY DARK GRAY CLAYEY LOAM.

II: SHELL LENS IN 10YR 3/1 VERY DARK GRAY LOAMY CLAY.

III: 10YR 3/1 VERY DARK GRAY CLAY.

IV: 10YR 4/1 DARK GRAY CLAY.

Figure 15. Unit 7 profile of east and south walls

Figure 16. Burial photomosaic

Locus of Modern Refuse

One locus of modern refuse was identified in the project area, at the southeast end of Segment 3. This locus contained refuse associated with a small single-cabin camp located directly northwest of the dirt road crossing the bayou in that vicinity. Visible evidence of the camp included a shed, a swing, burned remains of the cabin, and a considerable amount of modern refuse. According to Ted Dufrene, a nephew of the owner, the cabin burned on Thanksgiving Day, 1989 (Ted Dufrene, personal communication 1990). All of the artifacts observed in the vicinity of the camp were modern, dating from the 1970s and 1980s; no artifacts were collected.

CHAPTER VIII

LABORATORY ANALYSIS

Introduction

Nine hundred ninety-one prehistoric artifacts including 913 prehistoric ceramic sherds, 54 fired clay/clay object fragments, 21 fragments of daub, one chert primary cortex block/shatter fragment, one bone tool, and one charred, possibly worked wood fragment, were recovered from the Bayou L'Ours Mounds site (16LF54). Also collected were 227 animal bones, 11.8 kg of *Rangia cuneata* shell, 249.0 g of oyster shell, 1.2 g of unidentified shell fragments, seven pieces of wood, one waterworn pebble, one quartz crystal, and one charcoal fragment. All remains were washed and sorted into material categories. Finally, one human burial was excavated during site testing.

Prehistoric Ceramics from 16LF54

Prehistoric ceramic sherds were sorted by temper, portion of vessel, and surface finish. Sherds were analyzed using types identified by Phillips (1970) and Jones (1985). Ceramic sherds recovered from 16LF54 consisted of undecorated types (plain) and decorated types (incised, punctated, and painted/slipped) (Figures 17 and 18). Incised types of prehistoric ceramic sherds included French Fork Incised *var. French Fork*, Coles Creek Incised *var. Coles Creek*, Coles Creek Incised *var. Blakely*, L'eau Noire Incised *var. Anna*, L'eau Noire Incised *var. L'eau Noire*, Barton Incised *var. Estill*, Coleman Incised *var. Coleman*, Leland Incised var. Leland, Leland Incised *var. unspecified*, and Winterville Incised *var. unspecified*. French Fork Incised *var. French Fork* ceramics probably were manufactured between the Troyville and Coles Creek periods. Coles Creek Incised varieties were used from the beginning of the Baytown period to the middle of the Mississippian period (Phillips 1970). Coles Creek Incised *var. Coles Creek* appeared throughout the Coles Creek period, and Coles Creek Incised *var. Blakely*, appeared during the late Coles Creek period. L'eau Noire Incised *var. Anna*, L'eau Noire Incised *var. L'eau Noire,* and Coleman Incised *var. Coleman* date from the Mississippian period. Winterville incised varieties and Leland incised varieties date from the late to the terminal Mississippian period. Leland Incised *var. Leland* ceramics and Barton Incised *var. Estill* ceramics date from the late Mississippian period.

Punctated types of prehistoric ceramic sherds from the site included Evansville Punctated *var. Braxton*, Evansville Punctated *var. Evansville*, Evansville Punctated *var. Rhinehart,* Churupa Punctated *var. Churupa*, Parkin Punctated *var. Hollandale, and* Pocahontas Punctated *var. Pocahontas*. Evansville Punctated *var. Braxton* ceramics date from the "late Marksville and/or early Baytown period" (Phillips 1970:79). Evansville Punctated *var. Evansville* ceramics date from Marksville through Coles Creek. Evansville

Figure 17. Selected Marksville/Baytown, Marksville/Coles Creek, and Baytown period ceramic sherds from 16LF54 - (a) Churupa Punctated *var. Churupa* with apatite inclusions (Unit 2, Level 1); (b) Evansville Punctated *var. Braxton* (Unit 5, Level 2); (c) Churupa Punctated *var. Churupa* (Unit 8, Level 1); (d) Evansville Punctated *var. Evansville* (Ray 5, Shovel Test 5); (e) Quafalorma Red and White *var. Quafalorma* (Ray 3, Shovel Test 1); (f) Baytown Plain *var. unspecified* with "six mile" treatment (Unit 5, Level 2)

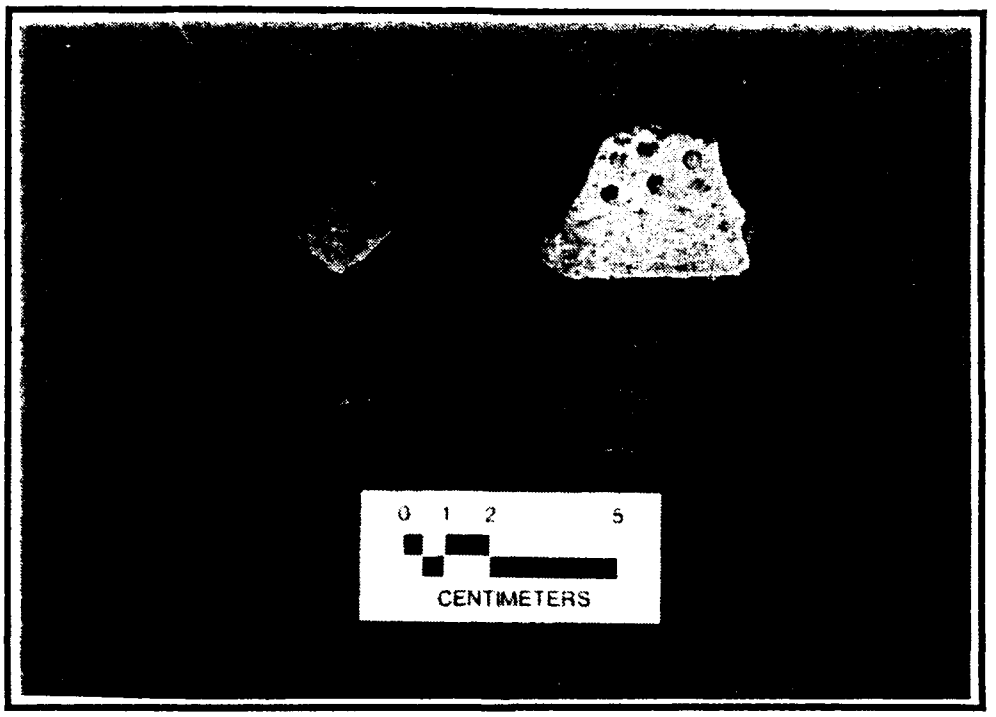


Figure 18. Selected Troyville/Coles Creek, and Coles Creek periods ceramic sherds from 16LF54 - (a) French Fork Incised *var. French Fork* (Unit 2, Balk under root); (b) Evansville Punctated *var. Rhinehart* (Unit 6, Level 1); (c) Coles Creek Incised *var. Coles Creek* (Unit 5, Level 2); (d) Coles Creek Incised *var. Blakely* (Unit 6, Level 1).

Punctated *var. Rhinehart* ceramics were used during the Coles Creek period. Churupa Punctated *var. Churupa* dates from the Marksville period to "a good deal beyond" the Troyville period (Phillips 1970:68). Parkin Punctated *var. Hollandale* dates from the late Mississippi period, while Pocahontas Punctated *var. Pocahontas* occurred during the terminal Mississippi and Contact periods.

Painted/Slipped prehistoric ceramic sherd types included Larto Red *var. Larto* and Quafalorma Red and White *var. Quafalorma*. One engraved type was collected, Maddox Engraved *var. unspecified*. The painted/slipped ceramic sherd types Larto Red *var. Larto* and Quafalorma Red and White *var. Quafalorma* date from the Baytown period. Maddox Engraved varieties date from middle to late Mississippian times.

Plain ceramic sherd types included Baytown Plain *var. Little River*, Baytown Plain *var. Percy Creek*, Baytown Plain *var. Addis*, Baytown Plain *var. unspecified*, Bell Plain *var. St. Catherine*, and Mississippi Plain *var. Pocahontas*. Baytown Plain varieties date from Marksville to Historic Contact; Baytown Plain varieties recovered from 16LF54 date from Troyville/Coles Creek (Baytown Plain *var. Little River*), Coles Creek (Baytown Plain *var. Percy Creek*), and Mississippi periods (Baytown Plain *var. Addis*). Bell Plain *var. St. Catherine* dates from the terminal Mississippi period. Mississippi Plain varieties also were recorded. Mississippi Plain *var. Pocahontas* dates from the terminal Mississippian to European Contact.

Several decorated and undecorated sherds were too small or too deteriorated to identify by type. These sherds were classified as unidentified incised, unidentified punctated, unidentified brushed, unidentified slipped/painted, unidentified decorated, and unidentified plain. Among the unidentified plain, a total of 14 were shell/sand tempered examples. Two shell/sand tempered unidentified incised sherds were among the unidentified incised sherds. These shell/sand tempered sherds exhibited medium fine to coarse tempering particles. Together they represent an unidentified intrusive element within the ceramic collection, thought to originate in the east, either in Alabama or in the Pensacola, Florida region (Figure 19).

Surface Collection

Thirty-seven prehistoric ceramic sherds (Table 3), one chert primary cortex block/shatter fragment, and one waterworn pebble were recovered during surface collection. In addition, a sample of *Rangia cuneata* shell (32.6 g) was collected.

The prehistoric ceramic sherd collection included seven sherds of Baytown Plain *var. Percy Creek*, five sherds of Baytown Plain *var. Addis*, and six Baytown Plain *var. unspecified* sherds. Slipped/Painted types included six sherds of Quafalorma Red and White *var. Quafalorma*, and one Larto Red *var. Larto* sherd. Three Bell Plain *var. St. Catherine* sherds were recovered, as well as three unidentified plain sherds, one

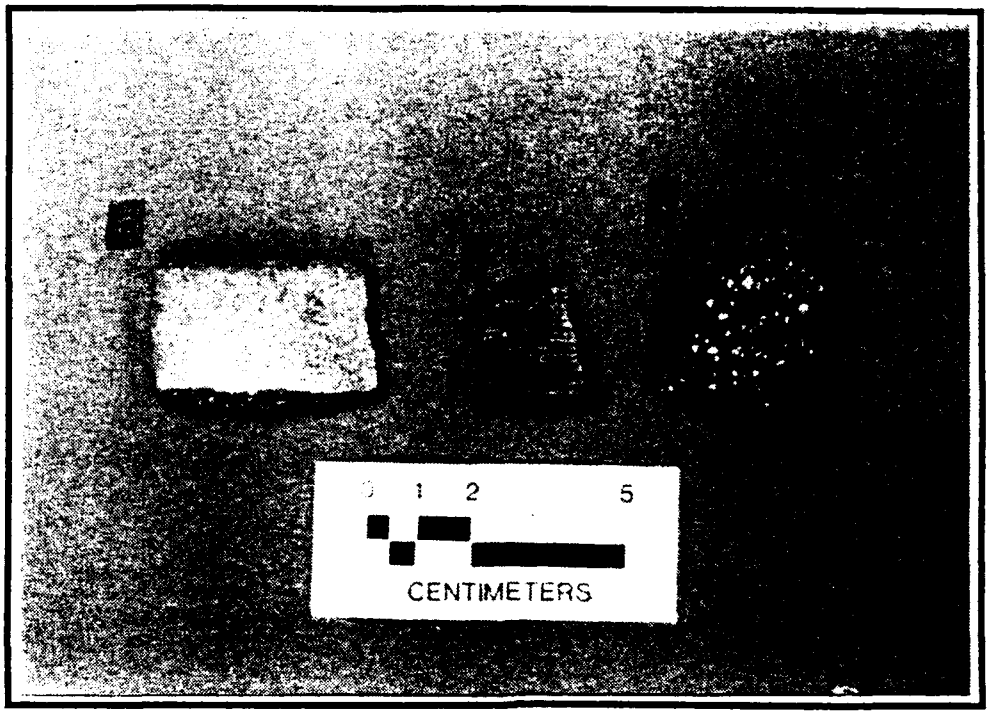


Figure 19. Selected sand, and sand and shell-tempered ceramic sherds from 16LF54, Unit 5, Level 1 - (a) sand and shell-tempered plain (b) sand-tempered incised (c) sand and shell-tempered incised/brushed.

Table 3

PRESHISTORIC CERAMIC TYPES RECOVERED DURING SURFACE COLLECTION AND SHOVEL TESTING AT SITE 16LF54

	Surface Collection	Shovel Tests
Baytown Plain *var. Percy Creek*	7	22
Baytown Plain *var. Addis*	5	44
Baytown Plain *var. unspecified*	6	29
Quafalorma Red and White *var. Quafalorma*	6	18
Larto Red *var. Larto*	1	4
Evansville Punctated *var. Evansville*		1
Evansville Punctated *var. Rhinehart*		1
Coles Creek Incised *var.* unspecified		2
Leland Incised *var. unspecified*		1
Barton Incised *var. Estill*		1
Winterville Incised *var. unspecified*		1
Bell Plain *var. St. Catherine*	3	10
Unidentified Plain	3	17
Unidentified Punctated		3
Unidentified Incised	1	
Daub		9
Eroded/Spalled Sherds	5	42
Total	**37**	**205**

unidentified incised sherd, and five eroded/spalled sherds. All of the sherds were grog tempered.

Shovel Testing

Shovel testing produced 196 prehistoric ceramic sherds and nine daub fragments (Table 3), one piece of charred, possibly worked wood, one palmetto wood fragment, and 49 animal bones. Samples of oyster shell (5.7 g) and *Rangia cuneata* shell (1.2 kg) also were collected.

Prehistoric sherd types recovered from shovel tests dated from the Baytown through the Mississippian periods. However, one of the Baytown Plain *var. unspecified* sherds may represent Baytown Plain *var. Marksville*, a Marksville period variety. Sherd types included 44 Baytown Plain *var. Addis*, 22 Baytown Plain *var. Percy Creek,* and 29 Baytown Plain *var. unspecified* (Table 3).

Eighteen sherds of Quafalorma Red and White *var. Quafalorma* and four Larto Red *var. Larto* sherds were collected, as were one sherd each of Evansville Punctated *var. Evansville*, Evansville Punctated *var. Rhinehart*, Leland Incised *var. unspecified*, Barton Incised *var. Estill*, and Winterville Incised *var. unspecified*. Two sherds of Coles Creek Incised *var. unspecified*, 10 Bell Plain *var. St. Catherine* sherds, 17 unidentified plain sherds, and three unidentified punctated sherds also were recovered. Forty-two eroded/spalled sherds and nine daub fragments complete the shovel test ceramic inventory.

One recovered sherd of Bell Plain *var. St. Catherine* displayed characteristics such as incising, and a thickened rim; these traits usually are associated with Bell Plain *var. Bell* ceramics, found throughout the northern Yazoo River basin. Bell Plain *var. Holly Bluff* bowls recovered from the southern Yazoo River valley also exhibit incised and thickened rims (called a "Haynes Bluff" rim). However, both Bell Plain *var. Bell* and Bell Plain *var. Holly Bluff* ceramics are tempered primarily with crushed shell. The recovered sherd was grog tempered, an agent more likely associated with Bell Plain *var. St. Catherine*; this variety of ceramic also occurs farther south, "from a little below Vicksburg down to the vicinity of Baton Rouge" (Phillips 1970:60-61).

The Winterville Incised sherd was shell tempered; the sherd of Barton Incised was shell/sand tempered, as was the Leland Incised sherd. Five unidentified plain sherds were shell/sand tempered, and one unidentified plain sherd was shell tempered. All of the other sherds recovered during shovel testing were tempered with grog. Animal bone fragments recovered included bird (n=4), small mammal (n=18), large mammal (n=2), fish (n=1), alligator (*Alligator mississippiensis)* (n=6), and unidentified fragments (n=18).

Auger Testing

Eight auger tests were placed within site 16LF54, particularly in the area that fell within the project corridor. Soil samples were collected for phosphate testing. The phosphate testing produced several high readings confirming human occupation within the site area.

Test Unit Results

Unit 1

Eighty-one prehistoric ceramic sherds and nine daub fragments (Table 4), one large mammal bone fragment, and one piece of charcoal were recovered from Unit 1. Level 1 contained 30 prehistoric ceramic sherds, including eight Baytown Plain *var. Addis*, two Baytown Plain *var. Percy Creek*, and three Baytown Plain *var. unspecified*. Seven sherds of unidentified plain, two unidentified incised sherds, eight eroded/spalled sherds, and five pieces of daub also were collected.

Thirty-four prehistoric sherds were collected from Level 2. These included seven Baytown Plain *var. Addis,* two Baytown Plain *var. Percy Creek*, and two Baytown Plain *var. unspecified* sherds. Two types of painted/slipped sherds were recovered: two Quafalorma Red and White *var. Quafalorma*, and two Larto Red *var. Larto.* Four pieces of Bell Plain *var. St. Catherine*, four unidentified plain sherds, 11 eroded/spalled sherds, and four pieces of daub also were recovered. One large mammal bone fragment also was collected.

Only eight prehistoric sherds were recovered from Level 3, including two Baytown Plain *var. Percy Creek*, two unidentified plain sherds, and four eroded/spalled sherds. One piece of charcoal (0.45 g) also was collected. A weight of 1.0 gram is considered to be the minimum sample amount for radiocarbon dating, with 8 - 12 grams being the preferred amount (Michels 1973). Therefore, the charcoal sample recovered from Level 3 was too small to submit for radiocarbon dating. All of the Unit 1 sherds were grog tempered except for one sand tempered eroded/spalled sherd.

Level 1 sherds date from the Coles Creek (Baytown Plain *var. Percy Creek* through Mississippian periods (Baytown Plain *var. Addis*, Bell Plain *var. St. Catherine*). Level 2 sherds range from the Baytown (Larto Red *var. Larto*, Quafalorma Red and White *var. Quafalorma*) through the Mississippian periods (Baytown Plain *var. Addis* and Bell Plain *var. St. Catherine*). Sherds from Level 3 date from the Coles Creek period (Baytown Plain *var. Percy Creek*). The chronological range represented by ceramics from this unit suggests a multi-component site.

Table 4

PREHISTORIC CERAMIC TYPES RECOVERED FROM SITE 16LF54, UNIT 1

	Level 1	Level 2	Level 3	Total	Per cent
Baytown Plain *var. Percy Creek*	2	2	2	6	7.4
Baytown Plain *var. Addis*	8	7		15	18.5
Baytown Plain *var. unspecified*	3	2		5	6.2
Larto Red *var. Larto*		2		2	2.5
Quafalorma Red and White *var. Quafalorma*		2		2	2.5
Bell Plain *var. St. Catherine*		4		4	4.9
Unidentified Plain	7	4	2	13	16.0
Unidentified Incised	2			2	2.5
Daub	5	4		9	11.1
Eroded/Spalled Sherds	8	11	4	23	28.4
Total	**35**	**38**	**8**	**81**	**100.0**

Unit 2

Sixty-six prehistoric ceramic sherds and ten fired clay/clay object fragments (Table 5), one small mammal bone, and three unidentified animal bones were collected from Unit 2. Samples of *Rangia cuneata* shell (350.1 g) also were taken from the three levels and the balk.

Level 1 produced 35 prehistoric ceramic sherds, including 12 Baytown Plain *var. Addis*, two Baytown Plain *var. Percy Creek*, and three Baytown Plain *var. unspecified*. One Baytown Plain *var. Addis* rim sherd displayed remains of a decorative lug. One Churupa Punctated *var. Churupa* sherd was collected from Level 1. This sherd was tempered with grog, and it exhibited blue-green inclusions on the surface, which may be accidental.

Analysis under a scanning electron microscope, including backscatter electron image (BEI) and energy dispersive system (EDS) analysis, as well as a semi-quantitative analysis revealed that the blue-green inclusions found within one of the pot sherds consisted of calcium phosphate, most likely the mineral apatite. There are two possible sources of pure calcium phosphate, sedimentary deposits and uroliths (gall stones, kidney stones). Calcium phosphate also occurs as an accessory mineral in some igneous and metamorphic rocks (McConnell 1973). Only about two per cent of the sand of the Mississippi River system contains apatite. Furthermore, this small percentage of apatite is inaccessible because it is limited to the bottom of the river (Russell 1937). Both Coleman (1966) and Robert (1985) indicate that iron carbonate, calcium carbonate, and iron phosphate are the common diagenetic minerals found in deltaic sediments of the Mississippi River. However, calcium phosphate has not been found as a natural diagenetic or detrital mineral in these sediments. The closest source of abundant apatite deposits, then, is Florida.

Given that there were no obvious pieces of crushed rock in the sherd, the source of the apatite inclusions probably was either sedimentary or biogenic. If sedimentary, the sherd may have originated from a pot manufactured in Florida. The apatite may have entered the clay as an accidental inclusion. Churupa Punctated *var. Churupa* is found throughout the lower Mississippi Valley, so the potter would have been familiar with this particular design.

Four Quafalorma Red and White *var. Quafalorma* sherds, two unidentified plain sherds, one sherd of unidentified incised, and one unidentified decorated sherd also were collected from Level 1. Nine eroded/spalled sherds and four pieces of fired clay also were recovered. All of the sherds from Level 1 (excluding fired clay) were grog tempered, excluding the two unidentified plain sherds, which were grog/sand tempered and sand/shell tempered, respectively. A sample of *Rangia cuneata* shell (5.5 g) also was collected from Level 1.

Table 5

PREHISTORIC CERAMIC TYPES RECOVERED FROM SITE 16LF54, UNIT 2

	Level 1	Level 2	Level 3	Balk Underroot	Total	Per cent
Baytown Plain *var. Percy Creek*	2	3	1	1	7	9.2
Baytown Plain *var. Addis*	12	2	3	1	18	23.7
Baytown Plain *var. unspecified*	3	3	2		8	10.5
Churupa Punctated *var. Churupa*	1				1	1.3
Quafalorma Red and White *var. Quafalorma*	4	3		1	8	10.5
French Fork Incised *var. French Fork*				1	1	1.3
Bell Plain *var. St. Catherine*		2			2	2.6
Unidentified Plain	2	1	3		6	8.0
Unidentified Incised	1				1	1.3
Unidentified Decorated	1				1	1.3
Fired Clay/Clay Object	4	1	4	1	10	13.2
Eroded/Spalled Sherds	9	2		2	13	17.1
Total	**39**	**17**	**13**	**7**	**76**	**100.0**

Level 2 yielded 16 prehistoric ceramic sherds including three sherds of Baytown Plain *var. Percy Creek*, two sherds of Baytown Plain *var. Addis*, and three sherds of Baytown Plain *var. unspecified.* Three sherds of Quafalorma Red and White *var. Quafalorma*, two Bell Plain *var. St. Catherine* sherds, one sherd of unidentified plain, two eroded/spalled sherds, and one piece of fired clay also were collected. All but one sherd, a sand/shell tempered unidentified plain sherd, were grog tempered. The fired clay was untempered. One small mammal bone and a sample of *Rangia cuneata* shell (14.3 g) also were collected from Level 2.

Nine ceramic sherds were recovered from Level 3. These included three Baytown Plain *var. Addis* sherds, two Baytown Plain *var. unspecified* sherds, and one piece of Baytown Plain *var. Percy Creek*. Three unidentified plain sherds and four pieces of fired clay complete the ceramic collection from this level. One unidentified plain sherd was grog/sand tempered, while the rest were grog tempered. The fired clay was untempered and may be fragments of clay objects. Three unidentified animal bones and a sample of *Rangia cuneata* shell (328.8 g) also were collected from Level 3.

Six ceramic sherds were recovered from a balk removed beneath a root growing within Unit 2. The ceramic types recovered included one Baytown Plain *var. Percy Creek,* one Baytown Plain *var. Addis*, one Quafalorma *var. Quafalorma*, and one French Fork Incised *var. French Fork*. Two eroded/spalled sherds and one piece of fired clay, possibly a clay object fragment, were collected in addition to a sample of *Rangia cuneata* shell (1.5 g). All of the ceramic sherds were grog tempered.

Ceramic types recovered from Level 1 date from the Marksville (Churupa Punctated *var. Churupa*) to Baytown and Coles Creek periods (Quafalorma Red and White *var. Quafalorma*, Baytown Plain *var. Percy Creek*), and later (Baytown Plain *var. Addis*). Churupa Punctated *var. Churupa* also was used after the Troyville period.

Level 2 ceramic types range from the Baytown (Quafalorma Red and White *var. Quafalorma*), Coles Creek (Baytown Plain *var. Percy Creek*), Mississippian and terminal Mississippian periods (Baytown Plain *var. Addis*, Bell Plain *var. St. Catherine*). Ceramic sherds recovered from Level 3 date from the Coles Creek and Mississippian periods.

With the exception of one sherd, the Churupa Punctated *var. Churupa* sherd, all ceramic sherds recovered from Unit 2 date from the Baytown period through the Mississippian period. The Churupa Punctated *var. Churupa* sherd recovered from Level 1 may date from the Marksville period.

Unit 3

One hundred and sixteen ceramic sherds and 15 fired clay/clay object fragments (Table 6), four wood ecofacts, and six animal bones were collected from three levels in

Table 6

PREHISTORIC CERAMIC TYPES RECOVERED FROM SITE 16LF54, UNIT 3

	Level 1	Level 2	Level 3	Total	Per cent
Baytown Plain *var. Percy Creek*	8			8	6.1
Baytown Plain *var. Addis*	18	3		21	16.0
Baytown Plain *var. unspecified*	17	8		25	19.0
Churupa Punctated *var. Churupa*	1			1	0.8
Quafalorma Red and White *var. Quafalorma*	26			26	19.8
Larto Red *var. Larto*	2			2	1.5
Coles Creek Incised *var. Blakely*	1			1	0.8
L'eau Noire Incised *var. L'eau Noire*	1			1	0.8
Bell Plain *var. St. Catherine*	2	2		4	3.0
Unidentified Plain	11			11	8.4
Unidentified Incised	2			2	1.5
Unidentified Incised and Slipped	1			1	0.8
Unidentified Slipped/Painted	1			1	0.8
Fired Clay/Clay Object	11	3	1	15	11.5
Eroded/Spalled Sherds	8	4		12	9.2
Total	**110**	**20**	**1**	**131**	**100.0**

Unit 3. Samples of *Rangia cuneata* shell (10.3 kg total), oyster shell (243.3 g), and unidentified shell (1.2 g total) also were collected.

The majority (n=110) of the prehistoric ceramic materials came from Level 1. These included 18 sherds of Baytown Plain *var. Addis*, 8 Baytown Plain *var. unspecified* sherds, and 17 Baytown Plain *var. unspecified* sherds. Twenty-six Quafalorma *var. Quafalorma* sherds, two Larto Red *var. Larto* sherds, and one Churupa Punctated *var. Churupa* sherd were collected, as was one sherd of Coles Creek Incised *var. Blakely*, one L'eau Noire Incised *var. L'eau Noire* sherd, and two sherds of Bell Plain *var. St. Catherine*. Eleven unidentified plain sherds, two unidentified incised sherds, one unidentified slipped/painted sherd, one unidentified incised and slipped sherd, eight eroded/spalled sherds, and 11 pieces of untempered fired clay also were recovered. Five fired clay pieces may be clay object fragments. All of the sherds were grog tempered except for three unidentified plain sherds, one unidentified incised sherd, and the one unidentified slipped/painted sherd, all of which were shell/sand tempered. The Churupa Punctated *var. Churupa* sherd did not have the blue-green apatite inclusions noted for the same variety sherd found in Unit 2.

Six animal bones were collected from Level 1, Unit 3. These included two fish bones, two bird bones, one opossum (*Didelphis* sp.) jaw fragment, and one unidentified burned animal bone fragment. In addition, a sample of *Rangia cuneata* shells (7.2 kg), a sample of oyster shells (201.1 g), and one wood fragment were collected.

Level 2 yielded 17 sherds including three Baytown Plain *var. Addis* sherds, eight Baytown Plain *var. unspecified* sherds, two Bell Plain *var. St. Catherine* sherds, and four eroded/spalled sherds. Three pieces of fired clay also were collected. All of the Level 2 sherds were grog tempered. Samples of *Rangia cuneata* shell (2.8 kg) and oyster shell (18.2 g) were collected, as were four palmetto wood fragments, and one unidentified wood fragment. Level 3 contained only one piece of fired clay. A sample of *Rangia cuneata* shell (328.7 g) also was collected.

Ceramic sherd types recovered from Level 1 date from the Marksville (Churupa Punctated *var. Churupa*), the Baytown (Larto Red *var. Larto*, Quafalorma Red and White *var. Quafalorma*) Coles Creek (Coles Creek *var. Blakely*, Baytown Plain *var. Percy Creek*), Mississippian (L'eau Noire Incised *var. L'eau Noire*), and terminal Mississippian period (Bell Plain *var. St. Catherine*). Level 2 ceramics date solely from the Mississippian period (Baytown Plain *var. Addis*, Bell Plain *var. St. Catherine*.

Like Unit 2, the Churupa Punctated *var. Churupa* sherd represents the only ceramic type collected from Unit 3 that may date outside the Baytown to Mississippian time frame. However, as noted before, use of Churupa Punctated *var. Churupa* ceramics extended from Marksville to after the Troyville period Unlike the previous specimen, no inclusions on this sherd suggest an early date.

Unit 4

Ninety-six prehistoric ceramic sherds, 3 daub fragments (Table 7), and four animal bone fragments were collected from Levels 2 and 3 in Unit 4. No artifacts were recovered from Level 1, but a small sample (2.3 g) of *Rangia cuneata* shell was collected.

Level 3 contained one shell/grog tempered unidentified incised sherd; the remaining 95 sherds were collected in Level 2. Level 2 contained 10 Baytown Plain *var. Addis* sherds, two pieces of Baytown Plain *var. Percy Creek*, and seven sherds of Baytown Plain *var. unspecified*. The seven Baytown Plain *var. unspecified* sherds may have originated from the same vessel. Eight sherds of Quafalorma *var. Quafalorma*, two Coles Creek Incised *var. Coles Creek* sherds, and eight sherds of L'eau Noire Incised *var. Anna* also were recovered.

Thirty unidentified plain sherds also were collected from Level 2. Seventeen of those possibly came from the same vessel. Twelve unidentified plain sherds may be Baytown Plain *var. unspecified* sherds that are related to the seven Baytown Plain *var. unspecified* sherds noted previously. The final unidentified plain sherd could not be attributed to any one vessel.

Three unidentified incised sherds were recovered; they may be related to the 17 associated unidentified plain sherds mentioned previously. One unidentified decorated sherd, 24 eroded/spalled sherds, and three pieces of daub also were recovered from Level 2. All of the Level 2 ceramic sherds were grog tempered. Finally, one alligator bone fragment, one partial muskrat (*Ondatra sp.)* jaw with teeth, and two unidentified animal bones also were collected from Level 2.

The ceramic sherd types present in Unit 2 range in age from Baytown (Quafalorma Red and White *var. Quafalorma*), Coles Creek (Baytown Plain *var. Percy Creek*, Coles Creek Incised *var. Coles Creek*), and the Mississippi periods (Baytown Plain *var. Addis*, L'eau Noire Incised *var. Anna*). Like Unit 3, the ceramic types suggest a multi-component site.

Unit 5

One hundred and fifty-two prehistoric ceramic sherds, 19 fired clay/clay object fragments (Table 8), and 89 animal bones were collected from two levels in Unit 5. Level 1 contained 91 prehistoric ceramic sherds, 12 fired clay/clay object fragments, 44 animal bone fragments, and one bone tool. Level 2 produced 61 prehistoric ceramic sherds, seven fired clay/clay object fragments, and 44 animal bone fragments.

The Level 1 prehistoric ceramic collection included 22 sherds of Baytown Plain *var. Addis*, 20 Baytown Plain *var. Percy Creek* sherds, and five Baytown Plain *var. unspecified* sherds. Sixteen sherds of Quafalorma Red and White *var. Quafalorma*, one Evansville

Table 7

PREHISTORIC CERAMIC TYPES RECOVERED FROM SITE 16LF54, UNIT 4

	Level 2	Level 3	Total	Per cent
Baytown Plain *var. Percy Creek*	2		2	2.0
Baytown Plain *var. Addis*	10		10	10.1
Baytown Plain *var. unspecified*	7		7	7.1
Quafalorma Red and White *var. Quafalorma*	8		8	8.1
Coles Creek Incised *var. Coles Creek*	2		2	2.0
L'eau Noire Incised *var. Anna*	8		8	8.1
Unidentified Plain	30		30	30.3
Unidentified Incised	3	1	4	4.1
Unidentified Decorated	1		1	1.0
Eroded/Spalled Sherds	24		24	24.2
Daub	3		3	3.0
Total	**98**	**1**	**99**	**100.0**

Table 8

PREHISTORIC CERAMIC TYPES RECOVERED FROM SITE 16LF54, UNIT 5

	Level 1	Level 2	Total	Per cent
Baytown Plain *var. Percy Creek*	20	6	26	15.1
Baytown Plain *var. Addis*	22	8	30	17.4
Baytown Plain *var. unspecified*	5	13	18	10.5
Quafalorma Red and White *var. Quafalorma*	16	8	24	14.0
Larto Red *var. Larto*		2	2	1.2
Evansville Punctated *var. Braxton*		3	3	1.8
Evansville Punctated *var. Rhinehart*	1		1	0.6
Coles Creek Incised *var. Coles Creek*		3	3	1.8
Coleman Incised *var. Coleman*	1	1	2	1.2
Leland Incised *var. Leland*		1	1	0.6
Parkin Punctated *var. Hollandale*	2		2	1.2
Bell Plain *var. St. Catherine*	2		2	1.2
Mississippi Plain *var. Pocahontas*		1	1	0.6
Mississippi Plain *var. unspecified*	1		1	0.6
Pocahontas Punctated *var. Pocahontas*		1	1	0.6
Unidentified Plain	2	7	9	5.3
Unidentified Incised	3		3	1.8
Unidentified Slipped/Painted	1		1	0.6
Fired Clay/Clay Object	12	7	19	11.1
Eroded/Spalled Sherds	15	7	22	12.8
Total	**103**	**58**	**171**	**100.0**

Punctated *var. Rhinehart*, one Coleman Incised *var. Coleman*-like rim sherd, two Parkin Punctated *var. Hollandale* sherds, two sherds of Bell Plain *var. St. Catherine*, and one Mississippi Plain *var. unspecified* sherd were collected. Two unidentified plain sherds, three unidentified incised sherds, one unidentified slipped/painted sherd, 15 eroded/spalled sherds, and 12 pieces of fired clay (seven of which may be clay object fragments), also were recovered.

All but four of the 91 sherds collected from Level 1 were tempered with grog. The four remaining sherds included one grog/grit tempered unidentified plain sherd, one shell/sand tempered unidentified plain sherd, and two unidentified incised shell/sand tempered sherds. One of the shell/sand tempered incised sherds was very weathered and may have been brushed instead of incised.

Forty-four animal bones were collected from Level 1. These included nine deer bones (five of which were charred), six fish bones, one alligator tooth and one alligator phalanx bone, one bird bone, one small mammal bone, one large mammal claw, and 23 unidentified animal bone fragments. One antler bone awl also was recovered.

Sixty-one prehistoric ceramic sherds were collected from Level 2; these included six Baytown Plain *var. Percy Creek*, eight Baytown Plain *var. Addis*, 13 Baytown Plain *var. unspecified*, eight Quafalorma Red and White *var. Quafalorma*, two Larto Red *var. Larto* sherds, three Evansville Punctated *var. Braxton* sherds, three pieces of Coles Creek Incised *var. Coles Creek*, one Coleman Incised *var. Coleman*-like rim sherd, and one Leland Incised *var. Leland* sherd. One Baytown Plain *var. unspecified* sherd displayed "Six Mile" treatment, a punctated decoration that is present in Baytown period assemblages (Phillips 1970:223, 323, 332). One sherd each of Mississippi Plain *var. Pocahontas* and Pocahontas Punctated *var. Pocahontas* were collected, as were seven unidentified plain sherds, seven eroded/spalled sherds, and seven pieces of fired clay (three of which may be clay object fragments). One of the seven unidentified plain sherds may be a fragment of Bell Plain. All of the sherds from Level 2 were grog tempered, except for seven sherds. These seven included the three Evansville Punctated *var. Braxton* sherds, which were grog/sand tempered; two shell tempered sherds, Pocahontas Punctated *var. Pocahontas* and Mississippi Plain var. Pocahontas; one grog/grit tempered unidentified plain sherd; and the one possible Bell Plain sherd, which was tempered with grog and fine shell.

Forty-four animal bones were collected from Level 2. These included eight small mammal bones, four bird bones, three gar (*Lepisosteus* sp.) scales, three opossum vertebrae and one opossum jaw, two fish bones, two large mammal bones, two rodent teeth, one deer rib, two charred deer bones, one turtle shell, and 15 unidentified animal bone fragments.

Prehistoric ceramic sherds from Level 1 date from the Baytown (Quafalorma Red and White *var. Quafalorma;* and Coles Creek periods (Baytown Plain *var. Percy Creek*,

Evansville Punctated *var. Rhinehart*), to the Mississippian period (Baytown Plain *var. Addis*, Parkin Punctated *var. Hollandale*, and Bell Plain *var. St. Catherine* [terminal Mississippi]). Prehistoric ceramic sherds from Level 2 range from the late Marksville/early Baytown period (Evansville Punctated *var. Braxton*), to Baytown (Quafalorma Red and White *var. Quafalorma*, Larto Red *var. Larto*; "Six Mile" treatment), Coles Creek (Baytown Plain *var. Percy Creek*, Coles Creek Incised *var.* Coles Creek), Mississippian (Baytown Plain *var. Addis*, Coleman Incised *var. Coleman*, Leland Incised *var. Leland*, Pocahontas Punctated *var. Pocahontas,* Mississippi Plain *var. Pocahontas* [terminal Mississippian]), and Contact periods (Pocahontas Punctated *var. Pocahontas*, Mississippi Plain *var. Pocahontas*).

The presence of sherds dating from the Marksville period through historic contact indicates long term use of the site area. Additionally, the presence of ceramic types possibly originating outside of the state suggests that the area attracted trade with nonlocal peoples.

Unit 6

One hundred and nineteen prehistoric ceramic sherds and five fired clay/clay object fragments (Table 9), 31 animal bone fragments, and one quartz crystal were collected from two levels in Unit 6. Level 1 contained 59 prehistoric ceramic sherds, one fired clay/clay object fragment, and five animal bone fragments. Sixty-four prehistoric ceramic sherds and 26 bone fragments were collected from Level 2.

Ceramic sherds recovered from Level 1 included 10 Baytown Plain *var. Addis sherds*, nine sherds of Baytown Plain *var. Percy Creek*, and five Baytown Plain *var. unspecified* sherds. Five Quafalorma *var. Quafalorma* sherds, one Evansville Punctated *var. Rhinehart* sherd, one Coles Creek Incised *var. Blakely* sherd, one Leland Incised *var. unspecified* sherd, and one Coleman Incised *var. Coleman*-like sherd were collected. The Coleman Incised var. Coleman-like rim sherd cross-mended with the Coleman Incised *var. Coleman*-like rim sherd recovered from Level 2, Unit 5. Five unidentified plain sherds, one unidentified incised sherd, 20 eroded/spalled sherds, and one piece of fired clay/clay object fragment were recovered. All but four of the sherds were grog tempered. The Leland Incised *var. unspecified* sherd and an unidentified plain sherd were shell/sand tempered while two unidentified plain sherds were sand tempered. Two cross-mending deer antler fragments, one alligator bone, one fish bone, and one small mammal fibula also were collected from Level 1.

Ceramic sherds recovered from Level 2 included nine Baytown Plain *var. Percy Creek*, 17 Baytown Plain *var. Addis*, and seven Baytown Plain *var. unspecified* sherds. Nine Quafalorma Red and White *var. Quafalorma* sherds, one Larto Red *var. Larto* sherd, one Leland Incised *var. unspecified sherd*, and four pieces of Bell Plain *var. St. Catherine* also were collected. One unidentified brushed sherd, one unidentified incised sherd, 10 eroded/spalled sherds, and four pieces of fired clay/clay object fragments were

Table 9

PREHISTORIC CERAMIC TYPES RECOVERED FROM SITE 16LF54, UNIT 6

	Level 1	Level 2	Total	Per cent
Baytown Plain *var. Percy Creek*	9	9	18	14.5
Baytown Plain *var. Addis*	10	17	27	21.8
Baytown Plain *var. unspecified*	5	7	12	9.7
Quafalorma Red and White *var. Quafalorma*	5	9	14	11.3
Larto Red *var. Larto*		1	1	0.8
Evansville Punctated *var. Rhinehart*	1		1	0.8
Coles Creek Incised *var. Blakely*	1		1	0.8
Leland Incised *var. unspecified*	1	1	2	1.6
Coleman Incised *var. Coleman*	1		1	0.8
Bell Plain *var. St. Catherine*		4	4	3.2
Unidentified Plain	5		5	4.0
Unidentified Brushed		1	1	0.8
Unidentified Incised	1	1	2	1.6
Fired Clay/Clay Object	1	4	5	4.0
Eroded/Spalled Sherds	20	10	30	24.2
Total	**60**	**64**	**124**	**99.9**

recovered, as well. All of the Level 2 sherds were grog tempered. Bone fragments recovered from Level 2 included 11 pieces of deer antler, of which 10 cross-mended (Figure 20). Two deer bones, one of which is a navicula-cuboid bone, eight bird bones, one fish bone, and four unidentified bone fragments also were recovered.

Level 1 contained prehistoric ceramic types dating from the Baytown (Quafalorma Red and White *var. Quafalorma*), Coles Creek (Evansville Punctated *var. Rhinehart*, Coles Creek Incised *var. Blakely*, Baytown Plain *var. Percy Creek*), and Mississippian periods (Baytown Plain *var. Addis*, Coleman Incised *var. Coleman*, Leland Incised *var. unspecified*). Level 2 ceramic types also date from Baytown to Mississippian times; one of these, Bell Plain *var. St. Catherine*, dates from the terminal Mississippian period.

Unit 7

Unit 7 produced 34 prehistoric ceramic sherds, three fired clay object fragments (Table 10), and 18 animal bone fragments from two levels. Level 1 contained 18 prehistoric ceramic sherds, three fired clay/clay object fragments, and seven animal bones; Level 2 produced 16 prehistoric ceramic sherds and 11 animal bones.

Ceramic sherds recovered from Level 1 included six Baytown Plain *var. Percy Creek* sherds, two Baytown Plain *var. Addis* sherds, one Baytown Plain *var. unspecified* sherd, five Quafalorma Red and White *var. Quafalorma* sherds, one Larto Red *var. Larto* sherd, and one Mississippi Plain *var. Pocahontas* sherd. Three pieces of fired clay/clay object fragments and two eroded/spalled sherds also were collected. All but one sherd, the shell tempered Mississippi Plain *var. Pocahontas*, were grog tempered. In addition, seven bone fragments including two bird bones, one muskrat jaw with teeth, one opossum jaw, and three unidentified animal bones were collected from Level 1.

Sixteen prehistoric ceramic sherds were collected from Level 2, including two Baytown Plain *var. Percy Creek,* four Baytown Plain *var. unspecified,* two Quafalorma Red *var. Quafalorma,* one Maddox Engraved *var. unspecified,* and one Mississippi Plain *var. Pocahontas*. Four pieces of unidentified plain and two eroded/spalled sherds also were recovered. All ceramic sherds from Level 2 were grog tempered except one Mississippi Plain *var. Pocahontas* sherd, which was shell tempered. Animal bone fragments from this level included six possible bird bones, two deer bones, one small mammal bone, and two unidentified, (one of them charred) animal bones.

Level 1 ceramic sherd types date from Baytown (Quafalorma Red and White *var. Quafalorma,* Larto Red *var. Larto*), Coles Creek (Baytown Plain *var. Percy Creek*), Mississippi (Baytown Plain *var. Addis*) and terminal Mississippi times (Mississippi Plain *var. Pocahontas*). Level 2 ceramic types exhibit the same date range as that found in Level 1.

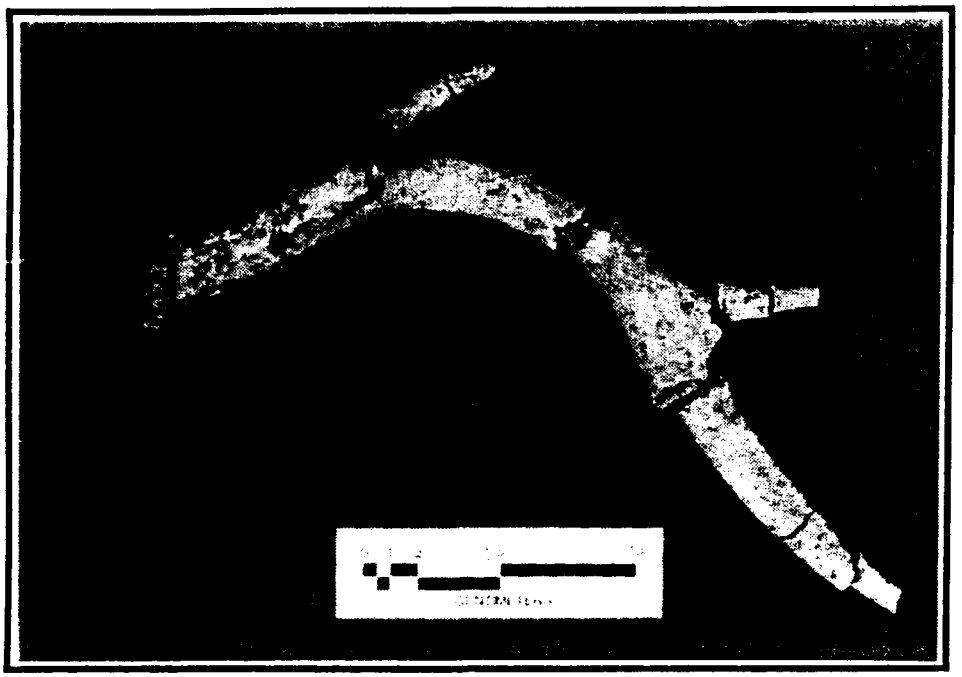


Figure 20. Fragmented deer antler from 16LF54, Unit 6, Level 2

Table 10

PREHISTORIC CERAMIC SHERD TYPES RECOVERED FROM SITE 16LF54, UNIT 7

	Level 1	Level 2	Total	Per cent
Baytown Plain *var. Percy Creek*	6	2	8	21.6
Baytown Plain *var. Addis*	2		2	5.4
Baytown Plain *var. unspecified*	1	4	5	13.5
Quafalorma Red and White *var. Quafalorma*	5	2	7	19.0
Larto Red *var. Larto*	1		1	2.7
Maddox Engraved *var. unspecified*		1	1	2.7
Mississippi Plain *var. Pocahontas*	1	1	2	5.4
Unidentified Plain		4	4	10.8
Fired Clay/Clay Object	3		3	8.1
Eroded/Spalled Sherds	2	2	4	10.8
Total	**21**	**16**	**37**	**100.0**

Unit 8

Twenty-five prehistoric ceramic artifacts and two fired clay/clay object fragments (Table 11), and 26 animal bones were collected from two levels in this unit. Level 1 contained 18 ceramic artifacts and eight animal bones. Level 2 included nine ceramic artifacts and 18 animal bones.

Ceramic sherd types recovered from Level 1 include two Baytown Plain *var. Percy Creek* sherds, one Baytown Plain *var. Little River* sherd, five Baytown Plain *var. unspecified* sherds, one piece of Churupa Punctated *var. Churupa*, five sherds of Quafalorma Red and White *var. Quafalorma*, one fragment of Mississippi Plain *var. Pocahontas*, and one sherd of Bell Plain *var. St. Catherine*. Two untempered fired clay/clay object fragments also were collected. The Mississippi Plain *var. Pocahontas* sherd was shell tempered. The remainder of the ceramic sherds recovered from Level 1 were grog tempered. The Churupa Punctated *var. Churupa* sherd did not contain the blue-green apatite inclusions found on the Unit 2 specimen. Animal bones recovered from Level 1 include four deer bones, one gar fish scale, one possible gar fish bone, one bird bone, and one small mammal bone.

Nine prehistoric ceramic sherds were collected from Level 2, including one sherd of Baytown Plain *var. Percy Creek*, two Baytown Plain *var. unspecified sherds*, two Coles Creek Incised *var. Coles Creek* sherds, one sherd of Winterville Incised *var. unspecified*, one unidentified incised sherd, and two eroded/spalled sherds. Level 2 sherds were grog tempered except Winterville Incised, which was shell/sand tempered. In addition, Level 2 produced 18 animal bones including four deer bones, three small mammal bones, two bird bones, one muskrat jaw with teeth, and eight unidentified animal bones.

Level 1 ceramic sherd types date from the Marksville (Churupa Punctated *var. Churupa*), Troyville/Coles Creek (Baytown Plain *var. Little River*), Mississippian (Winterville Incised *var. unspecified*) terminal Mississippian (Bell Plain *var. St. Catherine*, Mississippian Plain *var. Pocahontas*, Winterville Incised *var. unspecified*), and Contact periods (Mississippian Plain *var. Pocahontas*). Level 2 ceramic sherds range from Coles Creek times (Baytown Plain *var. Percy Creek,* Coles Creek Incised *var. Coles Creek*) to the terminal Mississippian period (Winterville Incised *var. unspecified*). In general, however, Unit 8 ceramic sherds date from the Baytown period to Historic Contact; only one sherd possibly was manufactured during the Marksville period.

Summary

Ceramic sherds recovered from 16LF54 span the Baytown through Historic Contact periods; a few sherds may date from Marksville times. This range of ceramic types indicates that the site was utilized for centuries. The presence of daub, found during shovel testing as well as in Units 1 and 4, indicates that the site contained structures. In

Table 11

PREHISTORIC CERAMIC TYPES RECOVERED FROM SITE 16LF54, UNIT 8

	Level 1	Level 2	Total	Per cent
Baytown Plain *var. Percy Creek*	2	1	3	11.1
Baytown Plain *var. Little River*	1		1	3.7
Baytown Plain *var. unspecified*	5	2	7	26.0
Churupa Punctated *var. Churupa*	1		1	3.7
Quafalorma Red and White *var. Quafalorma*	5		5	18.5
Coles Creek Incised *var. Coles Creek*		2	2	7.4
Winterville Incised *var. unspecified*		1	1	3.7
Mississippi Plain *var. Pocahontas*	1		1	3.7
Bell Plain *var. St. Catherine*	1		1	3.7
Unidentified Incised		1	1	3.7
Fired Clay/Clay Object	2		2	7.4
Eroded/Spalled Sherds		2	2	7.4
Total	**18**	**9**	**27**	**100.0**

addition, a few apparently exotic ceramic specimens were recovered, suggesting influence by prehistoric people from the eastern Gulf Coast.

Isolated Finds

Two ceramic sherds of Baytown Plain *var. Addis*, were recovered outside the site area. One sherd was recovered in canal spoil during surface collection of Segment 1A (Figure 1). The second sherd was collected in Segment 4B (Figure 1), along Transect 2. Samples of *Rangia cuneata* shells also were collected in Segment 1A, including one 70.8 g sample from Transect 1, and one 4.9 g sample from Transect 3.

Burial 1

Burial 1 (Figures 12 and 15) contained the remains of one adult human skeleton. The burial was analyzed by R. Christopher Goodwin, William P. Athens, and Jennifer A. Cohen. The remains were very fragmented, and possibly belonged to a female individual, roughly between the ages of 35 and 45. Bones were divided into long, short, flat, and irregular categories, then into cranial and post cranial categories; further identification was made when possible. However, several bone fragments could not be identified, and were weighed and placed in an unidentified human bone category.

All of the long bones were in a fragmentary state; measurements were taken of long bone fragments that could be crossmended, but the lack of epiphyses or of crossmending shafts precluded stature calculations. Likewise, the extremely fragmented state of the innominate bones as well as the cranium limited the positive identification of sex and age. The general gracile appearance of the skeleton suggests a female individual. The wear pattern on the teeth as well as several bone fragments that displayed fused epiphyses centers were used to age the skeleton. Because of the deteriorated condition of the skeletal remains, little additional data about the individual could be learned.

Cranial Bones

Cranial bones included one from the base of the cranium, two petrous portions of the temporal including the external auditory meatus, two malar bone fragments, and one occipital bone with a gracile external occipital protuberance. Also recovered was one right maxillary fragment, with four teeth intact: one second incisor, one canine, and two bicuspids. The crowns on all four teeth were heavily worn. One single molar, possibly the upper third molar, also was observed.

Mandibular bone fragments included three cross-mending pieces. One mandibular fragment, possibly originating from the left sigmoid notch area also was observed. The

right mandible contained no intact teeth, and while part of sigmoid notch remained, both the condyle and coronoid process were missing. The left mandibular side was missing both the coronoid and condyle, as well as the angle of the mandible and the ramus. The left mandibular fragment, however, contained four intact teeth: three molars and the second premolar. The crowns of the second premolar, and of the first and second molars, were worn off, and the third molar displayed wear on its crown. This pattern of molar wear correlates with the 35 to 45 age group (Brothwell 1981:72). Two loose teeth also were recorded, one right third molar and one lower left first premolar. The third molar showed some wear; the crown was intact, while the premolar was heavily worn. One hundred and five unidentified cranial bone fragments, and 61 unidentified flat bone fragments (12.5g), many of them probably from the cranium also were collected.

Postcranial Bones, Upper Extremities

Right arm bone fragments included two crossmending right humerus fragments, exhibiting a healed fracture. This fragment measured 23.1 cm. Two possible right humerus epiphyseal fragments and one possible humerus long bone fragment also were observed. Lower right arm bone fragments included three crossmending radius fragments, measuring 18.7 cm, three crossmending ulnar fragments measuring 26.1 cm, 15 long bone fragments, and five fragments of epiphyses. The right radius had a partially intact epiphysis, while the right ulna displayed part of the olecranon.

Left arm bones included two crossmending left humerus fragments, one with the radial head and trochlea still present. The crossmended left humerus measured 18.6 cm. Lower left arm bones included three crossmended radius fragments, measuring approximately 19.4 cm. The radial tuberosity and part of the head remained, but all of the lower extremity was missing. Two crossmending ulnar fragments measuring approximately 23.0 cm also were noted. Most of the upper ulnar extremity was missing, and all of the lower epiphysis was gone. Fourteen other lower left arm fragments were found.

Right hand and wrist bones included 26 metacarpal and phalange bone fragments, at least eight pieces of carpal bones, and 32 short and irregular bone fragments. Left hand and wrist fragments included 28 metacarpal and phalange bone fragments and a minimum of three carpal bone fragments. Miscellaneous right and left hand and wrist bone fragments included one right metacarpal/phalange bone fragment, one carpal bone, possibly the lunata, and three metacarpal bones.

Bone fragments of the vertebral column included 31 unidentified cervical and thoracic vertebrae fragments, and 41 thoracic and lumbar vertebrae fragments. Ten other lumbar vertebrae fragments also were observed, as were 41 smaller vertebrae and rib fragments, including crushed vertebral bone (12.6 g).

Rib fragments from the left side included 85 smaller rib bone fragments and 16 longer rib bone pieces. Right side rib bones included 71 rib bone fragments. Miscellaneous rib fragments included 43 rib bone fragments, one possible first rib fragment, and 22 pieces of unidentified flat bone (1.5 g), probably rib fragments. One partial left clavicle fragment was recorded, and measured approximately 8.1 cm. Both ends were missing. Three fragments of scapular bone also were noted.

Postcranial Bones, Lower Extremities

Eighty-six left innominate bone fragments and three larger innominate bone fragments were observed, as were five right innominate bone fragments and 157 mostly flat innominate bone fragments. Also recorded was 5.3 g of crushed innominate bone fragments.

Upper right leg bones included one right patella, four crossmending femur fragments, measuring 33 cm, one almost complete femur head, 15 long bone fragments, and 14 epiphyses fragments. Upper left leg bones included one left patella, two crossmending femur fragments measuring approximately 23.0 cm, one femur head fragment, 40 long bone fragments, and 12 epiphyseal fragments.

Lower right leg bones included three tibiae fragments, one larger piece measured 19.5 cm; the epiphyses were missing. Four crossmending right fibulae fragments measuring 28.3 cm also were noted. Forty-six tibia and fibula fragments were recorded.

Lower left leg bones included two crossmending tibia fragments measuring approximately 23.0 cm, two smaller crossmending tibia fragments, two tibia (noncrossmending) long bone fragments, and four crossmending fibula fragments. Forty-eight tibia and fibula fragments were noted.

Left foot bones included 15 short bone fragments, most likely metatarsal and phalange parts, six irregular bones, most likely tarsal bones, and 24 short bone fragments. Right foot bones included 10 short bone fragments, nine irregular bone fragments, seven metatarsal and phalange bone fragments, and 11 short bone fragments.

Eleven prehistoric ceramic sherds were recovered from the vicinity of Burial 1, but are not considered to be grave goods. The sherds included three Baytown Plain *var. Percy Creek*, one Baytown Plain *var. Baytown,* five Quafalorma Red and White *var. Quafalorma*, one Bell Plain *var. St. Catherine*, and one eroded/spalled sherd. These sherds range in origin from the Baytown period to the Coles Creek and Mississippian periods.

CHAPTER IX

SUMMARY AND RECOMMENDATIONS

Summary

Archeological survey of Section D of the Larose to Golden Meadow Hurricane Protection Project located one archeological site, and one modern refuse locus. Bayou L'Ours Mounds (16LF54) is a two-mound village site situated adjacent to the bayou. The locus of modern refuse is a small modern camp; the cabin was burned in 1989. Because it is less than 50-years-old, and since it lacks substantive research potential, it does not possess the quality of significance as defined by National Register of Historic Places criteria. No additional testing is recommended at the camp.

Bayou L'Ours Mounds (16LF54) is comprised of two prehistoric mounds surrounded by a habitation area. Situated on the west bank natural levee of West Fork Bayou L'Ours, it is located at the junction of the bayou and a crevasse splay. This splay, with the wide variety of natural resources it afforded, probably was an integral reason for settlement at this location. During testing, 37 shovel tests, eight auger tests, and eight excavation units were placed across the site. Testing resulted in delineation of site boundaries in and near the project corridor. The site forms an irregular oval that encompasses approximately 1.8 acres.

Site testing also defined the vertical extent of the site. The very dark gray and dark gray cultural deposits generally are 20 to 30 cm thick, overlying a culturally sterile gray clay. Distribution of *Rangia cuneata* from unit to unit varied considerably. For example, Unit 1 contained very few shell fragments, while Unit 5, located less than 10 m to the west, had enough shell to define a distinct shell lens. Since the site possesses overall archeological integrity, study of shell distribution patterns within the site may provide important information about settlement and refuse disposal patterns.

Numerous ceramic types were recovered from the site. These included Quafalorma Red and White *var. Quafalorma*; Coles Creek Incised *var. Coles Creek*; Evansville Punctated *var. Evansville* and *Braxton*; Churupa Punctated *var. Churupa*; L'eau Noire *var. L'eau Noire* and *Anna*; Coleman Incised *var. Coleman*; Bell Plain *var. St. Catherine*; Leland Incised *var. Leland*; French Fork Incised *var. French Fork*; Barton Incised *var. Estille*; and, Parkin Punctate *var. Hollandale*. The temporal affiliation of these types indicate that the Bayou L'Ours Mounds (16LF54) probably was occupied during the Troyville through Mississippian periods, and that it may contain a late Marksville component.

Recovered faunal remains included deer, alligator, muskrat, opossum, turtle, gar, turkey or goose, and fish and avian species. This site can provide information about

dietary habits of the inhabitants of the site, and may provide a basis for comparison with other contemporaneous, similarly located mound and village sites throughout the Lafourche delta lobe (e.g. Table 2).

One burial was located during site testing. This burial comprised the poorly preserved remains of an adult female who was buried face-down and west of Mound B. Based on the skeleton's stratigraphic position underlying an undisturbed shell lens, burial probably occurred during the early occupation of the site. The probability for encountering additional burials at the site is high; these could provide important data regarding demography, dental health, dietary habits, morbidity, and burial practices in the region.

Vertical archeological deposits at Bayou L'Ours Mounds exhibited some evidence of mixing, with some relatively late ceramic sherds recovered from lower cultural deposits. However, some *in situ* shell lenses also were observed, including one which capped much of Burial I. Based on collected data, while at least moderate vertical mixing of cultural deposits has occurred, *in situ* cultural strata probably are present. Additional excavations at the site would provide the quantity of data necessary to define better the site's vertical integrity.

While up to 20 per cent of the site was destroyed by excavation of the inlet and several small borrow pits, the rest of the site possesses good archeological context. Mound A is damaged by an old pot hole, but most of the mound is still intact. Mound B is in good condition except for disturbances caused by a large live oak tree which occupies its top. Deposits appear to be intact. Localized concentrations of *Rangia cuneata* shell occur within the site, which may provide data on subsistence patterns and on the organization of village space. The site contains a large quantity of prehistoric pottery and faunal remains, and possibly more burials. While many prehistoric sites, including mounds and village sites, have been identified in the region, substantive archeological excavations have occurred at very few of these sites. The Bayou L'Ours Mounds site (16LF54) has the potential to provide important information about prehistoric development in the south Louisiana coastal region.

The Bayou L'Ours Mounds (16LF54) are situated within Management Unit V, as defined by *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983). Six, and possibly seven, of the 25 cultural themes identified for the unit relate to the site. These include: Troyville-Coles Creek Culture; Plaquemine Culture; Mississippian Cultural Influence; Prehistoric Adaptation to the Alluvial Valley; Prehistoric Adaptation to the Changing Deltas; Prehistoric Coastal Subsistence and Settlement Patterns; and possibly Prehistoric Agriculture -- Its Form, Extent and Importance (Smith et al. 1983:95). Further testing at Bayou L'Ours Mounds could address a number of research goals identified in the state plan. Among others, these include the following combined goals: (1) to define the range of dates and phases for the Troyville-Coles Creek, Plaquemine, and Mississippian cultures; (2) to define the range of the artifact assemblage associated with

the Troyville-Coles Creek, Plaquemine, and Mississippian cultures; (3) to define the subsistence system for the Troyville-Coles Creek, Plaquemine, and Mississippian cultures; to define the settlement system for the Troyville-Coles Creek, Plaquemine, and Mississippian cultures; (5) to examine the rise of religion and ceremonialism during the Troyville-Coles Creek period, and to examine its role during the Plaquemine and Mississippian cultures; (6) to examine the relationship of Troyville-Coles Creek, Plaquemine, and Mississippian cultures to surrounding contemporaneous cultures, including possible Meso-American influences; (7) to obtain adequate samples of physical remains to identify medical practices and mortality profiles of Troyville-Coles Creek, Plaquemine, and Mississippian peoples; and, (8) to examine the relationship between Plaquemine and Mississippian cultures (Smith et al. 1983). Thus, additional excavations at Bayou L'Ours Mounds (16LF54) could provide important data for up to seven significant regional themes. In addition, a number of research goals established by the Louisiana Division of Archaeology could be addressed.

Archeological testing at Bayou L'Ours Mounds (16LF54) has confirmed that the site possesses good archeological integrity, and considerable research potential. Data important for understanding a variety of significant regional themes could be obtained through further archeological testing at the site. Therefore, the site possesses the quality of significance, as defined by the National Register criteria [36 CFR 60.4(d)].

Recommendations

The single archeological site identified during archeological testing, Bayou L'Ours Mounds (16LF54), is a significant cultural resource. The proposed levee alignment, as originally designed, would directly impact the site through a combination of levee construction and heavy machinery movement. It is recommended that the proposed levee be moved westward to avoid the site completely. In addition, the site boundaries should be marked clearly, and all mechanized equipment should avoid the site completely. Finally, pedestrian utilization of the site during levee construction should be minimized to prevent further erosion or looting of the site. If the site can be avoided by levee construction activities, no additional testing is recommended. If the site cannot be avoided during planned levee construction, a research design should be developed to mitigate impact to the site.

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APPENDIX I

SCOPE OF SERVICES

CELMN-PD-RA 17 October 1989

Contract DACW29-88-D-0121
Delivery Order 8

SCOPE OF SERVICES

CULTURAL RESOURCES INVESTIGATIONS OF LAROSE TO GOLDEN MEADOW HURRICANE PROTECTION PROJECT LEVEE SECTION D, LAFOURCHE PARISH, LOUISIANA

1. Introduction

The U.S. Army Corps of Engineers, New Orleans District (NOD), is constructing the Larose to Golden Meadow Hurricane Protection Project in Lafourche Parish, Louisiana. All parts of the project except for Levee Section D (see map) have been previously surveyed for the presence of cultural resources (Goodwin et al 1986).

This delivery order calls for an intensive cultural resources survey of the alignment of Levee Section D. The contract period for this work is 235 days.

2. Study Area

The project is located in southeastern Louisiana within Lafourche Parish. The project involves completing hurricane protection levees ringing properties lying along Bayou Lafourche in the area including the communities of Larose and Golden Meadow. Levee section D runs approximately 3.5 miles along the edge of the crest of the natural levee of Bayou l'Ours. About 80 acres of borrow area will also be needed. The area to be surveyed (levee and borrow areas total) consists of approximately 200 acres of land.

3. Background Information

Comprehensive background studies and research design creation have already been done for the area as part of the Archeological and Historical reports prepared for the other segments of the project (see Goodwin et al 1986). This existing material obviates the need for independent background and literature search under this delivery order. This existing material provides adequate research and background context and source material for the introductory parts of the final report to be prepared for this delivery order.

Levee section D does not fall within areas previously subjected to formal archeological survey. Two archeological sites are located in or near the levee alignment. One site (the Bayou L'Ours Mound, 16LF54) is a Troyville-Coles Creek earthen mound defined as a result of studies done for the Louisiana Offshore Oil Port. The other site has not been formally documented. No standing structures appear on aerial photographs of the area. No properties currently listed in or determined eligible for inclusion in the NRHP are recorded in the project area.

The levee alignment runs the length of the natural levee of a well developed distributary channel. The presence of additional archeological sites in this landform context is highly probable. The known sites need to be formally evaluated to determine their exact relationship to the project impact area. Bayous L'Ours and Raphael are suggested to be streams which prograded across an eroded and subsiding system of Bayou Blue lobe interdistributary lakes and bays. The natural levees of these streams are thus late Bayou Lafourche lobe deposits and archeological sites located on them should not be more than 500 to 600 years old.

4. General Nature of the Work to be Performed.

One area of study which contains approximately 200 acres within Lafourche Parish, Louisiana, will be addressed under this delivery order. The investigation will utilize SELACRMP, and the reports on contiguous parts of the project for general background, overview and research perspectives. The work will be divided into three phases :

(1) Mobilization and Title Search
(2) Intensive Cultural Resources Survey and Site Assessment
(3) Data Analysis and Report Preparation

5. Study Requirements

Phase 1: Mobilization and Title Search

A title search will be done for the study area. The title search will provide a history of land ownership as context for the evaluation of archeological sites which may be found by the survey. A review of pertinent geomorphological sources will be done to refine the survey methodology. No extensive literature review or historic map research will be performed under this delivery order. The need for extensive background work is obviated by the comprehensive nature of previous Larose to Golden Meadow Project and SELACRMP studies.

Phase 2: Intensive Cultural Resources Survey and Site Assessment

Upon completion of Phase 1, the contractor will conduct an intensive pedestrian survey augmented with systematic subsurface testing. No excavation will be permitted within any existing levee. It is suggested that the Contractor utilize a 20-meter transect width and a shovel-testing interval of 50 meters in an offset pattern. This testing regime should be conducted to the greatest extent possible depending on the density of tree cover. Shovel tests will be approximately 30x30 cm in the horizontal plane down to sterile subsoil. All excavated soil will be screened through 1/4 inch wire mesh. All shovel tests will be backfilled. This systematic procedure will be supplemented with judgmental shovel testing based upon the background research.

State site forms will be completed and state-assigned site numbers will be utilized for all archeological sites located by the survey. All sites located in the survey area will be mapped, photographed, and tested using shovel, auger, and limited controlled surface collection to determine depth of deposit, site boundaries, stratigraphy, cultural association, and possible activity areas. All cultural resources located by the survey will be evaluated against the National Register criteria contained in Title 36 CFR Part 60.4 and within the framework of the historic setting to assess the potential eligibility for inclusion in the National Register.

Further test excavations to determine site significance within the context of the Contractor's technical proposal will be conducted at a maximum of two sites which the Contractor, in consultation with and approval by the COR, deem possibly eligible for inclusion in the National Register. Should the survey locate more than two sites which require further testing to determine eligibility, such testing is beyond the scope of this delivery order. Test excavations will include excavation of two or more 1m x 2m test units per site as necessary. A backhoe may be utilized if needed. All test excavations will be backfilled. All profiles and features excavated will be mapped and photographed. Any pre-World War II standing structures located in the right-of-way will be recorded using state standing structure forms and a minimum of three clear black and white photographs. All such structures will be professionally evaluated to determine historical association and National Register eligibility. For structures located in the project right-of-way, the Contractor shall also address the archeological component of the site. No structures are anticipated.

A full assessment of the extent of previous adverse impacts to the unknown cultural resource base where levee construction has been completed should be attempted through field investigations.

Upon completion of the Phase 2 field work, a management summary succinctly reporting the results of the background research and the field survey shall be submitted to the COR within 14 days (see section 6).

Phase 3: Data Analysis and Report Preparation

All data will be analyzed using currently acceptable scientific methodology. The Contractor shall catalogue all artifacts, samples, specimens, photographs, drawings, etc., utilizing the format currently employed by the Louisiana State Archeologist. The catalogue system will include site and provenience designations.

The Contractor shall abstract from SELACRMP and previous project cultural resource studies brief descriptions of the geomorphology, ecology, and cultural history of the area, and summarize previous research. This information shall be integrated with the title search and survey results, and analyses to produce an appropriately illustrated, scientifically acceptable draft report.

All cultural resources located by the survey within the study area will be evaluated against the NRHP criteria contained in Title 36 CFR Part 60.4 and within the framework of the historic setting to assess the potential eligibility for inclusion in the NRHP. The Contractor will classify each site as being *eligible*, *potentially eligible*, or *not eligible* for inclusion in the NRHP.

6. Reports

Management Summary

Four copies of the management summary, one set of U.S.G.S. quadrangle maps accurately delineating site locations, and one set of site forms for any sites located will be submitted to the COR within 14 days after completion of field work (98 days after date of order). The management summary will succinctly report the results of the field investigations, i.e. number, type, brief description and assessment of project impacts for all cultural resources located and preliminary assessments of site significance. If cultural resources are identified during the survey, the report will recommend which (if any) of them should be avoided in the lay out of the levee alignment. The summary report is not intended to be a lengthy interim report, but shall contain enough information to serve as a planning aid and a means of informing the COR .

Monthly Progress Reports

Throughout the duration of the delivery order, one copy of a brief and concise statement of progress shall be submitted with and for the same period as the monthly billing voucher. These reports, which may be in letter form, should summarize all work performed, all information gained, or any problems encountered during the preceding month. A concise statement and graphic presentation of the Contractor's assessment of the monthly and cumulative percentage of total work completed by task shall be included. The monthly report should also note difficulties, if any, in meeting the contract schedule.

Draft and Final Reports

Five copies of the draft report integrating all phases of this investigation will be submitted to the COR for review and comment 137 days after date of date of order. The Contractor shall submit state site forms for sites discovered in the course of work under this delivery order as an appendix to the draft report.

The written report shall follow the format set forth in MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with 1-inch margins; (3) the reference format of American Antiquity will be used. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual dated January 1973. A copy of the Delivery Order Scope-of-Services shall be bound with the Final Report.

The COR will provide all review comments to the Contractor within 42 days after receipt of the draft reports (179 days after date of order). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report to the COR within 21 days (200 days after date of order). Upon approval of the preliminary final report by the COR, the Contractor will submit 30 copies and one reproducible master copy of the final report to the COR within 235 days after date of order. Included as an appendix to the Final Report will be a complete and accurate listing of cultural material and associated documentation recovered and/or generated. The contractor will also deliver one copy of the report on IBM-compatible disks in either Microsoft Word™ or ASCII format.

In order to preclude vandalism, the final report shall not contain specific locations of archeological sites. Site specific information, including one set of project maps accurately delineating site locations, site forms, black and white photographs and maps, shall be included in an appendix separate from the main report.

7. References

The study will be conducted utilizing current professional standards and guidelines including, but not limited to:

-The National Park Service's draft standards entitled, "How to Apply the National Register Criteria for Evaluation," dated June 1, 1982;

-The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation as published in the Federal Register on September 29, 1983;

-Louisiana's Comprehensive Archeological Plan dated October 1, 1983;

-The Advisory Council on Historic Preservation's regulation 36 CFR Part 800 entitled, "Protection of Historic Properties."

-The Advisory Council on Historic Preservation's Section 106, Update/3 entitled, "Manual of Mitigation Measures (MOMM)" dated October 12, 1982.

-Agency for Conservation Archeology, Eastern New Mexico University Southeast Louisiana Cultural Resource Management Plan (SELACRMP).

-R. Christopher Goodwin and Associates, Inc., Cultural Resources Survey of the Western Sections of the Larose to Golden Meadow Hurricane Protection Project, Lafourche Parish, Louisiana, dated September 18, 1986.

8. Attachments

Location of Work Area (previously furnished)

9. Disposal of Records and Artifacts

All records, photographs, artifacts, and other material data recovered under the terms of this delivery order shall be recorded and catalogued in a manner compatible with those systems utilized by the Louisiana SHPO and by State and Federal agencies which store archeological data. They shall be held and maintained by the Contractor until completion of the delivery order. Final disposition of the artifacts and records will be in accordance with applicable Federal and State laws. Unless otherwise specified, artifacts will be returned to the landowner or permanently housed with the Louisiana Division of Archaeology and Historic Preservation or in a repository selected by the State Archeologist. The Principal Investigator shall inform the COR in writing when the transfer of data has been completed and shall forward to the COR a catalogue of items entered into curation. The location of any notes, photographs or artifacts which are separated from the main collections from the project area which are used in data analyses will remain in private ownership. The Contractor shall be responsible for delivery of the analyzed archeological material to the individual landowners, the Louisiana SHPO's office, or any other repository designated by the Government following acceptance of the final report. All artifacts to be permanently curated will be cleaned, stabilized, labeled, catalogued on typed State curation forms, and placed in sturdy bags and boxes which are labeled with site, excavation unit or survey collection unit provenience.

10. Schedule

Initiate Phase 1 (Mobilization & Title Search)-14 days after date of order

Initiate Phase 2 (Field Survey & Site Assessment)-42 days after date of order

Submit Management Summary- 98 days after date of order

Submit Draft Report-137 days after date of order

Receive NOD comments-179 days after date of order

Provide Preliminary Copy of Final Report-200 days after date of order

Submit Final Reports-235 days after date of order

APPENDIX II

STRATIGRAPHIC PROFILES OF BACKHOE TRENCHES AND AUGER TESTS AT 16LF54

DESCRIPTION OF BACKHOE TRENCHES

Backhoe Trenches 1 and 2

Layer 1 Dark grayish brown (10YR 4/2) abundant, large to fine, dark yellowish brown (10YR 4/4) mottles; silt loam (some very fine sand present); massive and structureless; non-sticky; noncalcareous; scattered large roots with yellowish brown (10YR 5/8) sediments around them.

Layer 2 Brown (10YR 4/3) grading downward to dark grayish brown (10YR4/2); silty clay loam; fine, moderate, subangular blocky structure; slightly sticky to non-sticky; noncalcareous; scattered large roots; gradual and irregular lower boundary.

Layer 3 Black, (10YR 2/1); silt loam; medium, moderate, crumb structure; non-sticky; noncalcareous; abundant fine roots in upper 10cm; clear and wavy (to irregular) lower boundary.

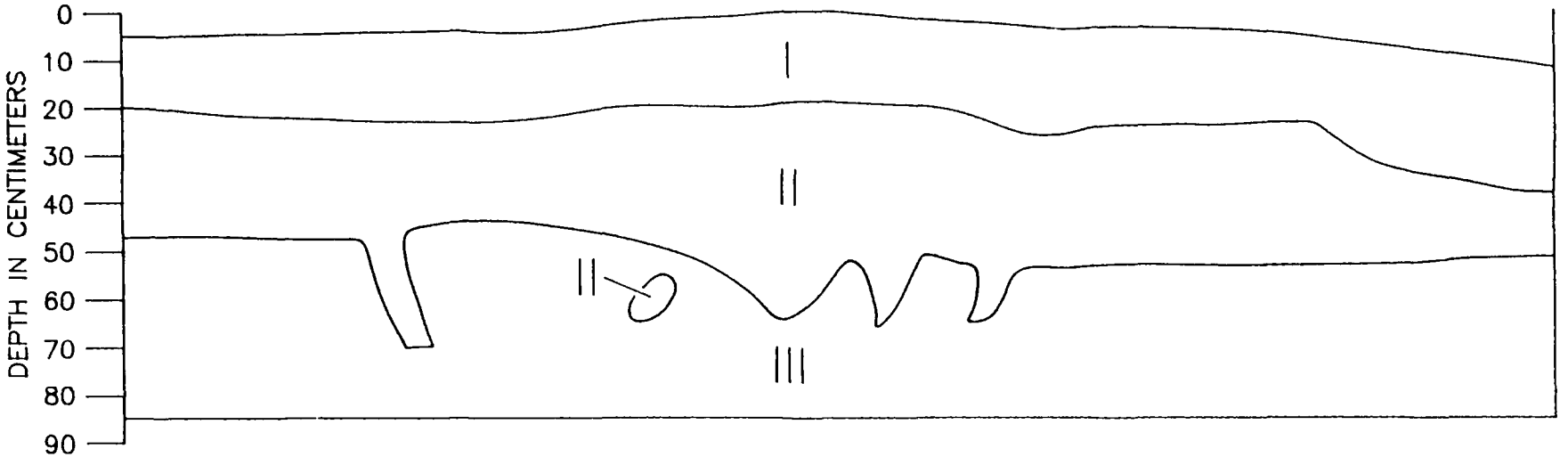
Backhoe Trench 3

Layer 4 Gray (10YR 5/1) with many, fine to large dark yellowish brown (10YR 4/4 to 4/6) mottles; silty clay loam grading downward into silt loam; massive; non-sticky; noncalcareous.

Layer 5 Dark grayish brown (10YR 4/2); silty clay loam; weak; medium, subangular blocky structure; non-sticky; noncalcareous; gradual and wavy lower boundary.

Layer 6 Dark grayish brown (10YR 4/2) with large, common yellowish brown (10YR 5/6) mottles; clayey silt; fine to medium, moderate crumb structure; slightly sticky; noncalcareous; abundant fine roots; diffuse and wavy lower boundary.

NORTH WALL
BACKHOE TRENCH
1

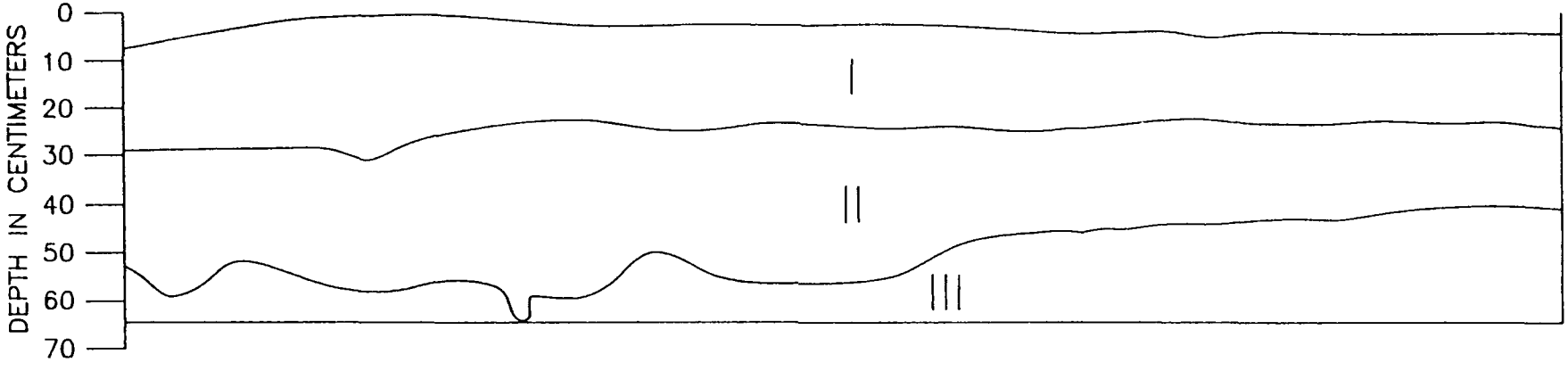


I: DARK GRAYISH BROWN (10YR 4/2) ABUNDANT, LARGE TO FINE, DARK YELLOWISH BROWN (10YR 4/4) MOTTLES; SILT LOAM (SOME VERY FINE SAND PRESENT); MASSIVE AND STRUCTURELESS; NONSTICKY; NONCALCAREOUS; SCATTERED LARGE ROOTS WITH YELLOWISH BROWN (10YR 5/8) SEDIMENTS AROUND THEM.

II: DARK BROWN (10YR 4/3) GRADING DOWNWARD TO DARK GRAYISH BROWN (10YR 4/2); SILTY CLAY LOAM; FINE, MODERATE, SUBANGULAR BLOCKY STRUCTURE; SLIGHTLY STICKY TO NONSTICKY; NONCALCAREOUS; SCATTERED LARGE ROOTS; GRADUAL AND IRREGULAR LOWER BOUNDARY.

III: BLACK, (10YR 2/1); SILT LOAM; MEDIUM, MODERATE, CRUMB STRUCTURE; NONSTICKY; NONCALCAREOUS; ABUNDANT FINE ROOTS IN UPPER 10 CM; CLEAR AND WAVY (TO IRREGULAR) LOWER BOUNDARY.

NORTH WALL
BACKHOE TRENCH
2

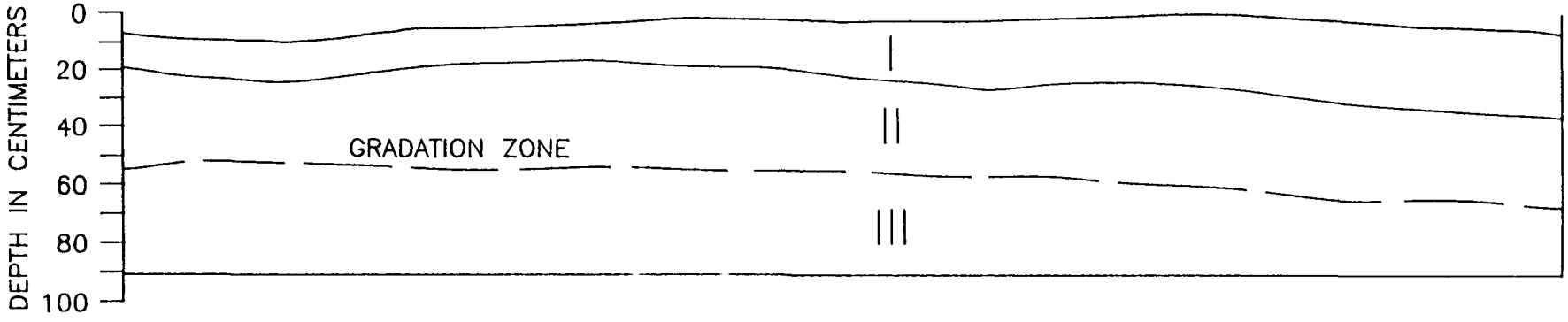


I: DARK GRAYISH BROWN (10YR 4/2) ABUNDANT, LARGE TO FINE, DARK YELLOWISH BROWN (10YR 4/4) MOTTLES; SILT LOAM (SOME VERY FINE SAND PRESENT); MASSIVE AND STRUCTURELESS; NONSTICKY; NONCALCAREOUS; SCATTERED LARGE ROOTS WITH YELLOWISH BROWN (10YR 5/8) SEDIMENTS AROUND THEM.

II: DARK BROWN (10YR 4/3) GRADING DOWNWARD TO DARK GRAYISH BROWN (10YR 4/2); SILTY CLAY LOAM; FINE, MODERATE, SUBANGULAR BLOCKY STRUCTURE; SLIGHTLY STICKY TO NONSTICKY; NONCALCAREOUS; SCATTERED LARGE ROOTS; GRADUAL AND IRREGULAR LOWER BOUNDARY.

III: BLACK, (10YR 2/1); SILT LOAM; MEDIUM, MODERATE, CRUMB STRUCTURE; NONSTICKY; NONCALCAREOUS; ABUNDANT FINE ROOTS IN UPPER 10 CM; CLEAR AND WAVY (TO IRREGULAR) LOWER BOUNDARY.

WEST WALL
BACKHOE TRENCH
3



I: GRAY (10YR 5/1) WITH MANY, FINE TO LARGE DARK YELLOWISH BROWN (10YR 4/4 TO 4/6) MOTTLES; SILTY CLAY LOAM GRADING DOWNWARD INTO SILT LOAM; MASSIVE; NONSTICKY, NONCALCAREOUS.

II: DARK GRAYISH BROWN (10YR 4/2); SILTY CLAY LOAM; WEAK, MEDIUM, SUBANGULAR BLOCKY STRUCTURE; NONSTICKY; NONCALCAREOUS; GRADUAL AND WAVY LOWER BOUNDARY.

III: DARK GRAYISH BROWN (10YR 4/2) WITH LARGE, COMMON YELLOWISH BROWN (10YR 5/6) MOTTLES; CLAYEY SILT; FINE TO MEDIUM, MODERATE CRUMB STRUCTURE; SLIGHTLY STICKY; NONCALCAREOUS; ABUNDANT FINE ROOTS; DIFFUSE AND WAVY LOWER BOUNDARY.

LOGS OF AUGER TESTS HA-1 AND HA-2

Auger Test HA-1

Auger test HA-1 was placed within the middle of an embankment or short bridge across a wide channel located on the north side of Bayou L'Ours Mounds, Site 16LF54. The channel connects the course of the West Fork of Bayou L'Ours with the marsh on the southwest side of the distributary ridge. It cuts through the natural levee and lacks any indication of an associated crevasse distributary or splay.

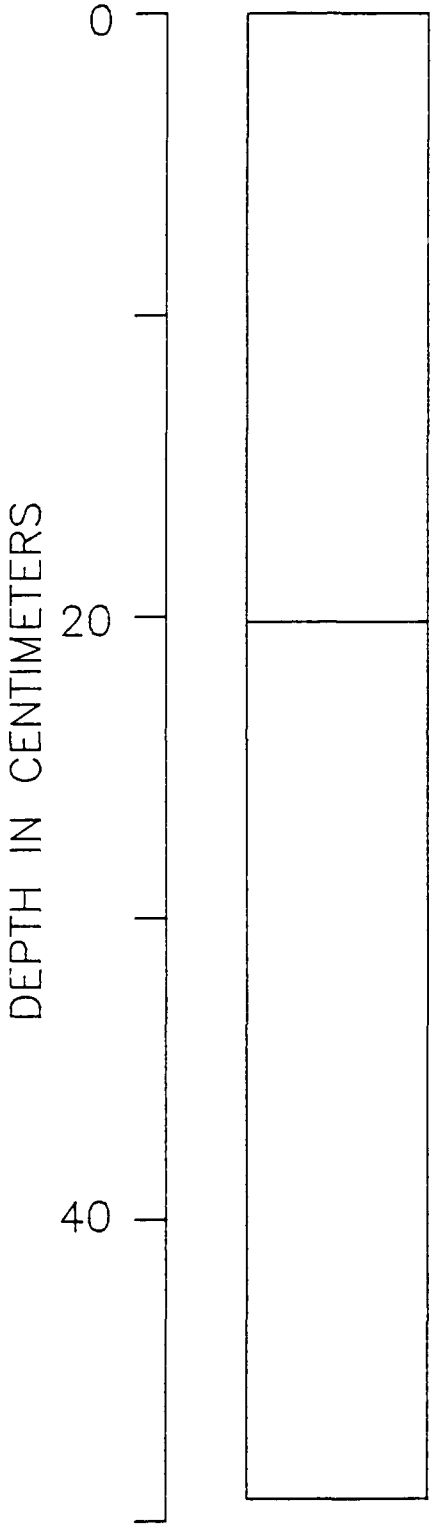
The embankment was used as a platform from which to sample the sediments that underlie the channel in order to acquire evidence concerning the origin of the channel and the nature of the material composing the embankment.

Auger Test HA-2

Auger Hole HA-2 was placed on the side of the same embankment as HA-1. HA-2 was drilled in another attempt to auger into the bottom of the channel and obtain evidence concerning its origin.

The organic material recovered from the channel bottom was discovered to be identical to the organic material found at a depth of 65 to 80 cm in HA-2. The channel was 60 to 70 cm deep at its midpoint.

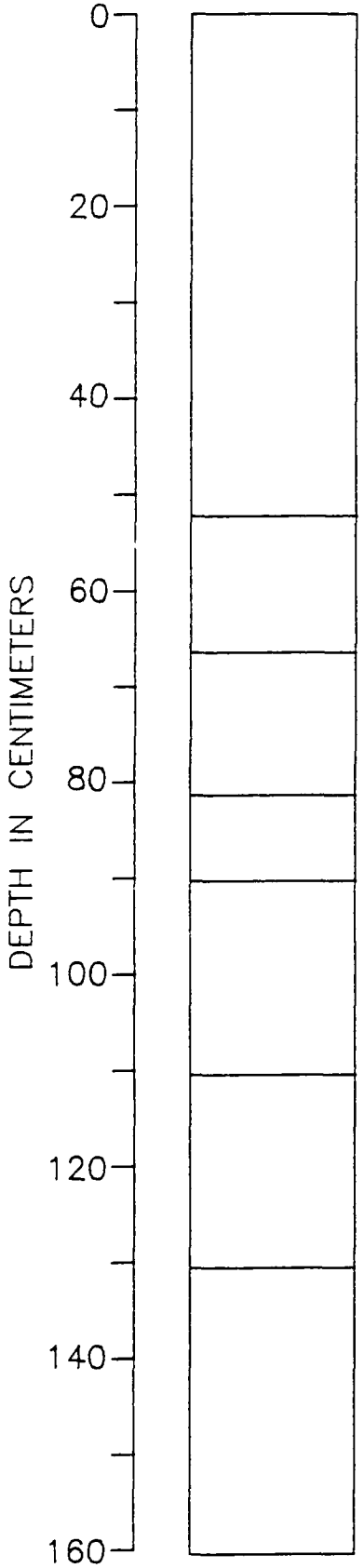
AUGER TEST
1



10YR 3/1 VERY DARK GRAY SILT CLAY LOAM MOTTLED WITH 10YR 4/6 YELLOWISH BROWN SILTY CLAY AND 10YR 4/2 DARK GRAYISH BROWN SILTY CLAY; CONTAINS SHELL FRAGMENTS.

10YR 3/1 VERY DARK GRAY SILTY CLAY LOAM MOTTLED WITH 10YR 4/6 DARK YELLOWISH BROWN SILTY CLAY.

AUGER TEST
II



10YR 3/1 VERY DARK GRAY SILTY LOAM WITH STREAKS OF 10YR 4/6 DARK YELLOWISH BROWN SILTY CLAY; SHELL FRAGMENTS IN UPPER 5 TO 15 CM; INCREASING MOISTURE AT 25 CM.

5Y 4/1 DARK GRAY SILTY CLAY LOAM MOTTLED WITH 10YR 4/6 DARK YELLOWISH BROWN SILTY CLAY.

BROWN DECAYING MASS OF DETRITAL WOOD AND RECENT AQUATIC PLANT MATERIAL MIXED WITH SOME SEDIMENT (CLAYEY SILT?)

10YR 3/1 VERY DARK GRAY SILTY CLAY LOAM MOTTLED WITH 7.5YR 4/6 SILTY CLAY.

10YR 4/1 DARK GRAY SILT LOAM MOTTLED WITH 7.5YR 4/6 STRONG BROWN SILT.

10YR 4/1 DARK GRAY SILT LOAM OR SANDY LOAM.

5BG 5/1 GREENISH GRAY SILTY CLAY MOTTLED WITH 10YR 5/6 DARK YELLOWISH BROWN SILTY CLAY.