AD-A242 489



Cultural Resources Series
Report Number COELMN/PD-90/12

US Army Corps
of Engineers
New Orleans District

HISTORICAL AND ARCHEOLOGICAL INVESTIGATIONS OF FORT BISLAND AND LOWER BAYOU TECHE, ST. MARY PARISH, LOUISIANA

JUNE 1991

FINAL REPORT

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PREPARED FOR:

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New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

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91-14439



91 10 29 029

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified.	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION / AVAILABILITY OF REPORT Unclassified. Distribution is unlimited.
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S) COELMN/PD-90/12
6a. NAME OF PERFORMING ORGANIZATION R. Christopher Goodwin & Associates, Inc.	6b. OFFICE SYMBOL (If applicable)
	7a. NAME OF MONITORING ORGANIZATION U.S. Army Corps of Engineers New Orleans District
6c. ADDRESS (City, State, and ZIP Code) 5824 Plauche Street New Orleans, LA 70123	7b. ADDRESS (City, State, and ZIP Code) P.O. Box 60267 New Orleans, LA 70160-0267
8a. NAME OF FUNDING / SPONSORING ORGANIZATION U.S. COE New Orleans District	8b. OFFICE SYMBOL (If applicable) CELMN-PD-RA
	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DACW29-88D-0121 Delivery Order 08
8c. ADDRESS (City, State, and ZIP Code) P.O. Box 60267 New Orleans, LA 70160-0267	10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
N/A	CIVIL	WORKS	FUNDING

11. TITLE (Include Security Classification) HISTORICAL AND ARCHEOLOGICAL INVESTIGATIONS OF FORT BISLAND AND LOWER BAYOU TECHE, ST MARY PARISH, LOUISIANA

12. PERSONAL AUTHOR(S) R. Christopher Goodwin, Stephen Hinks, William P. Athens, Ralph Draughon, Jr., Paul V. Henrich, Allen R. Saltus, Jr., and William A. Morgan, and Jennifer A. Cohen

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM _____ TO _____	June 1991	388

16. SUPPLEMENTARY NOTATION

17. COSATI CODES		
FIELD	GROUP	SUB-GROUP
05	06	

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)

Avalon Plantation, Bisland battlefield, Luckland Plantation, Zenor, Bayou Teche, Calumet Plantation, Moro Plantation, Bethel (I and II), Delta, Natural levee

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

From March through June 1990, R. Christopher Goodwin & Associates, Inc. conducted a cultural resources survey of the Lower Bayou Teche Project and portions of the Fort Bisland battlefield, located along Bayou Teche in St. Mary Parish, Louisiana. The survey was performed for the U.S. Army Corps of Engineers, New Orleans District, pursuant to Delivery Order 08, Contract No. DACW29-88-D-0121. Survey entailed auger testing, intensive pedestrian survey augmented with systematic shovel testing, marine and terrestrial magnetometer survey, metal detector survey, and archeological test excavation at identified sites. Seven archeological sites were identified during survey of the Bayou Teche area, and an eighth site, Bisland Battlefield (16SMY166), was examined. The identified sites include two antebellum plantation sites, Bethel I (16SMY68) and Bethel II (16SMY69); four postbellum and early twentieth century plantation and small landowner sites, Moro Plantation (16SMY73), Zenor (16SMY72), Luckland Plantation (16SMY71), and Avalon Plantation (16SMY70); and, one twentieth century site, Calumet (16SMY67). Two of these sites possess the quality of significance as defined by the National Register of Historic Places: Luckland Plantation (16SMY71), and Avalon Plantation (16SMY70). It is recommended that dredged material be confined to the southern edge of Luckland Plantation and the eastern third and southern edge of Avalon Plantation. The Bethel II site contains potentially significant deposits that are located just north of the proposed disposal area; special care should be taken to avoid this area. Due to limited testing at Moro Plantation, it is uncertain as to whether the site is significant or not; if dredge disposal is confined to the area between the ridge and the lower half of the natural levee and Bayou Teche, the primary occupation area can be avoided. The remainder of the terrestrial sites identified during this survey, as well as the portion of Bisland Battlefield (16SMY166) located within the project corridor, do not possess the quality of significance as defined by the National Register of Historic Places, and no further testing is recommended. Finally, 12 potentially significant riverine magnetic anomalies were found within or near the planned channel corridor. Further testing is recommended at each of these anomalies.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ OTIC USERS	

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code)	22c. OFFICE SYMBOL
Carroll H. Kleinhans	504-862-2548	CELMN-PD-RA

DD Form 1473, JUN 86 *Previous editions are obsolete.* SECURITY CLASSIFICATION OF THIS PAGE

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

December 21, 1990

Planning Division
Environmental Analysis Branch

To The Reader,

This cultural resources effort was designed, funded, and guided by the U.S. Army Corps of Engineers, New Orleans District as part of our cultural resources management program. The work documented in this report was a mix of several investigative approaches designed to address the full range of cultural resources existing along the lower reaches of Bayou Teche. These resources include the Bisland Civil War Battlefield, historic plantations and related structures along the banks of the bayou, prehistoric sites, and sunken historic boats located in Bayou Teche.

We concur with the recommendations contained in this report. Additional investigations of the potentially significant magnetic anomalies has recently been completed. The three plantation sites recommended for avoidance; Moro, Luckland and Avalon; will either be deleted from the proposed disposal areas or, if that is not feasible, they will be subject to additional testing and, if necessary, mitigation.

The analyses presented in this report are thorough and of high quality. We compliment the contractor on a job well done.

Michael E. Stout
Technical Representative

Carroll H. Kleinhans
Authorized Representative
of the Contracting Officer

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

HISTORICAL AND ARCHEOLOGICAL INVESTIGATIONS OF FORT BISLAND AND LOWER BAYOU TECHE, ST. MARY 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, Allen R. Saltus, Jr., and Paul V. Heinrich

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5824 Plauche Street
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For

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Cultural Resources Series
Report Number COELMN/PD-90/12

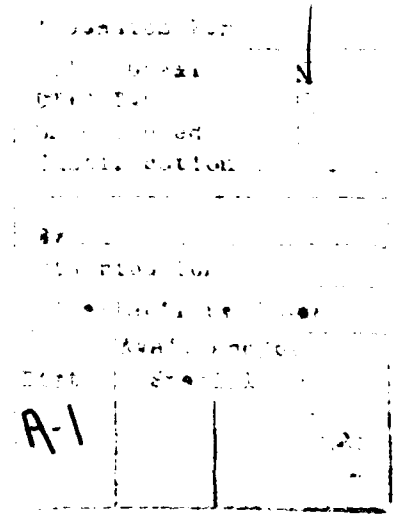




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ACKNOWLEDGMENTS

We would like to express our gratitude to those individuals and organizations who gave their time and effort to assist us in developing this report. Mr. Mike Stout, COTR, provided valuable advice throughout the project. Ms. Carroll H. Kleinhans served as COR. Mrs. Maria Guarisco, granddaughter of Oscar Zenor, provided the photo of the steamship *Peri* docked at Avalon Plantation. We also thank the staff of the Louisiana Division of Archaeology, and the staff of the Louisiana Collection at tne Howard-Tilton Memorial Library, Tulane University.

At R. Christopher Goodwin & Associates, Inc., William P. Athens served as Project Manager. Stephen Hinks supervised the field investigations. Field investigators included David G. Funk, Richard B. White, Alan R. Green, Jr., Jeffrey J. White, James M. Wojtala, Billy Bernstein, Colby A. Child, Jr., Paul J. Hughbanks, Douglas C. Wells, and William A. Morgan. Shirley J. Rambeau, Karen L. Adoue, and Cara Robertson prepared the graphic materials. Finally, Lyn O'Brien, K. J. Belcher, and Christine Herman produced this report.

CHAPTER I

INTRODUCTION

This report presents the results of a cultural resources survey of the Lower Bayou Teche Project, and portions of the Fort Bisland Battlefield, located along Bayou Teche in St. Mary Parish, Louisiana (Figure 1). This survey was conducted from March through June 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.

The current investigations are designed to provide cultural resources data for two separate U.S. Army Corps of Engineers projects. The first of these projects consists of dredging Bayou Teche from its confluence with the Lower Atchafalaya River to the Wax Lake Outlet (River Miles 0-5). Dredging will maintain an existing navigation channel, approximately 80 ft (24.4 m) wide, and 8 ft (2.4 m) deep; this corridor was dredged twice previously, in 1941 and 1964. Maintenance dredging, planned for the summer of 1991, will impact both the bayou channel and the dredge disposal areas situated along both banks of Bayou Teche (Appendix I).

The second U.S. Army Corps of Engineers project supported by this research is the Atchafalaya Basin, Louisiana project. Two elements of this project, the Wax Lake Outlet and the W-112 levee item, both of which were constructed in the 1940s, probably caused adverse impacts to the Bisland battlefield. While no immediate construction or maintenance are scheduled for these items, continued bankline erosion along the Wax Lake Outlet potentially threatens archeological deposits associated with the battlefield. Archeological investigations within the W-112 levee item area are designed to provide data necessary for assessing impact to potentially significant portions of the battlefield (Appendix I).

Prior to field survey, historical research and literature review were performed. Geomorphological, archeological, cartographic, photographic, and historical data were collected (Goodwin, Hinks et al. 1990). These data were used to prepare a set of geomorphological and archeological expectations for the two project areas, and to refine survey methodologies.

Fieldwork had several components. A marine magnetometer survey was conducted along lower Bayou Teche. Proposed disposal areas were examined for cultural resources using intensive pedestrian survey and systematic shovel testing. Two of the proposed disposal areas fall within the Bisland battlefield; they also were tested with a magnetometer and a metal detector. Depths of previously deposited dredged material within the W-112 levee item also were assessed through systematic auger testing; and, portions of the W-112 levee item area were tested utilizing systematic shovel testing and

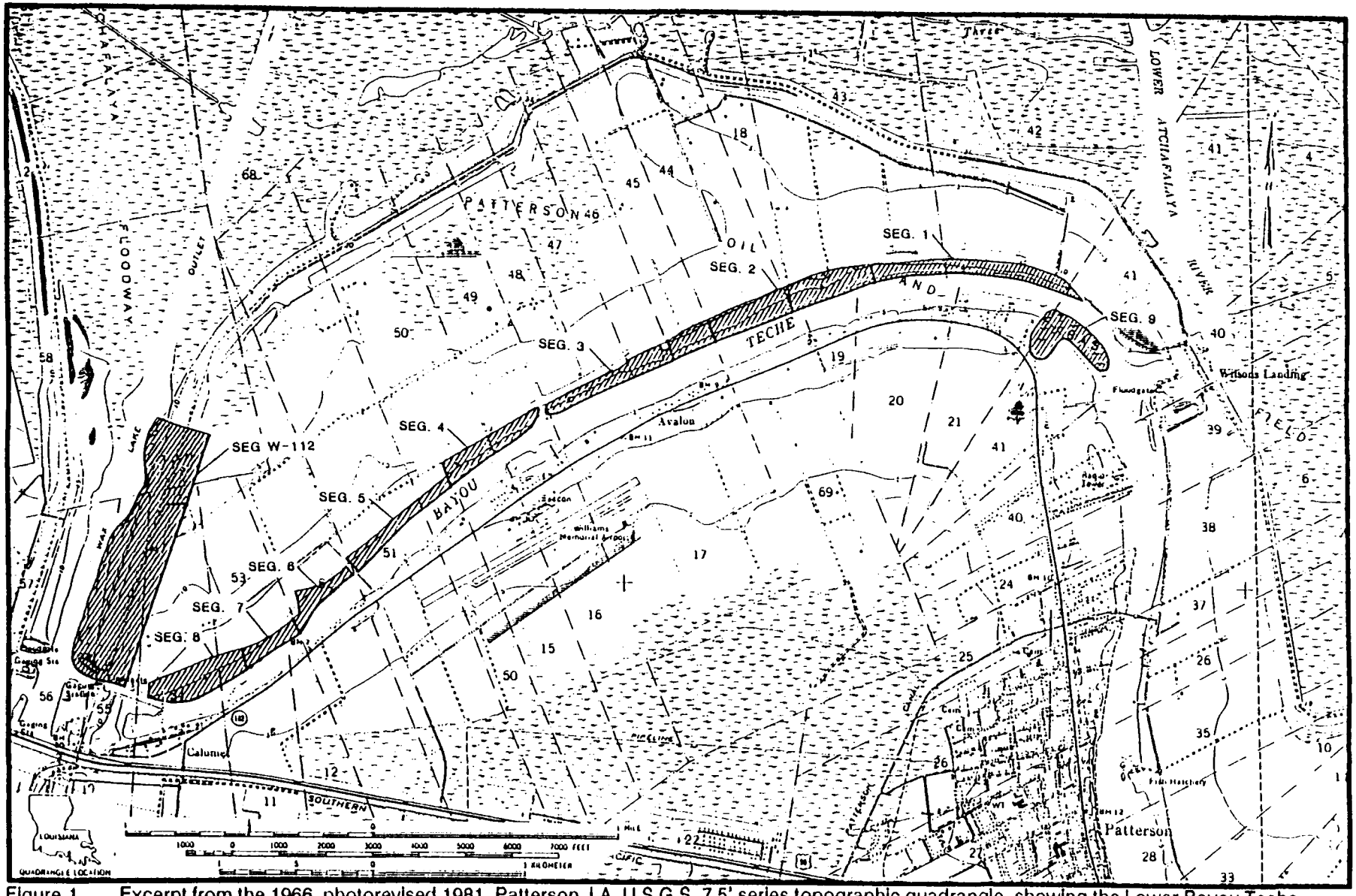


Figure 1. Excerpt from the 1966, photorevised 1981, Patterson, LA, U.S.G.S. 7.5' series topographic quadrangle, showing the Lower Bayou Teche and Bisland battlefield project areas.

pedestrian, magnetometer, and metal detector survey. Finally, additional testing, including archeological test excavation, was conducted at several identified sites to define their horizontal and vertical extent, and to assess research potential.

A total of 415 acres and 5.0 river miles were surveyed for cultural resources. During survey, seven archeological sites were identified, and portions of an eighth site, the Bisland Battlefield (16SMY166), were examined. The identified sites included two probable antebellum plantation sites, Bethel I (16SMY68) and Bethel II (16SMY69); four postbellum and early twentieth century plantation and small landowner sites, Moro Plantation (16SMY73), Zenor (16SMY72), Luckland Plantation (16SMY71), and Avalon Plantation (16SMY70); and, one twentieth century site, Calumet (16SMY67).

CHAPTER II

REGIONAL GEOLOGY AND GEOMORPHOLOGY

Introduction

The project area lies within an area underlain by both the Maringouin and Teche delta complex. Since the time of their development, the area has undergone substantial change. After the Teche-Mississippi River abandoned its course, it then was replaced by the Teche-Red River and, later, by the Bayou Teche. This chapter examines both the archeological and geomorphological events, and cultural development within the area and assesses their impact on the archeological resources of the project area.

Pleistocene History and Geomorphology

During the entire Quaternary Period, the accumulation and dissolution of continental ice sheets caused eustatic sea level to fluctuate between -20 to -70 m. As a result, the shoreline migrated as much as 180 km back and forth across the Louisiana Continental Shelf. The maximum high sea level stands occurred during interglacial periods associated with the Holocene Stage and parts of the Sangamonian Stage. The Ingleside-Pamlico Barrier Island Chain marks the shoreline formed by the highest Sangamonian Stage sea level stand (Autin et al. 1990; Suter et al. 1987).

During the Late Wisconsinan Stage (around 21,000 years ago), sea level dropped by approximately 120 m below current levels. As a result, the shoreline moved to a position 150 to 170 km south of Belle Isle subaerially exposing large areas of the continental shelf. Fluvial systems flowed across the Central Louisiana Continental Shelf, entrenched it, and formed deep valleys. For example, the Mississippi River cut a valley over 100 m deep and 15 to 40 km wide into the coastal plain, subaerially exposing the continental shelf.

During the later part of the Wisconsinan Stage, sea level rose from approximately -120 m at about 20,000 B.P. to -30 m by 10,000 years ago. As sea level rose, a sequence of fluvial, estuarine, and marine deposits filled the entrenched Mississippi River Valley. As the shoreline migrated landward, its shoreface eroded the upper 5 to 10 m of the formerly exposed continental shelf and the upper fill of the Mississippi River Valley, forming a ravinement or erosional surface (Suter et al. 1987).

Mississippi Delta Chronology

During the Holocene Epoch, the Mississippi Deltaic plain formed from a series of delta complexes constructed by the Mississippi River. Each complex consisted of a cluster of deltas associated with a previous course of the Mississippi River. These clusters formed from the switching of the locus of deposition at the end of a specific river course. When a river course was abandoned, the associated delta complex also became inactive since it was deprived of its source of sediment and water. The new river course, in turn, created a new delta complex. If sea level remained unchanged, the active delta complex then would coalesce with the previous delta complex to form a common geomorphic surface (Frazier 1967).

Sediments of both the Maringouin and Teche delta complexes underlie the project area. During a period of stable eustatic sea level, the Maringouin delta complex prograded southward across the project area to a position 50 km southwest of Belle Isle. When sea level rose, marine processes eroded and reworked the delta plain of the Maringouin delta complex and formed a ravinement surface upon which the Tiger and Trinity Shoals rest. Then, from 6,000 years ago to 3,400 years ago, the Mississippi River formed the Metairie delta complex in southeast Louisiana and the Teche delta complex at and then east of Marsh Island during a period of stable sea level (Figures 2 and 3). The initial progradation of the Teche delta complex occurred approximately 5,800 to 4,000 years ago within the project area. As the Teche Delta prograded to the east-southwest, the Mississippi River established a course that eventually became Bayou Teche (Frazier 1967; Smith et al. 1986).

Since the abandonment of the Teche delta complex, eustatic sea level rose by 6 m. As a result, the delta plain of the Teche delta complex sunk to form Atchafalaya Bay; portions of the complex are buried underneath an accumulation of marsh deposits and sediments originating from the adjacent Lafourche delta complex. Relative sea level within the project region continues to rise, although eustatic sea levels have stabilized at a rate that varies from 9.1 cm/100 years within the Wax Lake area to 15.2 cm/year just west of the Lower Atchafalaya Outlet. The increase in relative sea level within the project area reflects the thickness of Holocene Age sediments within the Late Wisconsinan Mississippi Valley (Penland et al. 1988).

Development of Bayou Teche

According to Saucier (1974), Bayou Teche represents the abandoned course of the Teche-Mississippi River (Meander Belt No. 3). This course developed approximately 6,000 years ago as a result of the abrupt diversion of the Mississippi River within the Memphis region. Because the Teche-Mississippi River course was the sole source of sediment and water to the Teche delta complex, the active progradation of the Teche delta complex required that the Teche-Mississippi River be active within Meander Belt No.

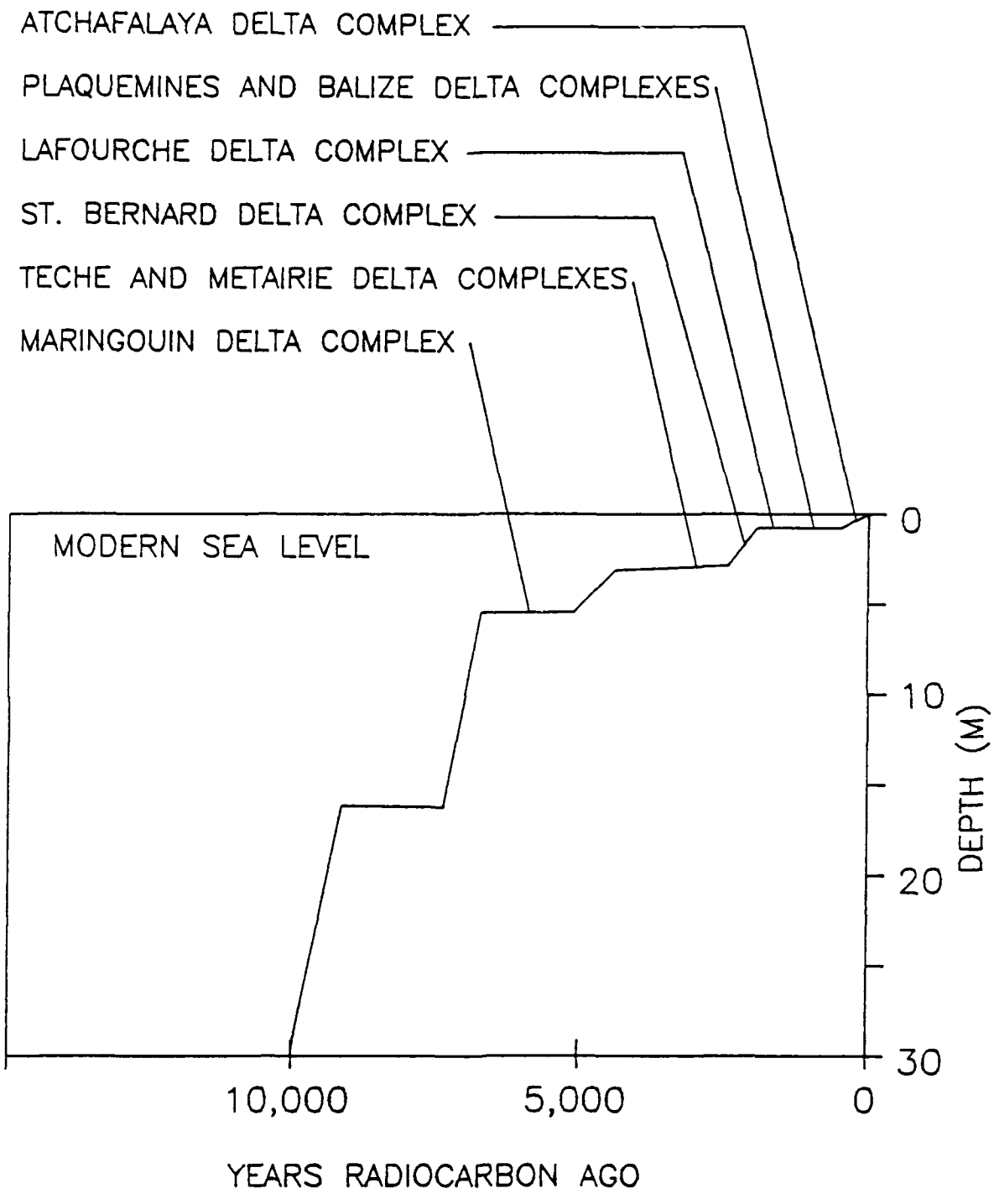


Figure 2. Chronology of delta complexes and relative sea level rise.

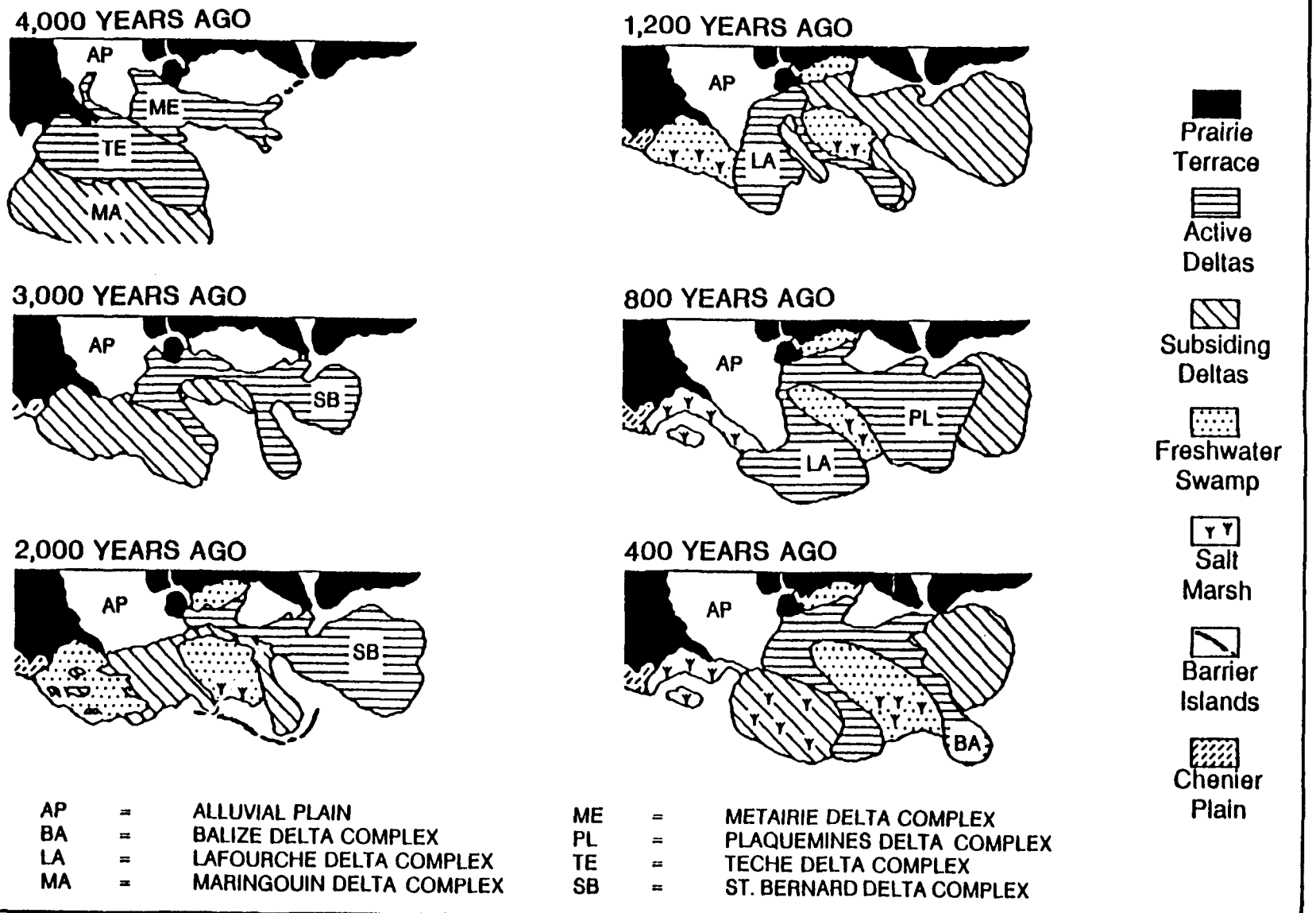


Figure 3. Paleogeography of the Mississippi River Delta.

3. If the Teche delta complex was active until approximately 3,500 years ago (Frazier 1967, 1974), then Bayou Teche must have been the active course of the Teche-Mississippi River. At that time, rising sea level probably caused the Teche-Mississippi River to abandon Bayou Teche and the Teche delta complex.

Even though the Teche-Mississippi River abandoned its channel, the Teche-Red River continued to flow down Bayou Teche. Previous investigators, e.g., Saucier (1974), Fisk (1952), and Lenzer (1977), proposed that the Teche-Red River diverted from Bayou Teche to its present course through Moncla Gap approximately 500 to 2,400 years ago. Archeological data demonstrate that this diversion probably occurred between 2,000 and 1,800 years ago (Pearson et al. 1986a).

Lenzer (1977) concluded that the full discharge of the Red River occupied Bayou Teche. However, if the full discharge of the Red River flowed down Bayou Teche from 3,400 to 2,000 years ago, noticeable modifications to the channel should be apparent (Dury 1964; 1965). Examination of aerial photography and geological cross-sections, e.g., Gould and Morgan (1962), shows that the Teche-Red River passively filled the lower part of the Bayou Teche course of the Mississippi River without significantly modifying either the cross-section of its channel or the morphology of its meanders (Figures 4 and 5). The lack of modification to the Teche-Mississippi channel suggests that only small transitory or partial discharges of the Teche-Red River flowed down Bayou Teche to deposit the reddish brown alluvium now found along the banks of Bayou Teche. The partial diversion of the Teche-Red River by the Vermillion River partially explains the reduced discharge of the ancient Red River within the project area (Van Lopik 1955).

Natural Levees of Bayou Teche

The abandonment of Bayou Teche, first by the Teche-Mississippi River and later by the Teche-Red River, created a unique natural levee complex that consists of as many as three natural levees flanking both sides of Bayou Teche. From the center of Bayou Teche outward, they are informally designated the "outer," "middle," and "inner" natural levees. The outer, middle, and inner natural levees represent natural levees, respectively, formed by sediments deposited sequentially by the Teche-Mississippi, Teche-Red River, and Bayou Teche (Figure 4; Gould and Morgan 1962; Morgan 1976). The chronology of the Mississippi and Red Rivers can be used to estimate the general age of the surface of each natural levee and the age range of the sediments that form them (Figure 6).

The "inner natural levee" occurs along a narrow channel of Bayou Teche starting about 65 km upstream of the project area. The inner natural levee represents the modern, actively aggrading natural levee of Bayou Teche. Unlike the relict outer and middle natural levees, the inner natural levee is the site of active sedimentation. The inner natural levee is lacking from the project area, because it occurs only where the

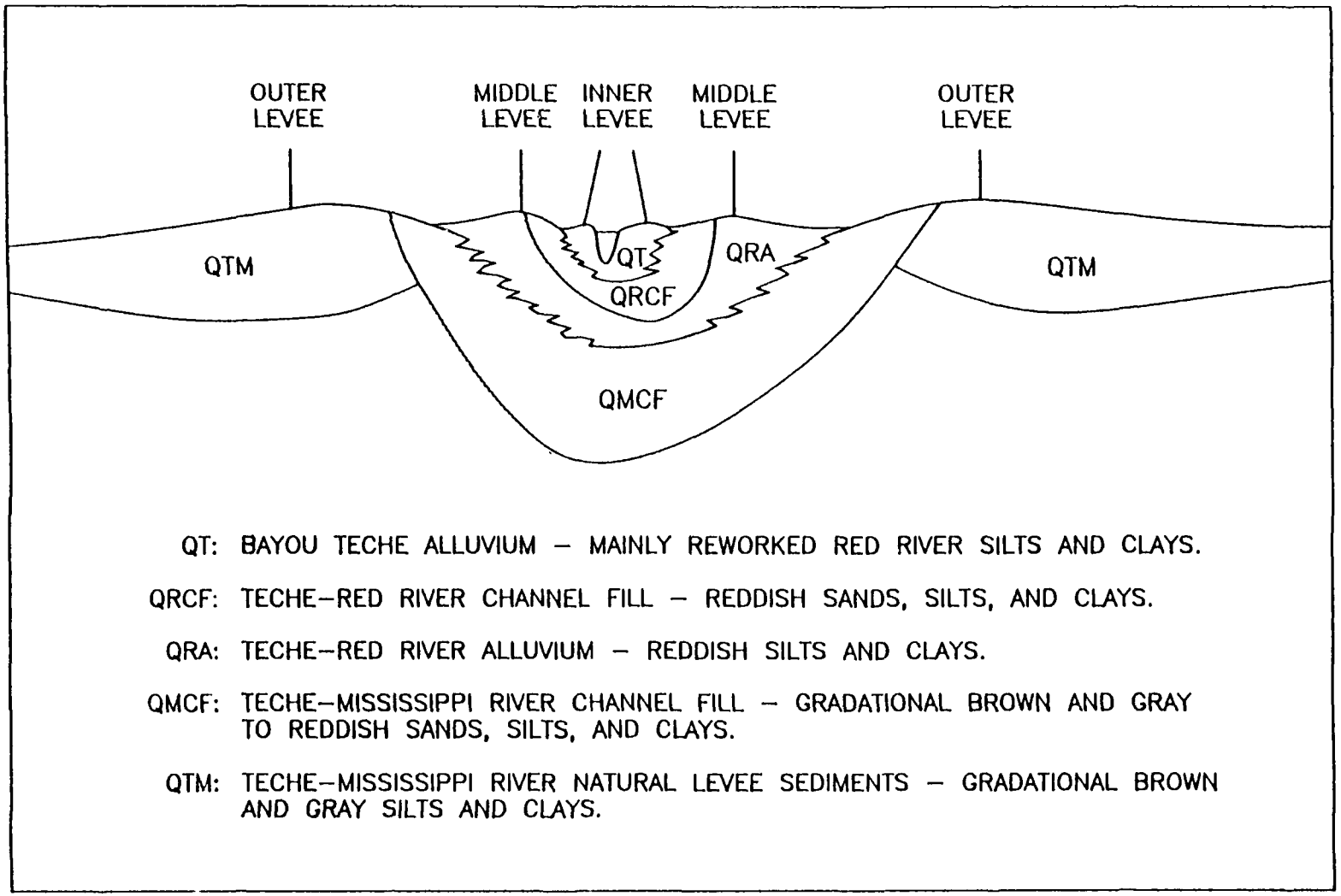
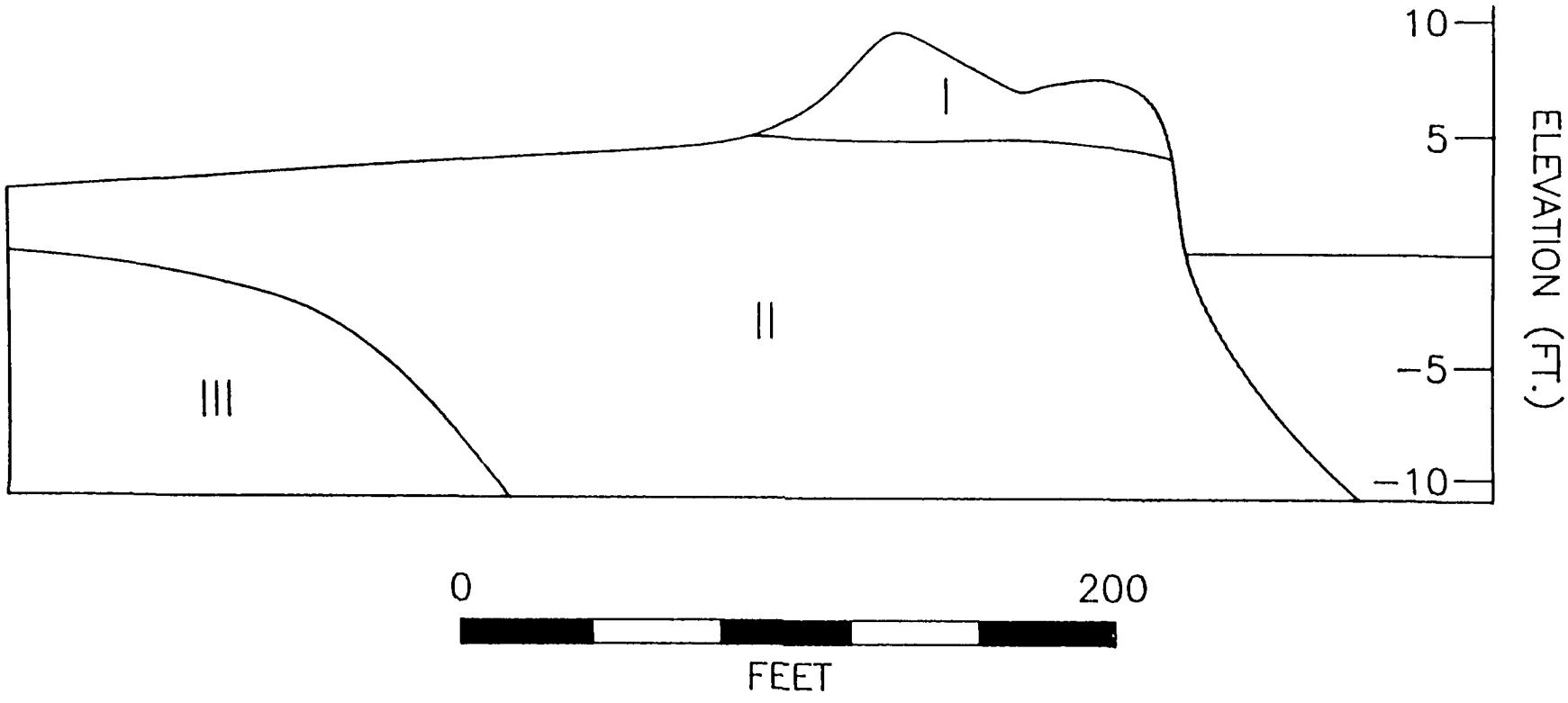


Figure 4. Diagrammatic Cross-Section of Bayou Teche at St. Martinsville and adjacent to the project area showing the relationships between natural levees and the deposits of the Mississippi River, the Red River and Bayou Teche. Modified from Gould and Morgan (1962).



I: COLES CREEK SHELL MIDDEN

II: TECHE–RED RIVER ALLUVIUM

III: TECHE–MISSISSIPPI RIVER ALLUVIUM

Figure 5. Diagrammatic Cross-Section of Bayou Teche at St. Martinsville and adjacent to the project area showing the relationships between recent alluvial formations. Modified from Gould and Morgan (1962).

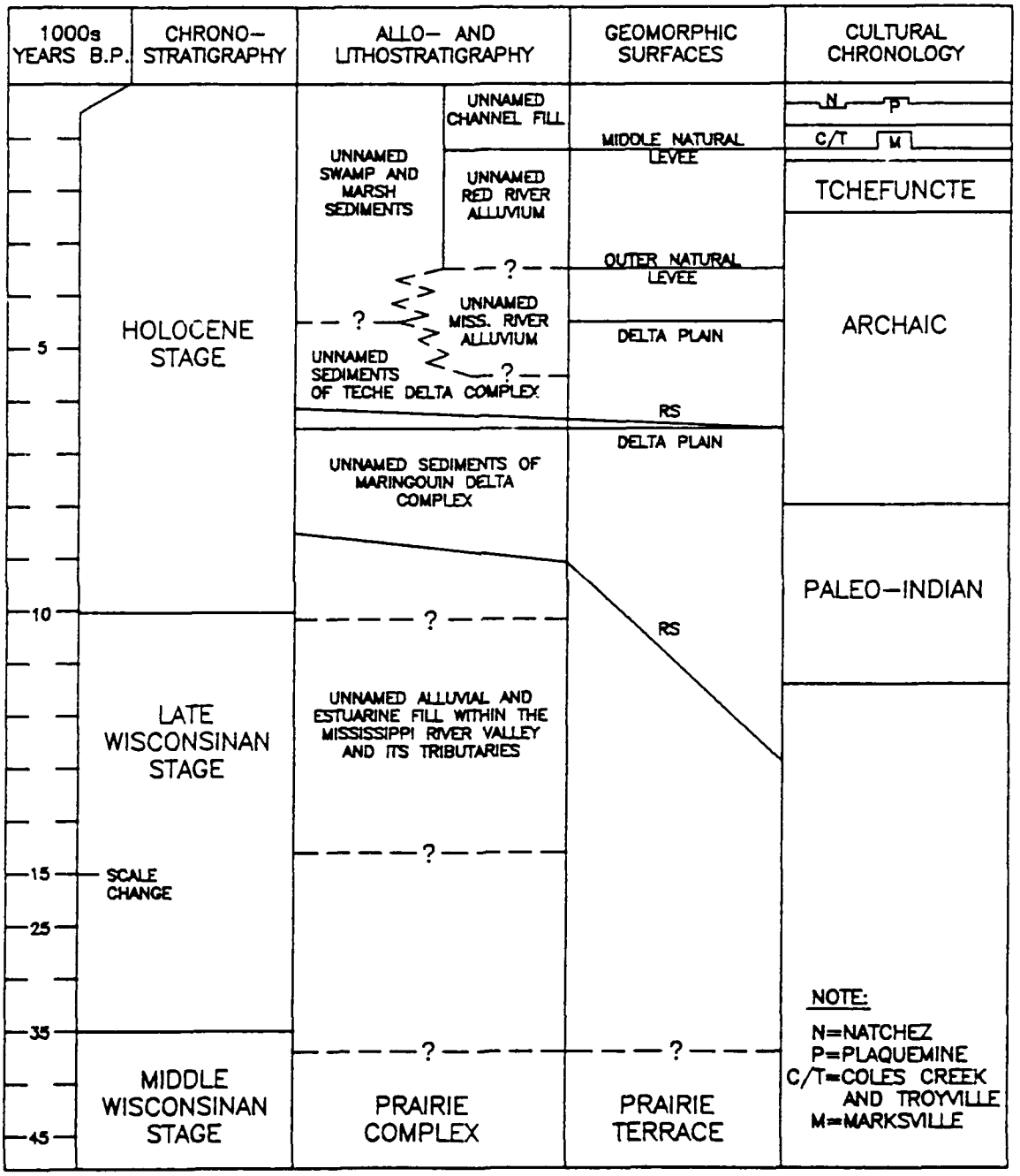


Figure 6. Local stratigraphy of Late Quaternary sediments within the study area. Lithostratigraphy derived from Frazier (1967, 1974), Weinstein and Gagliano (1985), and Penland et al. (1987) and chrono-stratigraphy from Sibrava et al. (1986). Note scale change at 15,000 B.P.

abandoned channel of the Teche-Red River has been filled sufficiently to form land (Figure 4; Gould and Morgan 1962).

Between the inner and outer natural levees, the middle natural levee is a relict, very narrow, and steeply sloping natural levee composed of reddish colored alluvium. The middle natural levee consists of and rests upon reddish colored alluvium deposited by the Teche-Red River between 3,500 to 2,000 years ago. This alluvium has a distinctive red color, which is derived from the Permian redbeds of Oklahoma and northeast Texas. The alluvium was deposited as channel fill during the waning stages of the diversion of the Red River from Bayou Teche. Approximately 2,000 years ago, the middle natural levee became a landform when the Teche-Red River abandoned Bayou Teche as its course (Figure 4) (Gould and Morgan 1962; Morgan 1976).

The outer natural levee is a very broad and very gently sloping natural levee composed of gray to brown silts and clays. The outer natural levee consists of overbank sediments deposited by the Teche-Mississippi River between 6,000 and 3,500 years ago. The overbank sediments overlie point bar, channel fill, and backswamp deposits. When the Teche-Mississippi abandoned Bayou Teche as its course approximately 3,500 years ago, the outer natural levee became a relict landform (Figure 4) (Fisk 1952; Gould and Morgan 1962).

The Mississippi River Valley

The buried western edge of the entrenched Mississippi River Valley crosses the project area. From where the Wax Lake Outlet crosses Bayou Teche on the western end of the project area to Patterson on the eastern end of the project area, the eroded surface of the Prairie Complex drops from a depth of approximately 15 m to over 75 m. Unnamed alluvium and estuarine sediments, presumably of Late Wisconsinan Age, fill this entrenched Mississippi River Valley (Figure 6). Below a depth of 90 ft, these sediments consist of sands and gravels (Fisk 1952; Smith et al. 1986).

The Mississippi River cuts into a thick and widespread sequence of Wisconsinan and older depositional units of the Prairie Complex. These depositional units accumulated during several Late Pleistocene transgressive-regressive depositional episodes. The Prairie Complex within the project area and the adjacent Prairie Terrace are either Early or Middle Wisconsinan in age (Figure 6) (Autin et al. 1990).

Project Area Geomorphology

Methodology

Geomorphic investigation of the project area consisted of background literature review and fieldwork. Prior to fieldwork, the area's geomorphology was examined and then mapped using aerial photography, soil surveys, and previous geomorphological maps (Fisk 1952; Lytle et al. 1959; Smith et al. 1986). Observations from Agricultural Stabilization and Conservation Service aerial photography flown in 1940 and 1952 and from Lytle et al. (1959) were plotted on 7.5' topographic maps. Fieldwork consisted of a walkover survey of the project area and auger testing of two survey areas.

Geomorphic Terrains

Five geomorphic terrains exist within the project area. By definition, each geomorphic terrain consists of a mappable portion of surface land that is characterized by a distinctive assemblage of sedimentary deposits. Four of these geomorphic terrains, inappropriately termed "depositional environments" by Smith et al. (1986), are the abandoned channel, natural levee, backswamp, and inland swamp terrains. Except for two natural levee terrains, the landforms and associated sedimentary deposits of these descriptions need not be repeated in this report. Within the project area, an additional terrain, the spoil land terrain, is recognized and described.

Outer Natural Levee Terrain

Within the project area, the outer natural levee forms a broad 0.4 to 1.6 km wide strip along both sides of Bayou Teche (Figure 7). The outer natural levee represents the highest portion of the landscape within the adjacent coastal plain, except for local areas uplifted by underlying salt domes, e.g., Belle Isle. The crests of some parts of the outer natural levee are as high as 12 m above sea level.

The Baldwin, Cypremort, Iberia, and Jeanerette soil series characterize the outer natural levee terrain. These soils are acid; silty, loamy, and clayey; moderately well to poorly drained; and, nearly level with well developed profiles (Lytle et al. 1959). The degree of profile development, acidity, and drainage of the Baldwin and Cypremort series suggests that materials such as bone, shell, and organic material are poorly preserved in the alluvial sediments within this terrain. Within the outer levee terrain, complete and fragmentary crevasse channels are evident (Figure 7). Topography and bifurcating patterns of Cypremort very fine sandy loam and silt loam delineate the location of a Teche-Mississippi River crevasse system on the outer natural levee within Sections 50 and 51 of the left descending bank and Sections 54 and 55 on the right descending bank. Linear patches of Cypremort very fine sandy loam delineate fragments of crevasse

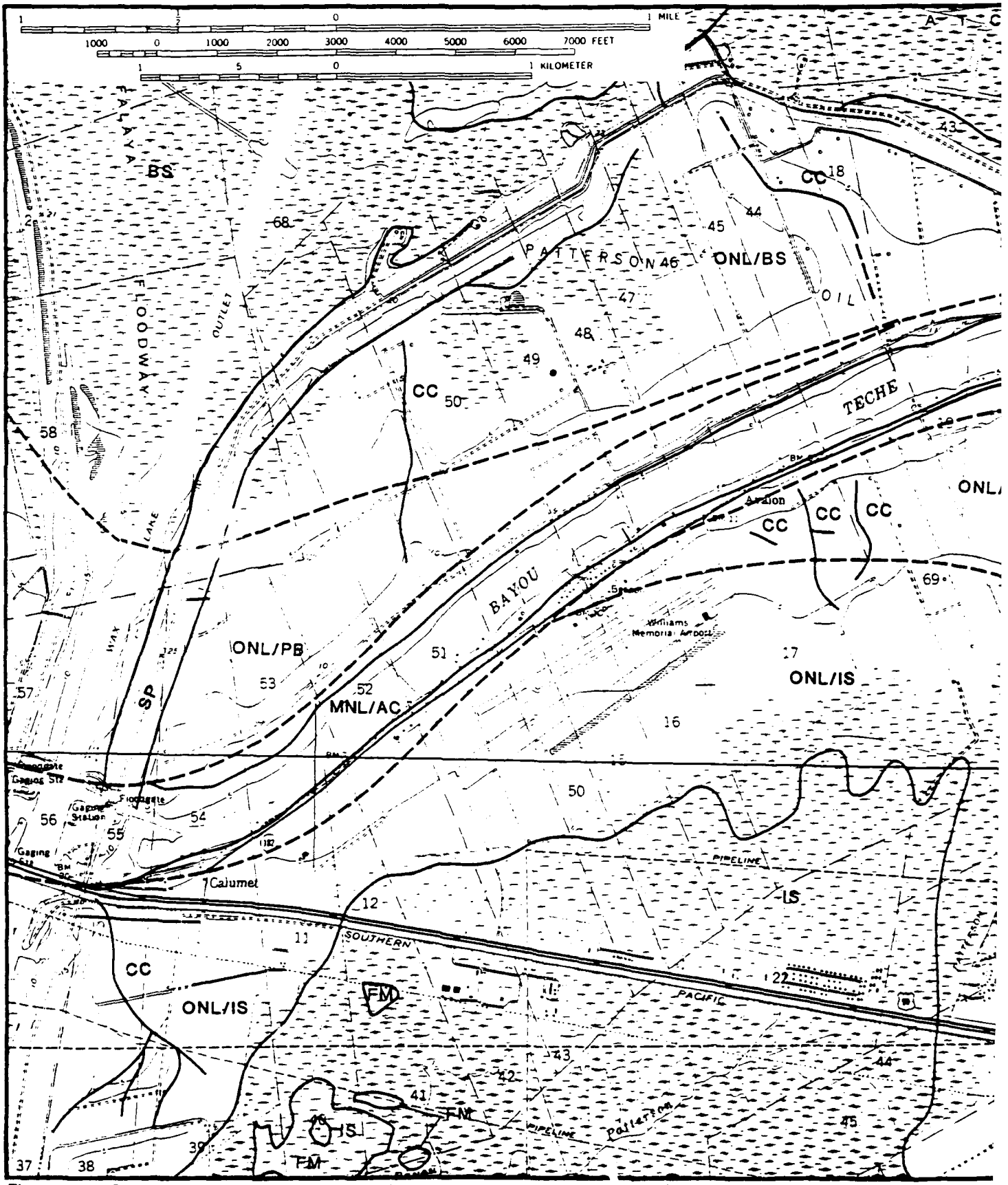
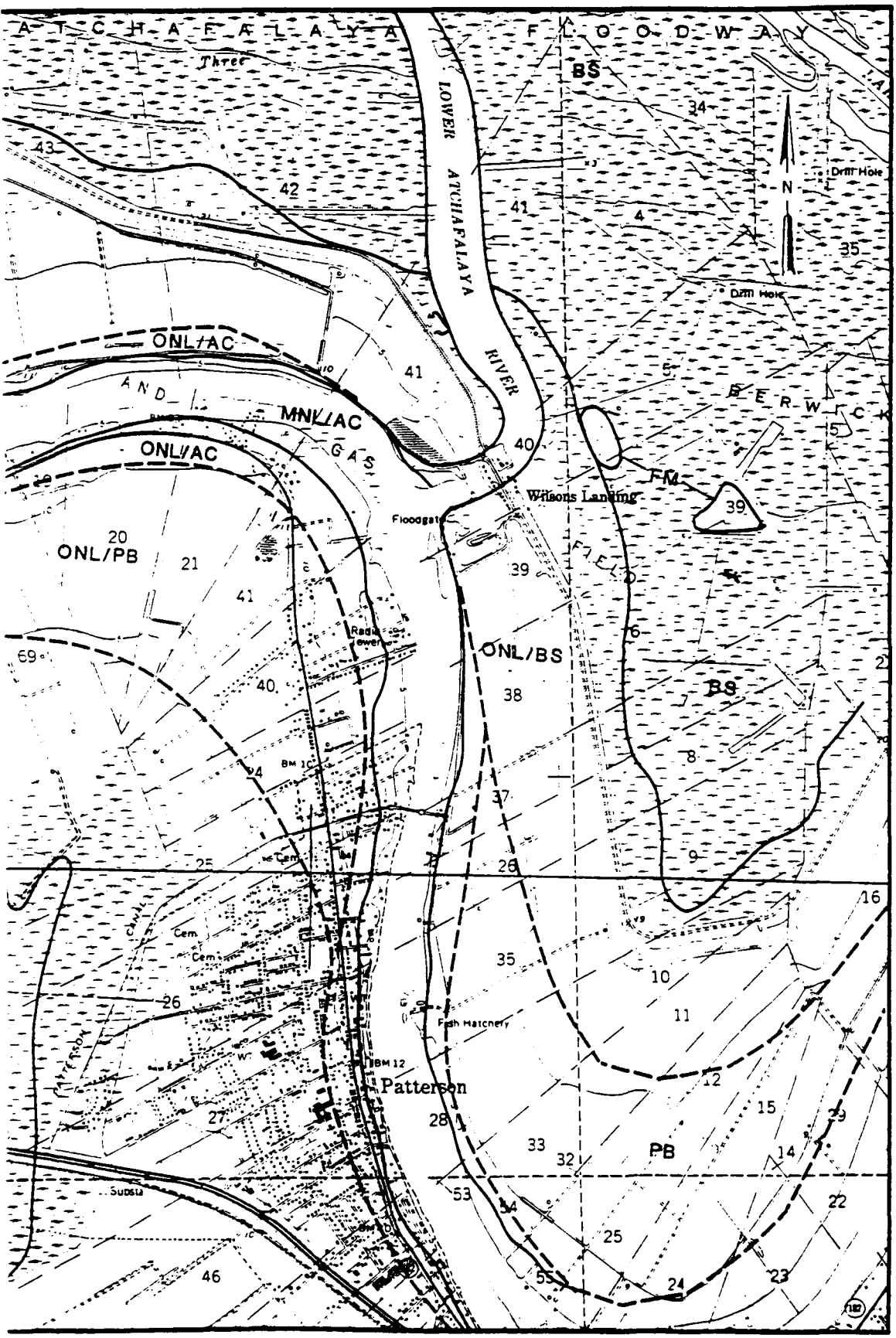


Figure 7. Geomorphic features of the lower Bayou Teche and Bisland battlefield area. Modified from Smith et al. (1986

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LEGEND

— — —	Contact between terrains
———	Contact between underlying sedimentary facies
cc	Crevasse channel
BS	Backswamp
FM	Fresh marsh
IS	Island swamp
MNL	Middle natural levee
MNL/AC	Middle natural levee overlying abandoned channel
ONL	Outer natural levee
ONL/AC	Outer natural levee overlying abandoned channel
ONL/BC	Outer natural levee overlying backswamp
ONL/IS	Outer natural levee overlying inland swamp
ONL/PB	Outer natural levee overlying point bar
SP	Spoil land



et al. (1986).

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channels within Sections 17 and 69 on the outer natural levee of the right descending bank. Within Sections 18 and 44 of the left descending bank, tonal features, the distribution of Baldwin silty clay loam, and topographic contours shown on topographic maps and defined by rice field levees, clearly define the channel and extent of a very large crevasse distributary. This crevasse distributary extends a distance of 2 km from the inside edge of the outer natural levee to the shoreline of Six Mile Lake.

The sediments of the Teche-Mississippi River underlie the outer natural levee terrain. These sediments consist of grayish brown to olive gray sandy silt, silt, silt loam, silty clay, and clay. These deposits are over 8 m thick beneath the center of the outer natural levee. These sediments interfinger and pinch out within the fine-grained and organic-rich sediments of the adjacent marsh and swamps (Smith et al. 1986).

Middle Natural Levee Terrain

Within the project area, the middle natural levee forms a narrow 50 to 150 m wide strip between the inner bank of Bayou Teche and the outer levee terrain (Figure 7). The middle natural levee terrain is inset into and topographically lower than the adjacent outer natural levee terrain. The elevation of the middle natural levee terrain varies between the level of Bayou Teche and just over 2 m above sea level. This terrain consists of a very gently sloping surface associated with the Buxin-Portland-Perry soil association that laps onto the outer natural levee (Figure 4). A low and narrow, but distinct, natural levee ridge occurs sporadically on this surface along portions of Bayou Teche within the project area.

The reddish colored sediments of the Teche-Red River underlie the middle natural levee terrain. These sediments consist of strong brown, reddish brown to yellowish brown sandy silt, silt loam, silty clay, and clay. These deposits are over five m thick within the center of the abandoned channel of Teche-Red River course. Against the outer natural levee, the Teche-Red River sediments quickly thin and pinch out within the abandoned channel of the Teche-Mississippi course (Figure 4).

Spoil Land

Within the project area, the spoil land terrain consists of level strips of land covered by spoil dredged from Wax Lake Outlet and along the natural levees of Bayou Teche (Figure 7). Spoil land occurs along artificial levees of both Wax Lake Outlet and along the natural levees of Bayou Teche. U.S. Army Corps of Engineers' records indicate the sediment was excavated and moved with hydraulic dredges.

Wax Lake Outlet

Along the Wax Lake Outlet, the spoil land consists of a 100 m wide strip of flat, wooded land along the western side of and an 80 m wide strip of land on the eastern side of the artificial levee on the left descending bank of the Wax Lake Outlet (Figure 7). A low dike borders the west side of this spoil land. The spoil was dumped against this dike and eastward towards the borrow pits associated with the artificial levee. The area between the spoil land and Wax Lake Outlet lacks spoil, although the area has been disturbed by agricultural practices and by pipeline construction.

Auger tests indicate that the area is underlain by 1.8 to over 3 m of spoil. Within the Wax Lake Outlet area, the spoil consists predominantly of very pale brown, gray to brown and yellowish brown sand, silty sand, and silt loam. The sandy nature of the spoil derives from the thick point bar sands that are beneath the natural levee deposits and within this part of the project area (Figure 7).

Adjacent to Bayou Teche, the sandy spoil is mixed with clods of strong brown, to yellowish red clay, silty clay, and clay loam with scattered shells and fragments of metal. Exposures in the borrow areas situated north of the East Calumet Floodgate, indicate that these clods are concentrations of water-rolled mud pebbles and other heavy materials contained within the sandy spoil. These concentrations represent the lags of clay pebbles, shell, and other heavy materials that accumulated at the outfall of the hydraulic dredges. The yellowish red clay, silty clay, and clay loam is Teche-Red River alluvium dredged out of the Wax Lake Outlet adjacent to Bayou Teche.

Bayou Teche

Fieldwork along the left descending bank of Bayou Teche verified that spoil land occurs as a discontinuous strip of variable width. Between stations 25+00 and 97+00, the width of the spoil land varies between 123 m (405 ft) and 35 m (115 ft) from the north of the channel of Bayou Teche. East of station 115+00, the width varies from 29 m (96 ft) to 78 m (255 ft) from the edge of the channel. Similar spoil land also occurs along the right descending bank of Bayou Teche (U.S. Army Corp of Engineers 1964).

This spoil land is flat, wooded land and perennial swamp. Along the central and eastern sections of the right descending bank, the spoil land is completely submerged and covered by swamp. Within the western section of the study area, the inner 20 to 60 m of spoil land was completely or partially subaerially exposed. Where the land is dry, the spoil land is covered by woods and very thick underbrush.

The spoil land along Bayou Teche consists of dark grayish to strong brown (10YR 3/3, 10YR 4/1-4/3, to 10YR 4/6) silt, silt loam, and clayey silt. Minor proportions of the spoil consist of clay and silty clay and are brown to yellowish brown (10YR 5/3-5/6) in

color. Auger tests show spoil to be 30 to 50 cm thick along the edges and from 90 to over 150 cm thick near the center of the spoil land. Bricks, brick fragments, pieces of coal, rotted wood, unidentified metal fragments and clods of the underlying dark and strong brown (e.g., 7.5YR 4/4-4/6) clay and silty clay were found within the auger tests.

Natural Disturbance of Cultural Resources

As sea level rose during the Late Wisconsinan Stage and Early Holocene Epoch, the landward migration of the shoreface eroded the upper 5 to 10 m of the coastal plain. This erosion probably destroyed any archeological deposits situated on the uplands of the former coastal plain. Because the top of the fluvial sediments within the fill of the Mississippi River Valley occurs at depths greater than 10 m below the former coastal plain, archeological deposits buried within the fill of the Mississippi River Valley probably survived the erosion of the ravinement surface. Later Holocene deltaic sedimentation buried the ravinement surface and the surviving valley fill deposits 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. 1986b; Suter et al. 1987).

The sediment of the Maringouin and Teche delta complex can be expected to contain archeological deposits. Smith et al. (1986) indicate that the natural levee deposits of the distributary systems that form delta plains contain archeological deposits. In the case of the Maringouin delta complex, the formation of the ravinement surface that caps these sediments probably destroyed a significant proportion of the archeological deposits. Within the project area, the delta plain of the Teche delta complex was buried by the slow accretion of unnamed marsh and swamp deposits. As a result, any Archaic period archeological deposits that occur within the natural levee deposits probably are intact.

Anthropogenic Disturbance of Cultural Resources

In additional to natural processes, the project area has been disturbed severely by historic navigational and agricultural activities. Agricultural activities, such as sugar cane and rice cultivation, have modified extensively the surface of the outer and middle natural levees within the project area. In addition, channel improvements to Bayou Teche and the creation of Wax Lake Outlet have disturbed severely both the geomorphic surfaces and the underlying sediments of terrains within and adjacent to the study area.

Agricultural Disturbance

Agricultural activities no doubt disturbed archeological deposits on or within the surface of both the upper and middle natural levees. The primary disturbance results from the creation of furrows or "row middles" and from the rows on which the cane is grown. Both the rows and row middles are 15 cm across and have relief of 40 to 50 cm.

The rows are formed by cutting into the ground by 20 to 25 cm and by building up ridges 20 to 25 cm high. Disturbance also results from plowing. Plowing as deep as 60 cm is done to condition the soil by breaking up hardpans and by improving permeability (Lytle et al. 1959; Mr. Bob Williams, U.S. Department of Agriculture, Soil Conservation Service [USDA, SCS], personal communication 1984). Finally, the extensive network of drainage canals and ditches probably destroyed or damaged severely numerous cultural resources within the area.

Rice farming also impacted small portions of the project region. The degree of disturbance largely depends upon the method by which the rice field was terraced. In some fields, terraces are simply formed by the addition of levees. The levee is diced from a narrow strip immediately upslope of it. In addition, the surface of the ground is disturbed by repeated plowing 10 to 16 cm deep and by wheels of heavy machinery. Other rice fields are leveled manually or with machinery by a method called "water leveling." Dirt taken from the higher side of a leveled strip is used to fill in the lower areas until the entire strip is level. The "water leveling" method probably results in considerable lateral and vertical disturbance to archeological sites (Mr. Bob Williams, USDA SCS, personal communication 1984). Finally, the extensive network of drainage canals and ditches that rice farming requires for draining and flooding the fields probably destroyed or severely damaged any cultural resources immediately adjacent to the project area.

Navigational Disturbance

The construction of the Wax Lake Outlet impacted severely or destroyed the cultural resources situated within and adjacent to its path within the project area. First, the Wax Lake Outlet cuts through the natural levee deposits that border Bayou Teche thereby destroying cultural resources previously located on those surfaces. These sites include the Confederate redoubts, and any archeological deposits associated with them. Dredged materials, which were placed along the sides of the outlet during construction, buried areas under 1.5 to 3 m of spoil along a 175 to 225 m wide strip of land extending on either side of the existing artificial levee. Finally, the unconsolidated point bar sands that underlie the natural levee have made the sides of the Wax Lake Outlet within the project area susceptible to slumping. Thus, any cultural resource situated along the banks of the outlet continues to be at risk.

Wax Lake Outlet

The number of sites that the construction of the artificial levee along the Wax Lake Outlet impacted is not known. Obviously, the excavation of borrow pits for the fill of the levee embankment destroyed any archeological deposits or features formerly located there. However, the thick cover of spoil may have partially protected the underlying ground surface from the massive earth-moving and land-sculpturing that are part of the levee construction process.

Along Bayou Teche, navigational improvements probably caused less drastic impacts. Only a relatively thin layer of spoil covers the surface of the middle natural levee near Bayou Teche. However, dredging impacts to riverine cultural resources such as shipwrecks and some remains associated with the battle of Bisland would occur primarily within the channel.

Summary

The project area consists of an 8.8 km section of Bayou Teche which in the prehistoric past acted as a course of the Mississippi River and later as a course of the Red River. Initially, the Teche-Mississippi River established its course within the project areas as it built the Teche delta complex into the Gulf of Mexico between 6,000 to 3,500 years ago. During this time, the large (outer) natural levees that border Bayou Teche, aggraded as a result of overbank flooding and through crevasse formations. Around 3,500 years ago, a course change by the Teche-Mississippi River left the Red River flowing down Bayou Teche, and the outer natural levees became relict, inactive landforms. The Teche-Red River flowed down Bayou Teche between approximately 3,500 and 2,000 years ago. The Teche-Red River filled in the abandoned channel; discontinuous, low natural levees formed along its sides. After 2,000 years ago, the Teche-Red River abandoned Bayou Teche leaving its natural levee, the middle natural levee, as a relict landform. Since then, only pedogenic processes modified the geomorphology of the project area.

Within historic times, both agricultural and navigational activities altered significantly the geomorphology of the area. Rice and sugar cane farms disturbed the surficial sediments of natural levee deposits through deep plowing and the building of rice levees and sugar cane rows. The dredging of Wax Lake Outlet destroyed a segment of Bayou Teche, its natural levees, and cultural resources associated with them. Because of unstable banks, slumping threatens cultural resources situated along the banks of the Wax Lake Outlet. Within an area located near the outlet, a broad strip of the natural levee was buried by 1.5 to 3 m of spoil. Later, the construction of artificial levees destroyed cultural remains in the borrow areas. However, the thick spoil may have limited the disturbance of any surficial sites by the construction of the artificial levee. The dredging of Bayou Teche has had only a limited affect on historic cultural remains; affected resources were those located directly within the channel.

CHAPTER III

PREVIOUS INVESTIGATIONS

Previous Cultural Resource Studies Near the Project Area

Several archeological investigations have been undertaken within the vicinity of the project area. During his study of prehistoric archeological sites in coastal Louisiana, McIntire (1958) collected pottery from the surface of the Atchafalaya Basin site (16SMY10), a four-mound ceremonial center and burial site. The decorated sherds recovered included primarily Pontchartrain Check Stamped (41.4 per cent), and Fatherland Incised (14.7 per cent). Smaller quantities of Mazique Incised (9.3 per cent); Plaquemine Brushed (8.1 per cent); Coles Creek Incised (5.3 per cent); Tchefuncte Incised (5.3 per cent); Chevalier Stamped (4.0 per cent); and seven additional types, each comprising less than 3 per cent of the recovered assemblage, were recovered from the site. Based on his analysis of the pottery, McIntire identified Coles Creek and Plaquemine components (McIntire 1958).

During the early 1970s, Neuman (1977) conducted an archeological assessment of previously recorded archeological sites throughout the coastal region of Louisiana. This archival study, conducted for the National Park Service, was supplemented with limited field investigations at 65 selected sites. Field investigations included confirmation of site location, photographic recordation of each site, and limited surface collection. The study reviewed previous archeological studies conducted within the region, presented a brief chronological overview, and included a tabulated summary of prehistoric sites found throughout the coastal zone (Neuman 1977).

In 1975, Gibson (1975) conducted an archeological survey prior to planned channel maintenance for the U.S. Army Corps of Engineers, New Orleans District, along the Vermilion River, along Bayou Teche upstream from Wax Lake Outlet, and along Freshwater Bayou prior to planned channel maintenance. The survey included intensive bankline examination supplemented with pedestrian survey and shovel testing within high probability areas. Identified sites were surface collected and recorded. Thirty-eight archeological sites were located during the survey; not one was found in St. Mary Parish. Gibson concluded that most of the sites were distributed along terrace edges, ridges associated with ridge and swale landforms, and natural levees. A disproportionate number of natural levee sites were located at the mouths of tributaries; cutting banks appear to have been preferred settlement areas. Most sites were situated above annual flood levels, but in areas which did flood occasionally. Finally, most sites were located on silty loam soils (Gibson 1975:94).

Coastal Environments, Inc. (Gagliano et al. 1975) conducted a riverine survey along the Gulf Intracoastal Waterway in Louisiana for the U.S. Army Corps of Engineers, New

Orleans District, prior to planned maintenance dredging. Recorded sites and high probability areas were mapped prior to fieldwork; these areas were examined visually for cultural resources. Identified sites were surface collected to provide data for site assessments and interpretations, and all visited sites were recorded. A total of 192 sites were visited along 315.1 mi (507.1 km) of examined waterways; this included 150 prehistoric sites, and 42 historic sites. Gagliano et al. (1975) did not discuss each site recorded. Important St. Mary Parish sites included 16SMY19 and 16SMY130.

Neuman and Servello (1976) surveyed a portion of the Atchafalaya Basin for the U.S. Army Corps of Engineers to provide cultural resources data to guide planning of navigation and levee improvements. During the survey, previously recorded archeological sites were relocated, surface collected, and updated. In addition, selected probability areas were examined visually for cultural resources. Data pertaining to 133 sites were recorded, including data from 23 previously identified sites, 77 newly recorded sites, and 33 reported sites that could not be relocated during survey. Sites examined near the project area include 16SMY10, 16SMY18, 16SMY36, 16SMY37, 16SMY105, and 16SMY107.

Gibson (1982) also performed an archeological survey along the East and West Atchafalaya Basin Protection Levees prior to planned levee enlargement. The combined project corridors extended 295 km, from Moreauville to south of Morgan City. During survey, Gibson identified 33 prehistoric and historic archeological sites, 12 of which were evaluated as significant resources. Three sites are located near the current project area: 16SMY107, 16SMY163, and 16SMY166. Site 16SMY107 contains a Plaquemine component and a historic component dating from the early to mid 1800s. The Plaquemine component consists of a buried shell midden; the historic component consists of a network of canals, levees, and pumping stations. Site 16SMY163 also contains a Plaquemine affiliated shell midden. Site 16SMY166 contains remnants of a Confederate fort, Fort Bisland. Of these, Gibson (1982) evaluated 16SMY107 and 16SMY166 as potentially significant cultural resources.

R. Christopher Goodwin & Associates, Inc. (Goodwin and Jones 1986) surveyed the Wax Lake Outlet Control Weir corridor, near Six Mile Lake, in St. Mary and St. Martin Parishes, for the U.S. Army Corps of Engineers, New Orleans District, as part of the Wax Lake Outlet Control Weir, Atchafalaya Basin, Louisiana project. One archeological site, 16SMY37, was investigated during this survey. The site contained evidence of two or three ephemeral occupations, possibly affiliated with Coles Creek. Very little cultural material was present. The site lacked the quality of significance as defined by the National Register of Historic Places criteria.

In 1987, R. Christopher Goodwin & Associates, Inc. (Goodwin, Poplin et al. 1988) performed extensive historical research regarding the Battle of Bisland, and developed an archeological research design for testing cultural resources within the battlefield (16SMY166). Data collected included information about artifact distributions observed by

local collectors. The study, which did not include fieldwork, presented numerous recommendations for locating, testing, and evaluating battlefield features and artifacts. The current study includes implementation of a portion of that research design.

Previously Located Sites Near the Project Area

Several previously identified archeological sites are located near the project area (Table 1). One, the Atchafalaya Basin site (16SMY10), is a four-mound Coles Creek and Plaquemine ceremonial center and village situated at the confluence of Bayou Teche and the Lower Atchafalaya River. This well preserved site contains a considerable amount of cultural material. It is potentially eligible for listing on the National Register of Historical Places.

Five prehistoric shell middens also are recorded in the area. Six Mile Lake (16SMY36), a prehistoric shell midden, is located adjacent to the Lower Atchafalaya River. Site 16SMY37, a probable Coles Creek or Plaquemine shell midden, is situated south of Six Mile Lake. Henry Knight Place (16SMY107), Riverside Pass (16SMY163), and 16SMY105 consist of Plaquemine shell middens situated south of Riverside Pass. Henry Knight Place also has an antebellum plantation component.

According to the state site form, Bisland (16SMY166) contains archeological deposits on both sides of Bayou Teche that are associated with the Bisland battlefield. Much of the current project area is located within 16SMY166.

Site 16SMY18 is located along the east edge of the Wax Lake Outlet. Neuman and Servello (1976) recorded this destroyed site as a probable prehistoric mound, from which no artifacts were recovered; however, it probably is associated with Redoubt #2 of the Confederate defensive line at Bisland. Although 16SMY18 is named Moro Plantation, the site actually is located 5 mi from the historic Moro Plantation, and has no association with it.

Table 1

PREVIOUSLY RECORDED ARCHEOLOGICAL SITES NEAR THE PROJECT AREA[1]

Site No.	Site Name	Site Description	Location	NRHP Eligibility	Recorded By
16SMY10	Atchafalaya Basin	Coles Creek and Plaquemine four-mound ceremonial center with associated shell midden and prehistoric burials	Confluence of the Lower Atchafalaya River and Bayou Teche; T15S, R11E, Section 41	Potentially eligible	McIntire and Saucier 1952
16SMY18	(Moro Plantation)	While purported to be a prehistoric mound and shell midden adjacent to Wax Lake Outlet; this site probably was remains of Redoubt #2 of the Confederate defensive line at Bisland; destroyed by riverine cutting along the Wax Lake Outlet	Adjacent to Wax Lake Outlet; T15S, R11E, Section 55	Not eligible	LSU 1952
16SMY36	Six Mile Lake	Prehistoric shell midden	Adjacent to Lower Atchafalaya River; T15S, R11E, Section 13	Unknown	Peterson 1952
16SMY37		Coles Creek or Plaquemine shell midden	South of Sixmile Lake; T15S, R11E, Section 45	Not eligible	Peterson 1952; R. Christopher Goodwin & Associates, Inc. 1986

Site No.	Site Name	Site Description	Location	NRHP Eligibility	Recorded By
16SMY105		Plaquemine shell midden	South bank of Riverside Pass; T15S, R12E, Section 3	Unknown	Chaisson, Neuman, Murry, and Servello 1974
16SMY107	Henry Knight Place	Plaquemine shell midden; antebellum plantation remains, including building remains (pumping station?); and, drainage canals	South bank of Riverside Pass; T15S, R12E, Section 35	Potentially eligible	Chaisson, Murry, and Servello 1974
16SMY163	Riverside Pass	Plaquemine shell midden	South bank of Riverside Pass; T15S, R12E, Section 35	Not eligible	USL ca. 1980
16SMY166	Bisland	Civil War battlefield, including Confederate defensive works and Union troop positions	Both banks of Bayou Teche, from Wax Lake Outlet, eastward approximately two miles	Potentially eligible	USL ca. 1980s

' Data obtained from state site files, Louisiana Division of Archaeology, Department of Culture, Recreation and Tourism, Baton Rouge.

CHAPTER IV

PREHISTORIC SETTING

The project area lies within the Lower Mississippi Alluvial Valley and the larger Southeastern Culture Area of the United States (Muller 1983). In Louisiana, the project area is situated within Management Unit III, as defined by *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983). Three stages delineate Louisiana's cultural sequence: the Paleo-Indian, the Archaic, and the Neo-Indian. Based on the geomorphological development of the region, the Bayou Teche delta lobe formed 6,000 to 3,500 years ago. During its formation, the full flow of the Mississippi River passed through the Teche-Mississippi channel (Smith et al. 1986). Following the eastward diversion of the Mississippi River into the subsequent St. Bernard delta lobe, the Teche channel received transitory discharges of the Red River until about 2,000 years ago. These discharges resulted in the deposition of Teche Red River alluvium along much of the current project area. Therefore, the earliest anticipated sites in the area, with the exception of deeply buried sites, would date from the Poverty Point Culture.

Poverty Point Culture (1700 - 500 B.C.)

The Poverty Point culture is named after the type site (16WC5) located adjacent to Bayou Macon, in West Carroll Parish. At the time of its construction, Poverty Point was the largest earthworks in the Americas. The site consists of six segmented ridges, each 15 to 45 m wide, forming five sides of an octagon adjacent to the bayou. Several other Poverty Point mounds are scattered in the immediate area; the largest of these, Mound A, probably consists of an incomplete bird effigy. This site may have functioned as a regional ceremonial, political, and distributional center. The position of Poverty Point on Macon Ridge overlooking Bayou Macon has led some to suggest that the location of the site allowed the inhabitants to exploit, if not control, the flow of trade goods between other communities (Muller 1983; Neitzel and Perry 1977; Smith et al. 1983).

Little subsistence information has been obtained from the Poverty Point site itself. Specialization in the procurement of deer and fish continued from Late Archaic times. Gibson et al. (1978) suggest that redistribution, or the centralized collecting and reallocation of economic produce during Poverty Point times, represents an alternative to seasonal movement; in this manner, the need for food year round was met. Incipient horticulture may have focused on a variety of cultigens, including sunflower, marsh elder, various Amaranths, Chenopodia, and gourds and squash.

Poverty Point culture is characterized by baked clay balls, a microlithic stone tool industry, and extensive earthworks (Ford and Webb 1956; Webb 1968; Kuttruff 1975). Numerous clay balls ("Poverty Point objects") have been recovered from Poverty Point

sites. These balls probably served as cooking balls used to warm liquids; these objects appear to have been substitutes for stone, which was scarce in the lower Mississippi River Alluvial Valley. A microlithic tool industry also flourished at Poverty Point, utilizing lithic raw materials from Alabama, Arkansas, Tennessee, Ohio, Indiana, and Illinois. Poverty Point tools were essentially the same as those used during the Archaic: bifacial knives, choppers, drills, gravers, scrapers, spokeshaves, ground and polished implements, and large stemmed and notched projectile points (Ellis, Kent, Gary, Wells, Macon, Hale, Pontchartrain, Carrollton, Marshall, and Motley) (Smith et al. 1983). The widespread trade network also included steatite vessels originating in Georgia and North Carolina, and copper originating in Michigan. Poverty Point assemblages often include exotic materials, such as hematite, magnetite, and galena; and luxury items, such as beads, gorgets and plummets.

Poverty Point sites range in size from small hamlets to large ceremonial and activity centers. The size and reach of Poverty Point traits suggest a highly organized social and religious system. Luxury items may indicate the existence of an artisan class (Smith et al. 1983). Internal strife and a gradual breakdown of central authority may have led to the decline of Poverty Point culture around 500 B.C.

Two sites with possible Poverty Point components are located in the general project area vicinity. Little Doctors Bayou (16SMY102) is a buried *Rangia* and *Ostrea* shell midden, up to 2 m thick, located at the northeastern edge of the Belle Isle salt dome. It was located during canal dredging. Large quantities of bone, Poverty Point objects, and some Tchefuncte pottery were recovered along the banks of the canal. This potentially significant site has not been evaluated. The other site, Salevee (16SMY157), is situated along Bayou Sale, north of Gordy, Louisiana. In addition to a scattering of Coles Creek pottery, and some chert flakes, a possible Poverty Point object was recovered from the site. Additional testing is necessary to ascertain whether or not the site includes a Poverty Point component. The site has not been evaluated.

Tchefuncte Culture/Tchula Period (500 B.C.-A.D. 300)

The Tchefuncte culture presented the first widespread evidence for the prehistoric use of pottery in the region, although a Late Archaic-like hunting and gathering tradition and a Late Archaic-like tool inventory persisted (Neuman 1984; Smith et al. 1983). Expansive intra-regional trade networks may have broken down during this period; however, population increased as did interregional relationships.

Ceramics initially appeared in the Lower Mississippi Valley during the early Tchula period (Ford and Quimby 1945). Tchefuncte ceramics probably developed out of the Stallings Island and Orange complexes of the Georgia-Florida coast (Ford 1969). Tchefuncte ceramics included both plain and decorated wares of soft and chalky paste which were tempered with either sand or clay. Ceramic vessels exhibited flat bases or

foot supports. Punctations, fabric and cord impressions, narrow and wide line incisions, and simple rocker stamping decorations were common. Tchefuncte Plain, Tchefuncte Incised, Tchefuncte Stamped, Lake Borgne Incised, Orleans Punctated, and Tammany Punctated represent common soft paste ceramic types. Alexander Incised and Alexander Pinched exemplify sandy ware types (Toth 1977).

Several Late Archaic or Poverty Point projectile point types are found in association with Tchefuncte contexts: Gary, Ellis, Delhi, Motley, Pontchartrain, Macon, and Epps (Smith et al. 1983). Boatstones, mortars, grooved plummets, sandstone saws, bar weights, scrapers, and chipped celts complete the Tchefuncte assemblage. Bone ornaments, socketed antler points, bone awls, and fish hooks are associated with Tchefuncte components.

Tchefuncte sites include coastal middens or inland villages and hamlets; they are found throughout the coastal zones of Louisiana, Mississippi, Texas, and parts of Alabama. Settlements tend to be located near slack-water environments along slow, secondary streams that drain bottomlands, near floodplain lakes, or in littoral settings (Neuman 1984). Coastal sites seem best suited for exploiting a variety of fresh-water and brackish water resources, particularly the clam *Rangia cuneata* (Shenkel 1984). Inland sites probably were oriented toward exploiting terraces and floodplain habitats; inland inhabitants relied less on brackish water resources (Shenkel 1984).

Four regional phases represent Tchefuncte sites in Louisiana: Pontchartrain, Beau Mire, Lafayette, and Grand Lake. Pontchartrain phase sites are situated around the edges of Lake Maurepas and Lake Pontchartrain (Gagliano et al. 1979). Beau Mire phase sites represent late Tchula period sites located on Prairie terrace surfaces (Weinstein and Rivet 1978). The Lafayette phase is considered a transitional late Tchefuncte (inspired by Marksville) cultural manifestation in the vicinity of Lafayette, Louisiana (Toth 1977). This phase is characterized by conical mounds containing flexed and bundled burials which lack grave goods. Lafayette phase ceramic types included Tchefuncte Plain, Tchefuncte Incised, Lake Borgne Incised, and Tammany Punctated. Grand Lake phase sites represent coastal adaptations in the southwestern part of the state (Gagliano et al. 1979). Although the Lower Atchafalaya and Teche basins appear to be ideal settings, the Vermilion River seems to be the most heavily populated primary watercourse in the vicinity.

Two Tchefuncte sites are reported in the project area vicinity. The previously mentioned Little Doctors Bayou site (16SMY102), located at the edge of the Belle Isle salt dome, includes a quantity of Tchefuncte pottery. The other site, North Bend (16SMY132), is located on the Bayou Sale natural levee, adjacent to the Gulf Intracoastal Waterway. It consists of a shell midden which contains Tchefuncte-like pottery. The site has not been evaluated.

Marksville Culture (A.D. 100-A.D. 300)

Marksville culture represents a regional (Lower Mississippi Valley) cultural tradition and a hybrid manifestation of the earlier Hopewellian culture climax of the Midwest (Toth 1977). Burial practices and material goods indicate participation in the Hopewell Interaction Sphere (Struever 1964). Because of similarities between Marksville and Hopewell (e.g., mound construction, burial patterns, and ceramics), many archeologists suggested that Hopewellians relocated to the Marksville culture area (Muller 1983). Marksville culture signified a resurgence in inter-regional exchange of prestige items and an intensification of rituals associated with mortuary activities (Cantley et al. 1984).

Marksville and Hopewell ceramics share a variety of decorative motifs: cross-hatching, U-shaped incised lines, zoned, dentate rocker stamping, cord wrapped stick impressions, bisected circles, and stylized bird motifs (Smith et al. 1983). Distinctive Marksville traits include a chipped stone assemblage of knives, scrapers, and drills; groundstone atlatl weights, and plummets; bone awls and fish hooks; Gary projectile points; and, conical mounds with log tombs or platforms. Conical burial mounds and geometric earthworks, log tombs, and an abundance of grave goods accompanying interments, imply a fairly high level of social organization.

Maize probably diffused into the area, and probably was utilized first in the region by Marksville peoples (Walthall 1980). Maize and earlier domesticated plant varieties, particularly pioneer annuals and tropical cultigens such as squash and gourd, supplemented intensive riverine oriented subsistence pursuits (Struever and Vickery 1973).

Marksville settlements generally are located along natural levees of rivers and distributary channels and along floodplain lakes in the Mississippi River Valley. The majority of Marksville sites are found along the Mississippi escarpment of Macon Ridge (Smith et al. 1983; Neitzel and Perry 1977). Houses probably were fairly permanent, circular, and possibly earth covered.

Two Marksville phases are recognized throughout the Teche region. The Jefferson Island Phase represents an early Marksville manifestation; the Issaquena Phase represents a declining post-Marksville phase in the Teche and Vermilion areas (Gibson 1975). Issaquena probably derives from the Mulatto Bayou Phase of the Yazoo Basin (Greengo 1964). No Marksville sites have been identified along Bayou Teche near the project area.

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

Ford (1951) first described Troyville culture as a late Marksville-early Coles Creek manifestation. Ceramics and temple mound construction characterized this culture

(Gibson 1982; Gibson et al. 1978). Troyville culture emerged around A.D. 700; it was named for the now largely destroyed Troyville mound group (16CT7). Although Troyville and Coles Creek sometimes are viewed as two distinct periods, striking similarities and interconnections warrant their study as a single unit of Louisiana prehistory.

Two technological advances dating from early Troyville times radically altered prehistoric lifeways: maize agriculture and the bow and arrow (Smith et al. 1983). Also, the presence of temple mounds and large ceremonial structures implies the emergence of a priestly social class, which required a stable economic base (Smith et al. 1983).

The size and number of sites located in the area indicate that the population increased throughout coastal Louisiana during Troyville/Coles Creek times. Troyville/Coles Creek peoples reinhabited wetland zones that were exploited during earlier Tchefuncte times. However, subsistence pursuits differed; smaller mammals and larger aquatic reptiles and fish were exploited during Troyville/Coles Creek; possibly the bow and arrow led to a higher hunter success ratio during Troyville/Coles Creek times (Gibson et al. 1978). Troyville/Coles Creek peoples inhabited fresh, brackish, and salt water environments. Gathering mussels and clams, particularly *Rangia* sp., supplemented hunting and horticulture as means of subsistence. Sedentism and community autonomy accompanied the intensive exploitation of plants and slash and burn horticulture (Gibson et al. 1978).

Despite the regional differences between Troyville/Coles Creek subsistence and settlement patterns, certain ceramic styles were widespread. Coles Creek Incised, characteristic of this culture, exhibited a series of incised lines below the rim of the vessel, with a series of triangles impressed beneath. Other ceramic types consisted of Beldeau Incised, French Fork Incised, Mazique Incised, and Pontchartrain Check Stamped. Ceramic styles differed in popularity from region to region; for example, Pontchartrain Check Stamped proliferated in the coastal region (Gibson et al. 1978). Baytown ceramics spanned Marksville, Coles Creek, and subsequent periods (Phillips 1970). The number and variety of ceramics point to an increase in size and complexity of the culture:

> ...there is an increase in the absolute number of components and in the size of corresponding pottery assemblages assignable to the Middle Coles Creek period. This change probably reflects a population increase and a broader range of adaptations to the various settings in the region...(Fuller 1985).

Large flat-topped pyramidal mounds constructed around an open plaza characterized Coles Creek culture. These served as both building platforms for wattle and daub structures and as burial mounds. Villages consisting of circular houses were situated away from the ceremonial centers; this pattern signals a change in social,

political, or religious concepts. This horticultural subsistence base probably required compensatory adjustments in man-land relationships and in social and political institutions (Gibson et al. 1978).

The Whitehall, Bayou Cutler, and Bayou Ramos phases comprise Troyville/Coles Creek in southeast Louisiana. In addition, ceramics from the Belle River site and the Miller site, both located in St. Martin Parish, compare favorably with ceramics found at the Greenhouse site (16AV2) in Avoyelles Parish, near Marksville (Gagliano 1967). Problems with phase definitions for Coles Creek in the Atchafalaya area were discussed previously elsewhere (Goodwin, Yakubik et al. 1985).

Several Coles Creek sites are located near the project area. The Atchafalaya Basin site (16SMY10), a four-mound ceremonial center and shell midden located adjacent to the confluence of Bayou Teche and the Lower Atchafalaya River, is situated about 2000 ft southeast of the eastern end of the project area. Wetfoot Hammock (16SMY16) consists of a large shell midden located at the confluence of Shell Island Pass and a small unnamed bayou. Shell Island Point (16SMY25) is a Coles Creek and Plaquemine shell midden located along the Lower Atchafalaya River at Shell Island Pass. It was recorded in the early 1950s as a 30 m long, 5 m wide, and 2 m thick shell midden; subsequent erosion reportedly has destroyed most of the site. Possum Point (16SMY31) consists of a multicomponent shell midden located at the north end of Wax Lake. Cultural affiliation at the site includes the Bayou Cutler Phase of Coles Creek, and the Delta Natchezan Phase of the subsequent Mississippian Period. Recorded in 1952, its current condition is unknown. Site 16SMY37, a Coles Creek shell midden located near Six Mile Lake, is located 1 mi north of the project corridor. Finally, the previously mentioned Salevee site (16SMY157) contains a scatter of prehistoric artifacts, including Coles Creek pottery.

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

By A.D. 1100, Plaquemine culture emerged from Coles Creek in the Lower Mississippi Valley. Mississippian cultures from the Middle Mississippi Valley later intruded into the area with varying influence on the indigenous Plaquemine culture. Although they maintained a regional identity, Plaquemine groups maintained trade with other Mississippian groups. Except for a greater emphasis on agriculture, Plaquemine culture remained essentially the same as the previous Coles Creek culture. The type site, Medora (16WBR1), is located near Plaquemine, Louisiana (Quimby 1951).

Plaquemine peoples tempered ceramics with a variety of materials including shell. Although earlier techniques endured, brushing emerged as the dominant decorative technique. Engraving also became popular (Smith et al. 1983). Plaquemine Brushed, Harrison Bayou Incised, Hardy Incised, L'Eau Noire Incised, Manchac Incised, Mazique Incised, Leland Incised, and Evansville Punctate represent common Plaquemine culture ceramic types.

Natural levees and margins of alluvial valleys comprised favorite settlement locations. Settlements consisted of dispersed villages, or hamlets associated with local ceremonial centers. Rectangular houses were constructed of wattle and daub.

Several Plaquemine sites are located near the project area. The largest, the previously mentioned Atchafalaya Basin site (16SMY10), represents a ceremonial center that includes a Coles Creek component. Plaquemine shell middens include 16SMY105; Henry Knight Place (16SMY107), and Riverside Pass (16SMY163); all three are situated east of the project area, near Riverside Pass. The previously mentioned Shell Island Point (16SMY25) also is a shell midden with a Plaquemine component. Two Mississippian shell middens have been located in the area, including the previously mentioned Possum Point (16SMY31), and Belle Isle Lake (16SMY103). Belle Isle Lake site (16SMY103) is located at the southern edge of Belle Isle.

Historic Contact

After European contact, several tribes were reported in south Louisiana. Two tribes were prominent within the vicinity of the project area: the Chitimacha and the Attakapas. The Chitimacha lived around Bayou Teche, as well as in parts of the Atchafalaya Basin. The French drove the Chitimachas out of the Bayou Lafourche region in 1706, and they resettled in the vicinity of Charenton, Louisiana, along Bayou Teche. However, some argue that the Grand Lake area may represent the original Chitimacha homeland, where they developed out of a Coles Creek background. At least 13 Chitimacha villages were scattered along the Teche near the present-day Chitimacha reservation in Charenton (Goodwin, Yakubik et al. 1985).

The Attakapas inhabited much of southwest Louisiana, including the lower Vermilion River region. They possibly moved from present day Texas to take advantage of the abundant resources available in the lakes, lagoons, and streams of southwest Louisiana. By 1700, Attakapas villages were scattered from Bayou Teche to coastal Texas. With the encroachment of Europeans, the Attakapas population declined. As with other native Americans, diseases such as measles, smallpox, influenza, and common colds drastically reduced their population. By 1805, only 175 Attakapas remained in Louisiana.

Summary of Significant Themes

Significant themes relevant to the prehistory of the project area, and to Management Unit III, relate to adaptive responses of inhabitants to the availability of natural resources (Smith et al. 1983). Changing deltas, coastal subsidence, alluvial valleys, nearby uplands, and coastal marshes influenced the subsistence-settlement systems of groups residing in the area.

Models of Tchefuncte subsistence-settlement systems suggest that Tchefuncte sites should be represented extensively within Management Unit III. However, only about 8 per cent of all prehistoric sites recorded in Unit III contain Tchefuncte components. The demographic patterns of Tchefuncte cultures in and around the area demand further study, as does the transition from hunting-gathering to incipient horticulture and agriculture.

The research themes outlined above also pertain to Marksville manifestations. Marksville social organization, religion and ceremonialism, mound construction, and inter-areal relationships between main centers and peoples throughout coastal Louisiana and adjacent states also require further examination.

Developments regarding horticulture and agriculture remain a theme central to understanding of Troyville/Coles Creek culture. Other pertinent themes include the characterization of the subsistence system, with particular attention to functional variability between site types; and, the rise of temple mound ceremonialism in relation to changing social organization.

For Plaquemine culture, the relationship between Plaquemine and other Mississippian cultures of the Lower Mississippi River Valley must be assessed. Additionally, influences from Mesoamerica and the development of the Southern Cult should be examined. The role of salt mining also requires further study. A further understanding of these relationships should coincide with a more complete explanation of cultural evolution and development, thereby clarifying the area's culture history.

CHAPTER V

HISTORIC SETTING

Antebellum Period

Settlement Along Bayou Teche

During the colonial period, the project area was part of the sparsely settled Attakapas district, a name purportedly derived from the Choctaw word for man-eater. As the name suggests, the region was inhabited by not always friendly Native American tribes; few Louisiana colonists ventured into the area until Acadian migration began during the late French colonial regime. Further settlement occurred under Spanish rule, but at the time of the Louisiana Purchase, the region remained largely unoccupied.

The acquisition of Louisiana opened up the Attakapas district, and settlement within the region proceeded rapidly. Cheap land encouraged settlement; for example, one arpent of land sold for approximately $4.00 to $5.00 (Sitterson 1953:16). Furthermore, the soil was rich, and Bayou Teche provided a convenient means of transportation.

Describing the region to Americans unfamiliar with Louisiana, William Darby wrote:

> Nature has been more than usually beneficient to the Attacapas , the fertility of the land is excessive, and the facility of navigation is seldom exceeded. It demands comparatively but little from the hand of art, to complete the benefits of this favored spot (Darby 1816:73).

Since lands were not difficult to clear, farms could be transformed easily into plantations, and cotton farming soon gave way to sugar cane cultivation.

This transformation was facilitated by falling cotton prices (the Panic of 1819), and by domestic sugar tariffs (Tariff of 1816). In the Attakapas district, the shift to sugar cane cultivation advanced briskly. For example, in 1828, there were 99 sugar producers in Lafayette, St. Martin, and St. Mary parishes; by 1829, 162 were recorded in the three parishes (Degelos 1892:65-68). In St. Mary Parish, sugar production emerged as the predominant enterprise.

Before 1850, the majority of sugar planters in Louisiana were busy expanding and developing their holdings; using borrowed capital, they took up new lands and acquired plantations, slaves and equipment (Sitterson 1953:70). By the 1850s, however, the developmental phase was over. The sugar plantation regime had become firmly

established and dominated the economy of Louisiana's lower parishes. Below the Red River, the cultivation of cotton was, for the most part, replaced by the planting of cane.

Large plantations exercised significant economic influence on the sugar industry; they had an economic advantage over their smaller competitors because of the prohibitive cost of machinery. For example, during the antebellum period, there was no trend towards centrally located mills or refineries. Consequently, every sugar cane plantation had its own sugar house. Regardless of size, each sugar plantation had to be both factory and farm (Roland 1957:3). The capital outlay required for machinery made sugar production far more expensive than the production of cotton, and this situation gave the large planter with available capital an advantage over his less affluent competitors.

The recurring theme noted throughout the project area and for sugar culture in Louisiana, in general, was consolidation. Sugar cane cultivation required not only expensive machinery but also substantial cane planting. Large producers had an advantage, and consolidation almost inevitably occurred. The trend toward consolidation was temporarily halted by the Civil War, but afterwards it continued well into the twentieth century.

This trend can be seen throughout the project area. In 1837, when the land claim map was prepared, only Section 18 and Sections 45 through 48 were unclaimed. Confirmation for Sections 45 through 47 occurred in 1846; confirmation for Section 48 occurred in 1860. In the meantime, consolidation within the project vicinity began. For example, by 1860, Pinckney C. Bethel combined several small tracts into his upper and lower plantations. A portion of the project area is encompassed by Bethel's merger of Sections 51, 52, 54, and 55.

The decade of the 1850s was a period of prosperity in St. Mary Parish. For all but two years (1853 and 1856), St. Mary Parish produced more sugar than any parish in the state. In 1853, crops in St. Mary were affected adversely by repercussions of the severe freeze and snowfall of January 1852; a hurricane in August 1856 also disrupted sugar production in the parish (Broussard and Broussard 1955:11; De Grummond 1949:37, 43; Champomier 1857:v-vii).

Riverine Transportation

Throughout the antebellum period, riverine transportation formed the primary means of travel throughout the Attakapas district, including within the study area. Development of overland routes between the district and the Mississippi River was impeded by the numerous lakes and bayous which separated the two. While local traffic utilized a public road which aligned the west bank of Bayou Teche (Conrad 1979), travel and commerce over long distances was dependent on successful navigation of Bayou Teche.

During the early nineteenth century, Attakapas district commerce was focused on the production of beef, vegetable, and agricultural products, and on the distribution of these goods to New Orleans. Many of these goods required rapid transportation to prevent spoilage during shipment. In response to this transportation need, commercial vessel routes between the district, and the Mississippi River and New Orleans, were established beginning in the late 1810s. These routes, plied by steamers such as the *Louisianais*, the *Valcano*, and the *Louisville*, initially extended from the Teche, through the Atchafalaya Basin and Bayou Plaquemine, to the Mississippi River. However, low water levels generally made them impassible during the summer and fall months. A few vessels, such as the *Teche*, transported goods to New Orleans via the Gulf of Mexico. However, numerous snags along lower Bayou Teche hindered navigation, resulting in high operational costs. The early nineteenth commercial vessels typically transported cattle to market (Brasseaux 1979).

During the 1830s through 1860, numerous sugar plantations thrived along Bayou Teche. As stated previously, St. Mary Parish led the state in sugar production during most of the 1850s. Until late in the antebellum period, the bulk of commercial cargo, predominantly sugar, was transported to New Orleans via the Bayou Plaquemine route. This route was navigable during winter and spring, when the majority of sugar was processed and sent to market. However, the inland routes remained impassible during the low water months in summer and fall, so passengers and cargo continued to travel to New Orleans via the Gulf of Mexico during those months (Brasseaux 1979).

Riverine commerce and travel along Bayou Teche was spurred in 1857, with the completion of the New Orleans, Opelousas and Great Western Railroad Company between Algiers, which is situated across the Mississippi River from New Orleans, and Brashear City, now Morgan City. This 80 mi (129 km) long rail link with New Orleans permitted rapid, reliable transportation of passengers and cargo from the plantations along the Teche to New Orleans on a year-round basis. This resulted in a considerable increase in the volume of cargo carried by steamers along the Teche, through the project area, to Brashear City. The rail link proved so successful, that during the same year, 1857, 45 prominent St. Mary Parish planters and merchants petitioned the general assembly to erect a dam across Bayou Plaquemine to inhibit flooding (Brasseaux 1979; Millet 1983).

The Project Area on the Eve of The Civil War

On the eve of the Civil War, most of the planters in the project vicinity were prosperous and well established. The locations of the main plantations are depicted in Figure 8. The Civil War bought disruption and even death to the planters' families, disorder to their labor supply, and devastation to their homes, sugar houses, plantation outbuildings, bridges, and vessels. The locality was shortly to be both a campground and a battlefield for opposing armies.

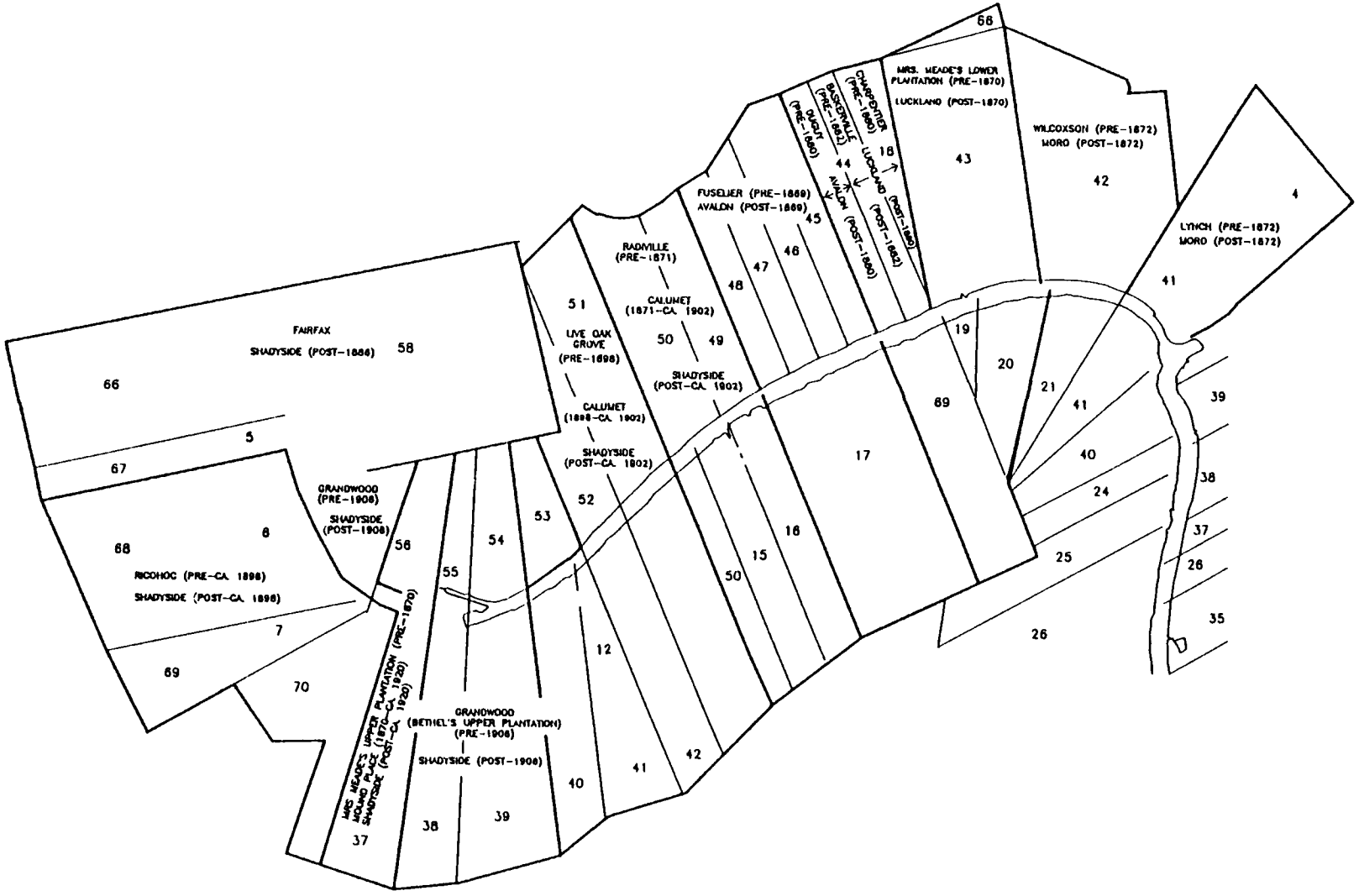


Figure 8. Location of plantations near the project area on the eve of the Civil War.

Most of the planters within the project vicinity converted from horse to steam powered sugar houses. By 1860, only 69 of the 170 mills in St. Mary Parish processed sugar in mills powered by horses (De Grummond 1949:44). The harvest was measured in hogsheads, although as the contemporary chronicler of the sugar crop, Champomier, noted: "It is well known that our planters do not make hogsheads of the same size, and there is a wide margin in some of them" (Champomier 1857:43). Nevertheless, he reckoned a hogshead to be 1,150 pounds of sugar.

The present project area includes a portion of Section 58, T15S, R11E, which in the 1850s was a swampy segment situated on the left descending bank of Fairfax Plantation. For most of the decade, the planting establishment was home for Judge Joshua Baker, a leading figure in the parish, community, and state. Ironically, Fairfax Plantation became a battlefield of the Civil War, despite the fact that Judge Baker was among the leading opponents of secession in Louisiana and never leant his support to the Confederacy. Baker was born in Kentucky in 1799, but moved with his parents in 1810 to St. Mary Parish. There, they settled on land which later became Oak Lawn Plantation. Senator Alexander Porter, the builder of Oak Lawn, took as his first wife Joshua Baker's sister (Conrad 1988).

Joshua Baker was educated at West Point, one of the few institutions of the time to offer courses in engineering. After graduation in 1819, he studied law at Litchfield, Connecticut, then the foremost training ground for the legal profession in America. Returning to Louisiana, he became an engineer and builder, as well as a member of the bar and a judge of St. Mary Parish. He constructed the St. Mary Parish courthouse in 1850, although some complained that his bid of $12,000.00 was too high (De Grummond 1949:56). He also served in the state senate and on the State Board of Public Works (Conrad 1988:31). Actively interested in the construction of bridges and railroads, Baker was a member of the original board of directors of the New Orleans, Opelousas, and Great Western Railroad. By the Civil War, the tracks of this railroad reached from New Orleans only as far as Brashear (now Morgan) City; however, the roadbed had been completed through the right bank of Judge Baker's property on the Bayou Teche (SP Bulletin 1952:16-17). A telegraph line also ran along the same path.

Judge Baker was an established sugar planter along the lower Teche. According to Champomier, the judge "suffered a good deal" from the severe winter of 1850-1851 (Champomier 1851:34). By 1854, however, Fairfax Plantation produced 495 hogsheads of sugar; in the following season, 510 were produced (Champomier 1854:34; 1855:32-33). Judge Baker's yield of more than 500 hogsheads of sugar per season put him in the top 25 per cent of the sugar producers in the state (Roland 1957:3).

After the hurricane of 1856, however, Fairfax Plantation produced only 37 hogsheads of sugar (Champomier 1857:32). Furthermore, Judge Baker's railroad interests were affected adversely by the Panic of 1857. Perhaps for these reasons, Baker sold Fairfax Plantation in 1858 for $112,000.00 to Dr. Thomas Bisland, a planter from

Concordia Parish. Included in the sale was Baker's steamboat, the *T.S. Archer*, and two flatboats (COB M, Folio 318, Act 9439 St. Mary Parish Courthouse).

Dr. Bisland, a Mississippian by birth, came from a planting family with widespread holdings in Louisiana. At 27 (1860), Bisland was married, the father of a baby girl, and owned 120 slaves; he had accumulated $90,000.00 in personal and $120,000.00 in real property (Menn 1964:380; Businelle 1986:62). By law, slaves were considered real rather than personal property, but census enumerators often did not observe this distinction. The enumerators also were careless about recording slave dwellings. Although the number of such structures was supposed to be entered, the 1860 census taker failed to record this statistic for the project area.

Dr. Bisland made a success of Fairfax Plantation before the Federal invasion of the Teche. Final production during the 1862 season was 565 hogsheads (Champomier 1862:32).

Situated directly below Fairfax Plantation on the right descending bank of Bayou Teche was Ricohoc Plantation, the establishment of William Taylor Palfrey. Palfrey and his seafaring family migrated from Massachusetts to Louisiana very early in the nineteenth century. His father established a sugar plantation, Forlorn Hope, on the banks of Bayou Teche near Opelousas, Louisiana. In spite of his father's wry sense of humor, William T. Palfrey prospered in Louisiana and was among the leading planters of St. Mary Parish. He served as sheriff, parish judge, state senator, and founder and cashier of a bank in Franklin (Edmunds 1979:27). Palfrey not only possessed 170 slaves of his own but he also maintained 147 slaves that belonged to his father's estate (Menn 1964:384). Among the heirs to Palfrey's estate was a brother, John Gorham Palfrey, who remained behind in Massachusetts, where he worked as editor of *North American Review*, a leading periodical of the time. J. G. Palfrey failed to mention to his Boston readers that he was part owner of a large slaveholding establishment located in the canefields of Louisiana (Phillips 1929:300).

Ricohoc Plantation is not part of the present project area. Nevertheless, William T. Palfrey's plantation diary is an important unpublished source of information for the lower Teche. Furthermore, there is a rare and unusual published source from Ricohoc Plantation. Ellen Betts, a former slave of Palfrey's, contributed her memories of slavery at Ricohoc to a Works Project Administration project (Botkin 1945:125-130). The importance of Palfrey's diary and Betts' reminiscences make them indispensable to discussion of the plantations of the lower bayou.

Below Ricohoc was the upper tract of the plantation of Mrs. David E. Meade, a young widow with one son. Mrs. Meade lived on the right descending bank of the bayou, but contemporary sugar reports indicate that cane planting at her upper tract was confined to the left bank in Section 56, T15S, R11E. A part of her holdings in Section 56 is included within the present project area.

Mrs. Meade was the youngest daughter of David Weeks, the builder of the handsome plantation house, Shadows on the Teche, in New Iberia. After the death of David Weeks, his widow married Judge John Moore, also a man of consequence in the Teche country. Harriet Meade, Allie to her family, was, at one time, a plantation belle much sought after because of her beauty and her dowry. She married Dr. David E. Meade of St. Louis, but he died in 1854 (Webb 1983:277-278). The young widow, 28-years-old at the time of her husband's death, was left in charge of a plantation. Reporting to her mother early in 1855, Allie Meade wrote:

> I would come up but it would be very inconvenient for me to leave home now. I have a great deal to attend to and still if I were to try I could not tell you what it was. It is time to commence a spring garden. Shipping sugar attending to my fowl getting tl.ings fixed on both places to commence another year, you know the overseers want ploughs axes...and many things which I have to buy. These and many other little household business keep me always employed. Things that would not be done right or perhaps not done at all if I were absent (Sitterson 1953:70-71).

Mrs. Meade had much in common with Judge Baker, Dr. Bisland, and Judge Palfrey. All were children of American settlers in Louisiana who arrived early and obtained capital to enter the sugar industry. This group of planters had long known, and married into, each other's families. Joshua Baker's daughter, for example, married Judge Palfrey's son, and Judge Baker built a handsome Greek Revival house for the couple. The house still stands in the town of Franklin (Lower Bayou Teche Tourist Commission 1986:6). Judge Palfrey's first wife was a member of the Conrad family, as was Mrs. Meade's mother. Furthermore, the Palfreys married their cousins of the Weeks family, thus providing another family tie between Judge Palfrey and Harriet Weeks Meade (Webb 1983:xvi, 277-278). Because of these extensive family connections, large sugar planters of American extraction appeared to have a unity which set them slightly apart from their neighbors in the lower parishes of Louisiana.

Mrs. Meade's planting interests were never so extensively developed as those of her family or her neighbors, but she did have an overseer who lived on the place (Businelle 1986:60). She also was the owner of 141 slaves, 75 at one tract and 66 at the other (Menn 1964:384). At her upper tract, she used horse rather than steam power for her sugar house, and the antebellum output never exceeded 100 hogsheads. Mrs. Meade's assumption of duties on the death of Dr. Meade had no adverse effect on production. She managed a slight increase in the output of the upper tract. During the planting season of the hurricane, however, Meade managed only six hogsheads (Champomier 1857:32).

A series of holdings stretched below Mrs. Meade's establishment. These were consolidated on both sides of the Teche by Pinckney C. Bethel, another sugar planter of American origin. Immediately downstream from Mrs. Meade's place in 1860 was Bethel's Grandwood, situated on both the left and right banks of Bayou Teche. This establishment was sometimes referred to as Bethel's upper plantation. The present project area includes a part of the left bank of Bethel's upper plantation (Sections 54 and 55, T15S, R11E).

The principal structures of Grandwood Plantation were located on the right descending bank in 1860, but a wooden bridge across the Teche connected the two segments of the plantation. This bridge was located within the project area near the center of Section 54, T15S, R11E.

Between Bethel's upper and lower holdings on the right bank of the Teche, but not within the project area, was Pecan Grove Plantation, which occupied a pie shaped wedge, Section 12, T15S, R11E. This holding is of interest because it operated a steam powered sugar house on the right descending bank of the Teche and almost directly across from the sugar house on Bethel's lower tract on the left bank of the Teche. The two sugar houses were depicted facing each other across the bayou on Jekyll's map of Bisland battlefield in 1863 (Figure 9). Pecan Grove Plantation was sometimes under Bethel's proprietorship and sometimes not. From 1857 to 1862, that tract was not under Bethel's supervision. Nevertheless, Pecan Grove Plantation provides the answer to why Pinckney C. Bethel is often credited with having three sugar houses during the invasion of the Teche. The first of Bethel's sugar houses was on the right bank at Grandwood (Bethel's upper plantation); the second of Bethel's sugar houses was on the left bank at Live Oak Grove (Bethel's lower plantation); the third sugar house was that of Pecan Grove Plantation, between Bethel's holdings on the right bank.

Bethel's lower holdings, which after 1858 he called Live Oak Grove Plantation, also extended along both banks of the bayou, but contemporary sugar accounts describe the planting operation as confined to the left bank. Also on the left bank of Live Oak Plantation was a steam powered sugar house which was destroyed during the Civil War (Champomier 1860:33). Until 1858, Bethel referred to this holding as Sawmill Plantation, and contemporary legal documents indicate that there was indeed an antebellum sawmill on this tract (COB M 13:628, Line 7774 St. Mary Parish Courthouse). The project area occupies a portion of Sections 51 and 52, T15S, R11E, on the left bank of Bethel's Live Oak Plantation.

Bethel was not listed in the 1860 census of either St. Mary Parish or Louisiana. He may have been the only absentee planter in the project vicinity. W. T. Palfrey's diary mentions that Bethel had a house "in town," presumably Franklin. Since the Pinckneys and Bethels were prominent planting families in South Carolina, Bethel may have been South Carolinian by birth. In 1839, he married Elizabeth Smith, the daughter of a sugar

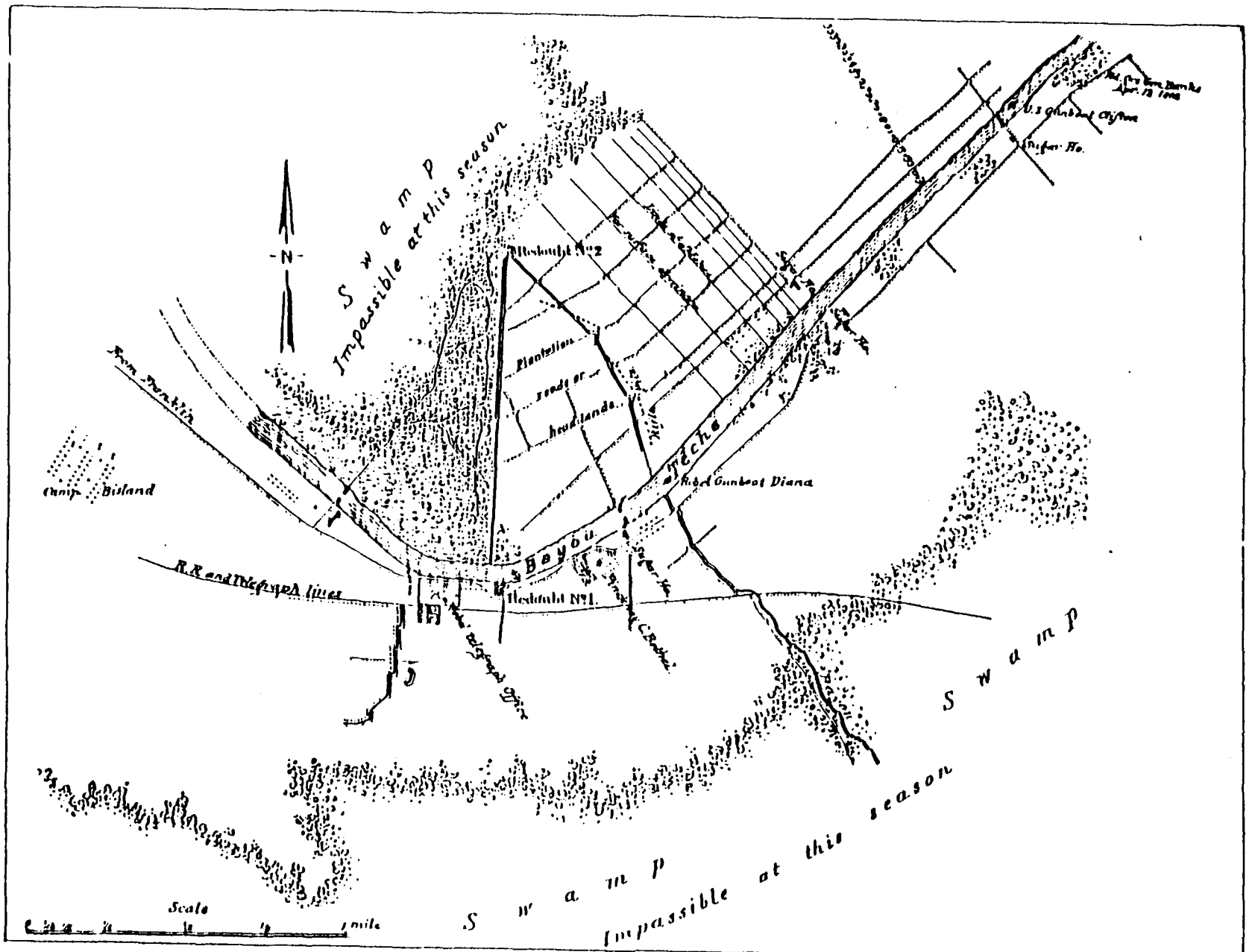


Figure 9. T. Jekyll's Map #16 (April 1863) showing the battlefield of Camp Bisland (Cartographic Division, National Archives, Records Group 77, Civil Works Maps File M112).

planter, in St. Mary Parish; part of his project area holdings originated from his wife's family (DAR 1931:5).

The combined operations of Bethel's upper and lower plantations made him by far the largest sugar producer in the project area. One student of the period estimated that Bethel and his 266 slaves were among the top 12 sugar producers in Louisiana in 1860 (Menn 1964:114, 380). His yields in 1854, 1855, and 1856 each exceeded 1000 hogsheads, and his productions of 1859 and 1862 were equally large (Champomier 1854:34; 1855:39; 1856:33; 1859:30; 1862:32-33). The hurricane of 1856 reduced his yield to 283 hogsheads (Champomier 1857:32).

Below the Bethel plantations were the holdings of two brothers, Octave and Numa Cornay. Known in the 1850s as Radiville Plantation, this establishment extended across Bayou Teche and included Sections 49 and 50, T15S, R11E. These sections encompass part of the project area on the left bank of the Cornay establishment. Cornay's bridge crossed the bayou near the lower margin of Sections 15 and 50, T15S, R11E.

Unlike the Bakers, Bislands, Palfreys, Meades, and Bethels, the Cornays were descended from French colonists of Louisiana, although the spelling of their surname was corrupted. The older brother, Octave Cornay, was 54-years-old in 1860 and had personal property worth $50,000.00 and real property of the same value. The younger brother, Numa, 50-years-old, had no listed property. He and his wife, who was 35-years-old, had numerous children. The brothers owned 140 slaves (Menn 1964:380). There also were many relatives of all ages who seemed to be living with the Cornays, including F. O. Cornay, a parish surveyor. In the household also was Ernest Haydie, a civil engineer, who was the only person in residence who could not read and write (Businelle 1986:34).

Production of sugar seemed to fluctuate erratically at Radiville Plantation during the antebellum era. At no time did the Cornays produce more than 500 hogsheads from their holdings. In the last season before their land was invaded, however, they produced their best crop of 455 hogsheads (Champomier 1862:33). Their smallest output occurred during the season of the hurricane when production dropped to 15 hogsheads (Champomier 1857:32).

Confined to the right bank of the Teche below Radiville and not included within the project area was the establishment of Mrs. A. M. Stanley, a 35-year-old North Carolina born widow with several very young children (Businelle 1986:64). Her plantation is mentioned simply because after the Civil War it was consolidated with the Fuselier holdings across the bayou to create Avalon Plantation. Furthermore, Mrs. Stanley's steam powered sugar house stood on the right bank of Bayou Teche directly opposite the Fuselier sugar house on the left bank. Rather than the sugar houses of Pecan Grove and Live Oak Grove, these sugar houses may represent the structures depicted in Jekyll's map of Bisland battlefield in 1863 (Figure 9).

Opposite Mrs. Stanley on the left bank of the Teche was the plantation of Alfred A. Fuselier, which occupied Sections [45?,] 46, 47, and 48, T15S, R11E. The part of the Fuselier plantation that fronted the bayou was within the project area. A 27-year-old with a wife and baby daughter, Fuselier was new to the project vicinity but not to St. Mary Parish. Of French origin, the Fuseliers were numerous, and could be found throughout the region. Better off financially than his immediate neighbors, in 1860, Fuselier owned 85 slaves (Menn 1964:382). He held personal property valued at $75,000.00 and real property of the same amount (Businelle 1986:65). He also owned a residence and a steam powered sugar house within the project area, and he produced annual yields from his holdings of 113, 63, and 218 hogsheads before invasion disrupted production (Champomier 1860:33; 1861:33; 1862:33).

Below the Fuselier Plantation on the left bank in 1860 was the establishment of the Baskervilles and the Duguys. These families planted together there and on land across the bayou. The project area occupies a part of Section [45?], T15S, R11E, on the left bank of this plantation.

William Baskerville was an elderly, Virginia-born planter who died before the invasion of the Teche. He and his wife, Josephine, had no children living with them. Nevertheless, they shared a household with Armand Duguy and his wife, both of whom were in their thirties, and who had six small children. Baskerville had personal and real property valued at $40,000.00 in each category. Duguy had no property listed. An overseer and a white carpenter also lived on the property (Businelle 1986:63). The plantation contained a steam powered sugar house, probably on the right bank; the output of this establishment was small, often less than 100 hogsheads. This plantation produced only 175 hogsheads in 1862 (Champomier 1862:33).

Below the Duguy and Baskerville plantation was the establishment of Joseph M. Charpentier. According to contemporary sugar reports, his planting was confined to the left bank, but the location of his steam powered sugar house is not apparent. This structure seems to have survived the Civil War more or less intact, but whether it was on the right or left bank of the bayou is unclear.

Born in Louisiana of French descent, Charpentier was 38-years-old in 1860 and held personal property valued at $2,000 and real property valued at $6,000.00. He had an overseer with personal property valued at $1,500.00, almost as much as that of the planter himself (Businelle 1986:45). Charpentier's family planted the same tract as early as the 1840s, but production was at a peak on the eve of the Civil War. His best year occurred just before the invasion in 1862, when 382 hogsheads of sugar were produced (Champomier 1862:33).

Below the Baskerville establishment on the left bank only was another tract owned by Mrs. David Meade. It occupied Section 43, T15S, R11E, and its bayou frontage included the present project area. Mrs. Meade's residence probably was located at her

upper tract. Nevertheless, on her lower left bank plantation a triangle of buildings was present that was depicted on the captured Confederate map of 1863 (Figure 10). At her upper tract, Mrs. Meade used horses to power her sugar house; on this downstream property, she had a steam powered mill within the project area. In 1869, Dr. H. N. Sanders was operating a brick sugar house at approximately the same site, but whether this was Mrs. Meade's antebellum mill or a new structure is not known.

Mrs. Meade's lower holdings were more profitable than her upper tracts. Her best yield also was the year the invasion began. In 1862, this left bank tract produced 330 hogsheads of sugar (Champomier 1862:33).

Encompassing both the right and left banks of Bayou Teche, the sugar plantation situated downstream from Meade's lower tract establishment was that of Thomas Wilcoxon. This plantation occupied Section 42, T15S, R11E, and included a part of the project area.

Born in Louisiana, Wilcoxon was 60-years-old in 1860 and had personal property valued at $50,000.00 and real property at $60,000.00 (Businelle 1986:63). According to the captured Confederate map of St. Mary Parish (Figure 10), Wilcoxon had structures on both sides of the bayou. His residence was probably on one side; his sugar house on the other. Both were destroyed during the Civil War.

Wilcoxon continued to use horse rather than steam power in his sugar house, and his output had always been minimal. For several years in the 1850s, he produced no sugar at all. Nevertheless, on the eve of invasion in 1862 he had by far his best harvest with 220 hogsheads (Champomier 1862:33).

In the 1850s, the plantation of Richard Lynch was at the junction of Bayou Teche with the Atchafalaya River. Lynch planted cane on both sides of the river rather than along the bayou. His establishment, sometimes known as Lynch's Point, occupied Section 41, T15S, R11E, a pie shaped wedge with its narrow point extending into the right bank of the bayou and encompassing the confluence of the Teche and the Atchafalaya. Part of the project area is included in this section. The captured Confederate map of 1863 (Figure 10), and Howell's map of 1870 (Figures 11 and 12), indicate that Lynch's steam powered sugar house was situated on the left bank of the bayou at the point where it joins the river.

A Virginian by birth, Lynch was 50-years-old in 1860 and had a much younger wife and four very young children. An overseer also lived on this plantation. Lynch's real estate was a valued at $75,000.00; his personal property was worth $70,000.00 (Businelle 1986:45). The yield of his plantation never exceeded 500 hogsheads. In 1862, he produced 249 hogsheads (L. Bouchereau 1862:33).

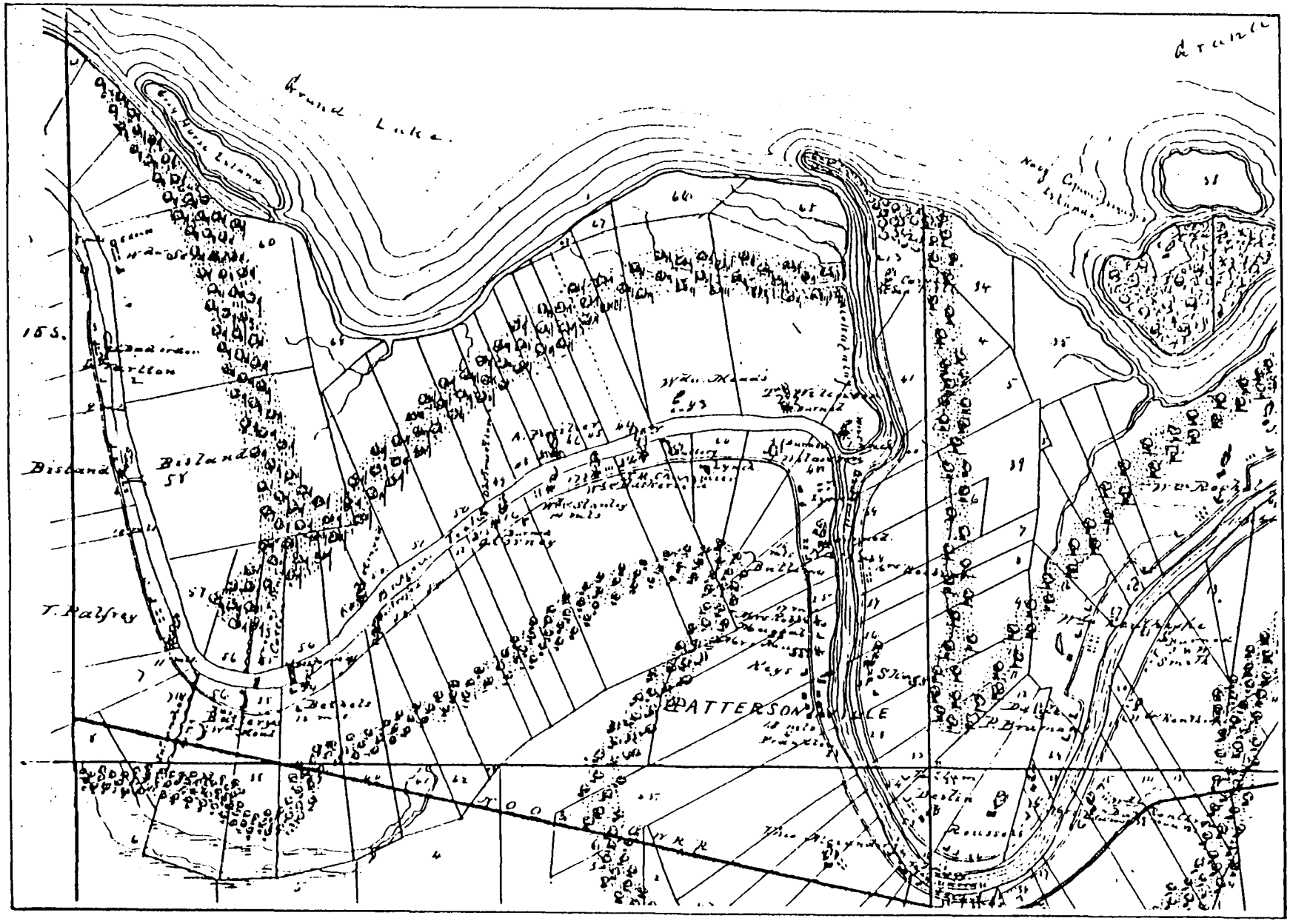


Figure 10. A captured Confederate map of St. Mary Parish (Cartographic Division, National Archives, Records Group 77, Civil Works Map File Z 33-113).

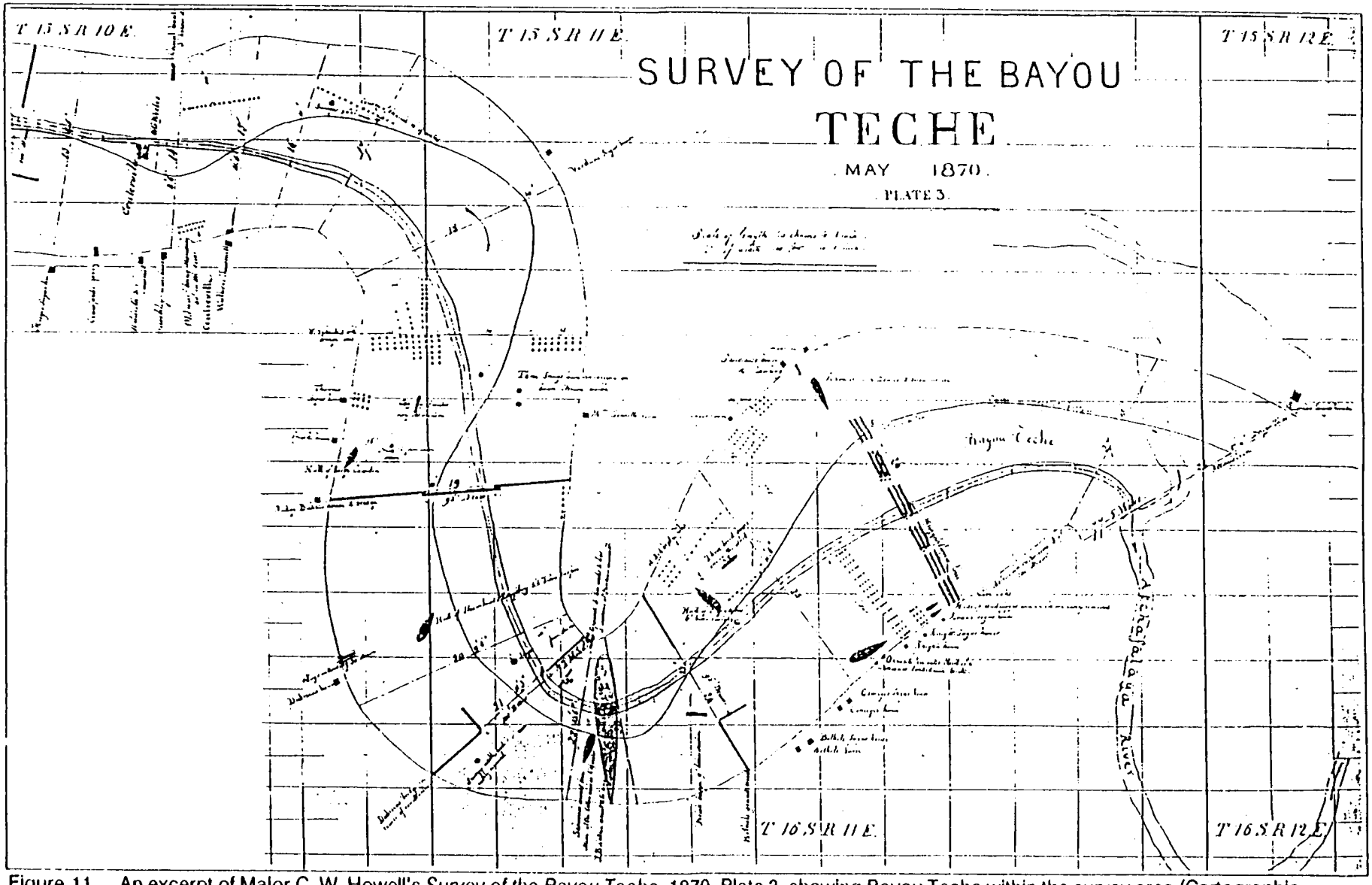


Figure 11. An excerpt of Major C. W. Howell's *Survey of the Bayou Teche*, 1870, Plate 3, showing Bayou Teche within the survey area (Cartographic Division, National Archives, Records Group 77, Civil Works Map File, M 137-1).

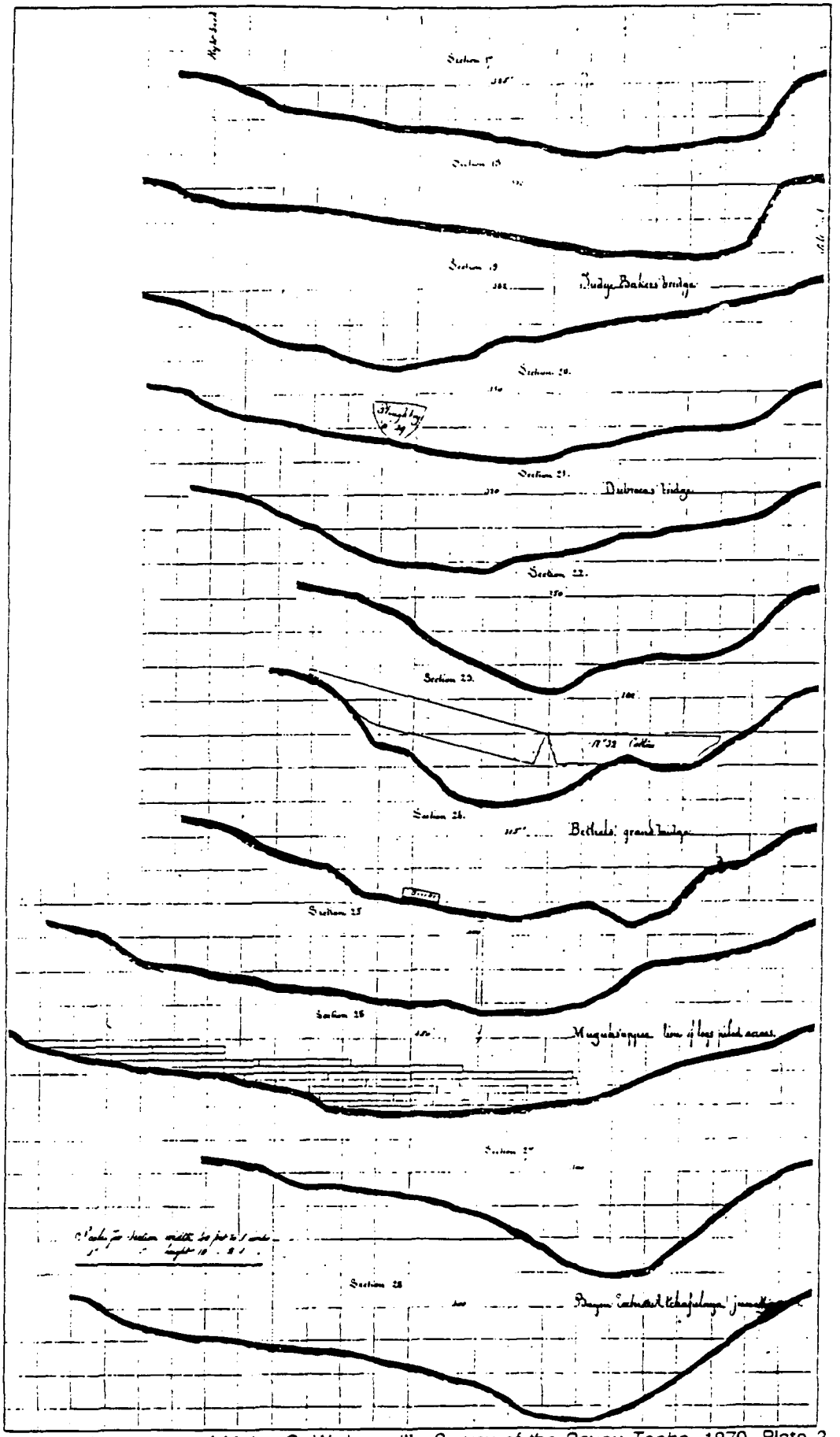


Figure 12. An excerpt of Major C. W. Howell's *Survey of the Bayou Teche*, 1870, Plate 3, showing Sections of Bayou Teche (Cartographic Division, National Archives, Records Group 77, Civil Works Map File, M 137-1).

To summarize the antebellum buildings identified in the project area, on the left bank on the eve of the invasion, structures present included: 1) a bridge across Bayou Teche at Bethel's upper plantation, Grandwood; 2) a sugar house at Bethel's lower plantation, Live Oak Grove; 3) a sawmill at Live Oak Grove; 4) Cornays bridge across the bayou at Radiville Plantation; 5) the residence of Alfred A. Fuselier; 6) the sugar house of Alfred Fuselier; 7) the sugar house of Mrs. Meade's lower tract; 8) a triangle of buildings at Mrs. Meade's lower tract; 9) a large structure belonging to Thomas Wilcoxon, either his residence or a sugar house; and, 10) the sugar house of Richard Lynch. The sugar house of Joseph Charpentier probably was situated on the left bank since his planting was confined to that area.

The Project Area During The Civil War

During the Civil War, several important events occurred along Bayou Teche. During the spring of 1862, Union forces occupied Brashear City, terminating the distribution of goods by rail to markets on the Mississippi River. The Confederate army fortified Bayou Teche in order to protect the salt mines at Petite Anse Island (now Avery Island). These defenses included the earthworks at Fort Bisland, and the placement of obstructions in the Teche downriver from the fort. The obstructions included the steamer *Flycatcher* and a schooner loaded with bricks, both of which were sunk crossways in the channel. In addition, numerous live oak trees were placed in the channel to impede navigation of Bayou Teche by Union vessels. Finally, navigational aids were removed from along the Atchafalaya River and Bayou Teche to hinder the navigation of these waterways by the Union Navy (Raphael 1975:55-56; Wells 1979).

In November 1862, four Federal gunboats attempted to ascend Bayou Teche to destroy the Petite Anse salt works. However, they were stopped at Bisland by the Confederate battleship *Cotton*. Following two days of naval engagement, the temporarily defeated Union vessels retreated down the Teche to Brashear City (now Morgan City).

In January 1863, four Federal gunboats, this time accompanied on land by seven infantry regiments, artillery, and cavalry, ascended the Teche, and engaged Confederate troops and the *Cotton* just downstream from Fort Bisland, near Cornay's Bridge. Following an indecisive battle on January 13, some of the Union troops, the 8th Vermont, retreated to a sugar house, probably Bethel's lower sugar house on the east bank. That evening, the regiment set a long line of campfires between the sugar house and the swampy edge of the lake to the north, giving the Confederates the impression numerous Union troop reinforcements had arrived. Later that evening, the Confederates burned their ship *Cotton*, and scuttled it crossways in the bayou to form an additional obstruction. Having achieved their objective of destroying the *Cotton*, the Union forces retreated downriver to Brashear City. During the engagement, the houses of P. C. Bethel, A. A. Fuselier, and Numa Cornay were destroyed (Raphael 1975:67-72; Goodwin, Poplin et al. 1988:38-39).

The Battle of Bisland occurred April 12-13, 1863. Union land and naval forces under Maj. Gen. Banks ascended the Teche, and engaged Confederate naval forces, and the entrenched Confederate troops, under Maj. Gen. Taylor. The battle, which is discussed extensively elsewhere (Goodwin, Poplin et al. 1988), delayed the Union advance up the Teche, and prevented the effective strangling of the Confederate garrison at Port Hudson, and the severing of Confederate supply lines along the Red River.

The project area was reoccupied during the summer of 1863 by Confederate troops, who refortified at Camp Bisland. In September, they withdrew in front of the advancing Federal army, who recaptured Franklin, Louisiana. By April 1864, the Union troops withdrew to Brashear City. No additional campaigns were conducted by the Federals to recapture the Teche (Goodwin, Poplin et al. 1988).

The Civil War engagements and troop movements had a profound impact on the land and land usage within the project area by changing the physical features of the plantations, disrupting their operations, and impoverishing the planters of the area. The uppermost tract in the project area was Fairfax Plantation, which Dr. Thomas Bisland had acquired from Judge Joshua Baker in 1858 (Figure 8). A noteworthy event took place at Fairfax Plantation on February 11, 1861, shortly after the secession of Louisiana. Dr. Bisland's wife, the former Margaret Brownson, gave birth to a daughter, Elizabeth Bisland. This little girl was to become a nineteenth century reporter, editor, feminist, and advocate of the cause of the working woman, first in New Orleans and then in New York City. Later in life she wrote a novel, *A Candle of Understanding*, about her childhood at Fairfax Plantation (Conrad 1988:73-74; Hansen 1941:389-390). Her father served as a surgeon with the Confederates at Vicksburg. He was captured and then paroled there on July 4, 1863 (Booth 1984:195). In the meantime, Mrs. Bisland and her children took refuge at Natchez. In her autobiographical novel, Elizabeth Bisland described the family's return to Fairfax Plantation after the fighting ceased, and gives a vivid description of the depredations of both the Confederate defenders and the Federal invaders (Wetmore 1902:28-30).

Dr. Bisland's planting operation was ruined by the war. He found that he could not complete payment to Joshua Baker for Fairfax Plantation "...in consequence of the general exhausted condition of the country...." Therefore, the doctor had to retrocede Fairfax Plantation to the judge in 1865 at the conclusion of the conflict. A clause in the retrocession gave to Joshua Baker "all rights that he may have against the United States Government as compensation for property taken, used, destroyed or emancipated and which was formerly attached to and connected with the said Fairfax Plantation..." (COB O, Folio 659, Act 10905 St. Mary Parish Court House).

Judge Baker obviously intended to make a claim against the Federal government for the destruction at Fairfax Plantation on the basis of his loyalty to the Union in the armed conflict. A strong opponent of secession in Louisiana, he refused to lend support to the Confederacy and simply sat out the Civil War. After much of Louisiana fell to

Federal troops, he was elected to Congress in November 1863 by that portion of Louisiana that was restored to the Union. Nevertheless, the radicals in Congress refused to seat the delegation from restored Louisiana, many of whom like Judge Baker were planters and slaveholders. When Fairfax Plantation was retroceded to him in 1865, Baker was living in Terrebonne Parish. On his return to Fairfax, he received an appointment from General Winfield Scott Hancock to be military governor of Louisiana. Baker served as governor from January to July, 1868 (Conrad 1988:31).

Although he lived just outside the project area, William T. Palfrey of Ricohoc Plantation provides exact data on the financial loss experienced by the planters of the region during the Civil War. Just before the invasion of the Teche, Palfrey listed his total assets at $243,596.24, and his liabilities at $12,691.19. At the conclusion of the war in October 1865, he listed his total assets at $114,532.85, less than half of his holdings before the invasion. His antebellum investment in slaves, $46,043.00, was eradicated, and the value he placed on Ricohoc plantation was reduced from $85,208.83 to $36,058.83 (Sitterson 1953:206-207).

Palfrey's diary also states that the Confederate bivouac, Camp Bisland, was actually on Palfrey's property rather than on Dr. Bisland's. Furthermore, Palfrey complained that the Confederate defenders committed almost as many depredations as the Federal invaders (Roland 1957:70-71).

Palfrey's diary also effectively sums up the effect of the conflict on the project area. In March 1864, he wrote:

> Our beautiful Parish is laid waste & is likely to become a desert - Plantations abandoned fences & buildings destroyed, mules, horses & cattle driven off by the federals, the negroes conscripted into the army or wandering about without employment or support, & stealing for a living - Those who remain are insolent & refractory, and in the domestic family arrangements the few who continue with their owners are more trouble...than they are of use....There can be no crop made in the country and of course starvation will be the dreadful consequence. All this is fearful to consider, and if indiscriminate plunder & massacre do not supervene we may be considered lucky - The Lord help us - such is war, civil war (Sitterson 1953:214).

Exact details of the losses experienced by other planters in the project area are difficult to obtain. An important source of information about the physical damage to the vicinity can be acquired from a captured Confederate map of St. Mary Parish (Figure 10). A partial list of structures destroyed in the conflict would include a sugar house destroyed at Mrs. Meade's upper tract; Pinckney C. Bethel's residence at Grandwood on the right bank, his bridge across the Teche, and his sugar house at Live Oak Grove in the project

area; the Cornay family's dwelling and sugar house, both on the right bank, and their bridge across the Teche; Alfred Fuselier's residence in the project area; Mrs. Stanley's sugar house on the right bank; Thomas Wilcoxon's house and sugar house, one of which was in the project area; and Richard Lynch's sugar house on the left bank of the bayou on a point where it joins the Atchafalaya.

Born into slavery on Ricohoc Plantation, Ellen Betts left a vivid account of the Civil War. Her descriptions are sometimes extravagant, but many of the facts of her narrative can be confirmed in her former master's diary. She wrote:

> Then first thing you know the Yanks and the Democrats 'gun to fight right there. They a high old mountain front Marse's house, and the Yanks 'gun pepper cannon ball down from the top that hill. The war met right there, and them Yanks and Democrats fit for twenty-four hours straight running (Botkin 1945:128).

There was not, of course, a "high old mountain" in the project vicinity, and she probably was trying to describe an Indian mound that became involved in the conflict. Mrs. Meade's upper tract, just below Ricohoc, was known as Mound Place after the Civil War.

Some of the soldiers who fell in the fighting on the Teche were buried on Mrs. Meade's upper and lower tracts, on Pinckney C. Bethel's plantation, and at the Cornay tract. In 1868, those soldiers whose graves could be identified were reinterred at Chalmette National Cemetery (Edmonds 1979:416).

The Project Area, 1869-1880

Reconstruction along Bayou Teche

Besides repairing the physical damage to their holdings and recouping the financial losses of property, including slave property, planters who wished to resume operations of sugar plantations had to deal for the first time with a labor supply that was not enslaved. Before labor could be hired, many obstacles had to be overcome, not least of which was the complete lack of trust exhibited on both sides in the bargaining. Nevertheless, by 1869 planters in St. Mary Parish were hiring workers at $15.00 to $20.00 a month for first class hands, with cabin, rations, and wood included in the bargain (Sitterson 1953:244). As might be expected, the cabins, originally slave quarters, were insubstantial structures. William T. Palfrey had a carpenter build some at Ricohoc in the 1850s for $25.00 each (Sitterson 1953:67).

The political situation in occupied Louisiana was unstable, and this was particularly true in St. Mary Parish, where newly enfranchised blacks outnumbered whites three to one. At the first parish election in 1868, a sheriff and a parish judge were elected. Both were black and both subsequently were murdered (Broussard and Broussard 1955:17).

In 1869, when Bouchereau resumed the chronicle of the sugar crops which Champomier had written in the antebellum period, only four plantations were operating in the project vicinity: Fairfax, Grandwood, the Cornay's Radiville, and Joseph Charpentier's former property, then under the proprietorship of Dr. H. N. Sanders (Figure 8).

Judge Baker, who for the first six months of 1868 was governor of Louisiana, had resumed planting on both the right and left banks of Fairfax Plantation. He was using steam trains and open pans in his sugar house, which was constructed of brick with a slate roof. The last recorded production at Fairfax Plantation, under Dr. Bisland's ownership in 1862, had been 565 hogsheads. Judge Baker's yield of 1869 was 205 hogsheads of sugar (L. Bouchereau 1869:42). After financial reverses, Judge Baker in 1874 gave up Fairfax Plantation. He became state engineer in 1875 and afterward retired to live with his daughter in Connecticut (Conrad 1988:31). A succession of proprietors assumed planting at Fairfax Plantation, but no major changes in the operation of the plantation occurred before 1880.

Mrs. Meade's upper tract was especially slow in resuming planting after the Civil War, during which her sugar house had been destroyed. Before the war, Mrs. Meade had planted her upper tract on the left bank only. After the war, her upper tract was worked on the right bank only, outside the project area. Under a new proprietor, who named the plantation Mound Place, some cane was harvested in 1871, but not until 1876 was a new wooden sugar house built. It used steam and kettles (L. Bouchereau 1877:76). Subsequent operations at the plantation can be briefly summarized. It remained independent if not prosperous for many years. In the 1890s, Mound Place abandoned sugar manufacture and became a cane plantation only. By 1920, it had become part of the Shadyside Company.

In 1869, Grandwood Plantation (Bethel's upper plantation) was once again operating on both the right and left banks of the Teche. Steam and kettles were used in the sugar house, which was constructed of brick with a shingle roof. It was on the right bank of the Teche. Grandwood Plantation's yield of 1862 had been 480 hogsheads. The output of 1869 was 367 hogsheads (L. Bouchereau 1869:42). By 1870, Pinckney C. Bethel also had resumed operations at his lower tract, Live Oak Grove Plantation. He did not rebuild his destroyed sugar house at the lower plantation but continued to use his brick sugar house at Grandwood. Both Grandwood and Live Oak Grove passed from his proprietorship in the late 1870s, but no major changes in the operation of the plantations took place by 1880.

Below Bethel's establishment was the plantation of the Cornay family, who spelled their surname very erratically. Bouchereau listed them as Cornet. Whatever the spelling, this family also once again was planting on both banks of the bayou by 1869, but they had abandoned sugar for rice. Their sugar house and their residence had been destroyed in the Civil War. Using horse power in their wooden rice mill, they produced 60 barrels of rice in 1869 (L. Bouchereau 1869:42). In the next season, the Cornays resumed sugar production on the left bank and replaced their wooden rice mill on the right bank with a brick, shingle-roofed mill.

In 1871, Daniel Thompson, a successful businessman from Chicago, acquired Radiville Plantation from the Cornays and renamed it Calumet. Thompson immediately converted the mill from steam and kettles to the use of steam and open pans, and by 1880, he had adapted the same structure to the use of steam kettles, vacuum pans, and centrifugals (L. Bouchereau 1871:54; 1872:52; A. Bouchereau 1881:18).

Known in the postbellum era as Avalon Plantation, the Fuselier establishment on the left bank also was slow to recover from the war. Fuselier's dwelling had been destroyed in the conflict, and planting did not resume until 1869, when Pinckney C. Bethel tried operating the tract. At that time, there was a wooden sugar house which used steam and kettles (L. Bouchereau 1870:67). This structure is depicted on the left bank of the Teche in Howell's chart of 1870 (Figures 11 and 12). The following year, the property was acquired by Joseph H. Acklen, a rich young Tennessee Unionist who had sat out the Civil War. Acklen consolidated his holdings on the Teche and acquired the former property of the Widow Stanley on the right bank and the holdings of Duguy on the left bank. Since neither of these tracts had a postbellum sugar house, Acklen used the Fuselier sugar house in the project area without modification. He made no agricultural innovations on the plantation, but he was an important figure in the politics of Reconstruction in Louisiana. As a Democrat, he successfully contested the Republican candidate for Congress in 1878 and won a seat in the House of Representatives. At that time, he gave up his planting operations in the project area (Conrad 1988:4). Successive owners modified the sugar house apparatus at Avalon, but they used the same wooden structure for many years to come.

After the Civil War, Dr. Henry J. Sanders acquired Mrs. Meade's lower plantation on the left bank and began operations there in 1870. Although his name is incorrectly spelled "Saunders," his house is shown on the left bank in Howell's chart of that year (Figure 11). At that time, he had a brick, slate roofed sugar house which is depicted in Howell's chart downstream on the left bank from Sanders' dwelling. Sanders named his holdings Luckland Plantation (Figure 13). By 1880, he had absorbed Joseph Charpentier's antebellum holdings into Luckland.

Thomas Wilcoxon's place, the next downstream and on the left and right banks of the bayou, was slow to recuperate from the Civil War. Wilcoxon's dwelling and his sugar house were destroyed during the conflict. Nevertheless, Wilcoxon built a wooden, horse

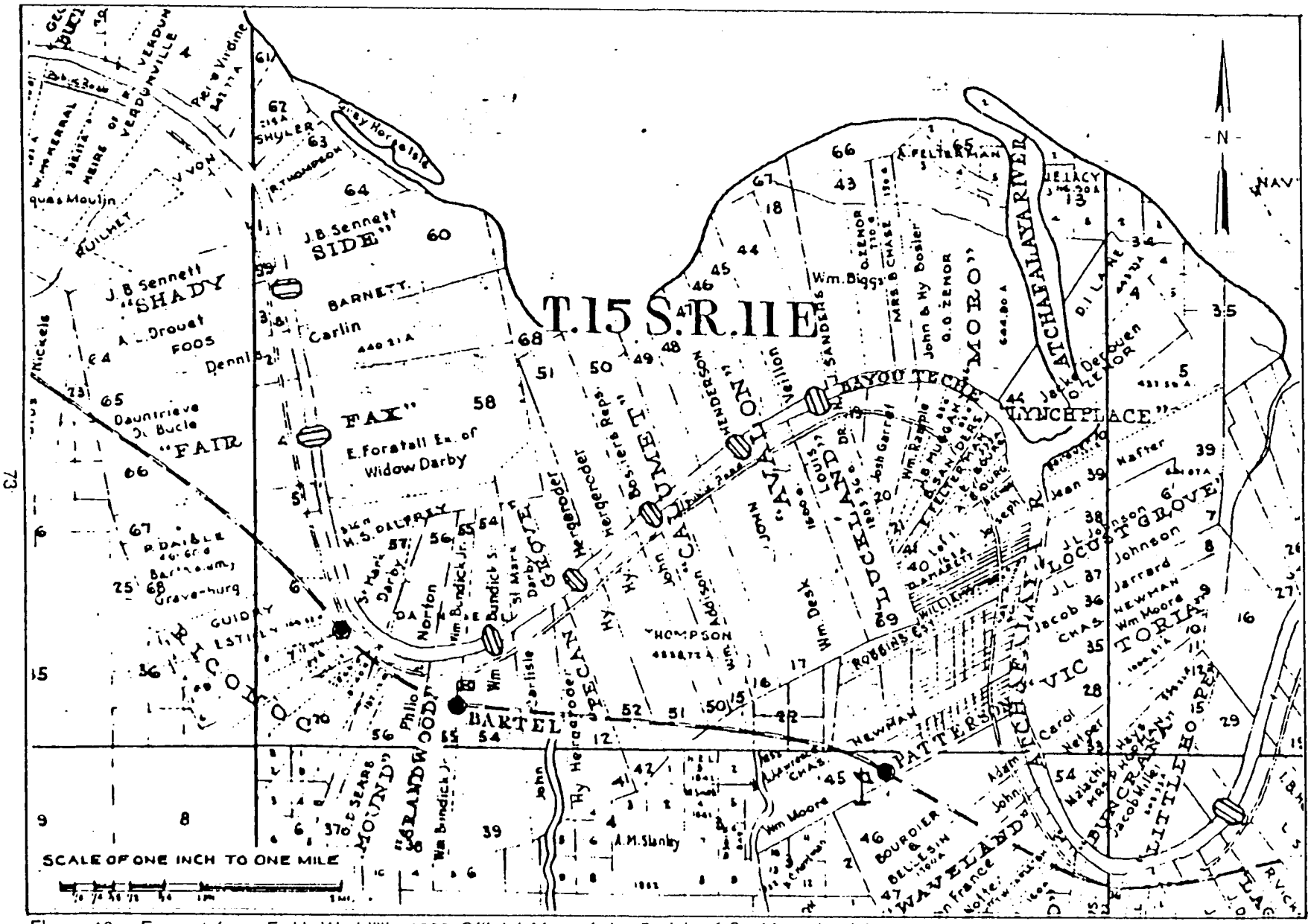


Figure 13. Excerpt from F. H. Waddill's 1893 *Official Map of the Parish of St. Mary, Louisiana and Portions of Adjoining Parishes*, showing postbellum plantations along Bayou Teche (National Archives, Cartographic Division, Washington, D.C.).

powered sugar house and he was able to produce 93 hogsheads of sugar in 1871 (L. Bouchereau 1871:54). In 1872, G. G. Zenor acquired the Wilcoxon place, converted the wooden mill from horse to steam power, and renamed the tract Moro Plantation.

The Zenor family had an important influence on the project area after the Civil War. They originally were from Kentucky but migrated to the Natchez region, where G. G. Zenor was born and finished high school. After helping his father plant in Concordia Parish, Louisiana, Zenor moved in 1868 to St. Mary Parish, his wife's home. The couple had three sons: Webb, Oscar, and George (Perrin 1891:388). Oscar in particular was to become a leading planter and sugar manufacturer in the project vicinity, and Moro Plantation was to be the nucleus of the family's expanding operations for many years to come.

The plantation of Richard Lynch was the point where the bayou joins the Atchafalaya. It also was slow to recover from the Civil War. His sugar house had been destroyed. Lynch died soon after the war, but his heirs rebuilt the wooden sugar house in 1870, in approximately the same location. It is shown in Howell's chart of that year (Figure 11). Nevertheless, the Lynch heirs produced only 26 hogsheads in their first postwar endeavor of 1871, and 18 hogsheads in 1872, as compared to 349 in the invasion year (L. Bouchereau 1871:54; 1872:52)). In consequence, the heirs in 1872 sold their plantation to the Zenor family, who incorporated Lynch's Point into their newly created Moro Plantation. In 1873, the rebuilt sugar house at Wilcoxon's former holdings, the upper part of Moro Plantation, again was destroyed (L. Bouchereau 1874:70). The Zenors, therefore, used the Lynch sugar house at the lower tract of Moro Plantation until 1880. Thereafter, they transferred sugar production to River Side, a Zenor family holding outside the project area on the river below Patterson.

Navigation of Bayou Teche

Following the Civil War, plantations along the Teche slowly recovered, and regular commercial utilization of the river resumed. Steamers, packet boats, and barges plied the bayou transporting passengers and cargo between the Attakapas region and the railroad at Brashear City. Obstructions placed in the bayou during the Civil War, along with remains of destroyed wharves and bridges, and accumulation of debris such as live oak trees, continued to inhibit navigation, damaging and sinking many vessels.

Captain E. B. Trinidad, of the U.S. Mail steamer *Warren Bell*, was so concerned about the safety of the Teche waterway that in 1868 he prepared a sketch of Bayou Teche which depicted 41 obstructions to navigation within the bayou (Figure 14). He also requested that these obstructions be removed. While many consisted of trees within and overhanging the bayou, the majority were sunken vessels, most of which Trinidad named. In 1870, the *Warren Bell* itself sank in the Teche after it hit a shallow underwater obstruction.

ROUGH SKETCH

BY

E. B. TRINIDAD,

CAPTAIN OF U. S. MAIL STEAMER, "WARREN BELL."

ROUTE 8074.

31. *Sunken pontoon bridge.*
32. *C. S. gunboat "Cotton," with its very heavy machinery.*
33. *Live oaks overhanging.*
34. *Cypress trees in the channel.*
35. *C. S. gunboat "Fly Catcher."*
36. *C. S. schooner "Mary Brown."*
37. *C. S. schooner "Alligator."*
38. *C. S. live oak obstructions.*
39. *C. S. mud-dlyger "Turtle."*
40. *C. S. torpedo machine.*
41. *Overhanging live oaks.*

1st. Bayou Teche is the most remarkable stream in Louisiana; it is occupied by sugar plantations, partly owned by Northern capitalists who have purchased within the last four years. The sugar crop of 1868 will figure about 12,000 hogsheads and the cotton crop about 8000 bales.

2d. The almost complete obstruction of this stream is a great drawback on commerce and agriculture. The channel is filling up rapidly. With an appropriation of fifty or sixty thousand dollars it could be thoroughly cleaned out.

Respectfully,

E. B. TRINIDAD,

Captain Commanding U. S. Mail Boat, Route 8074.

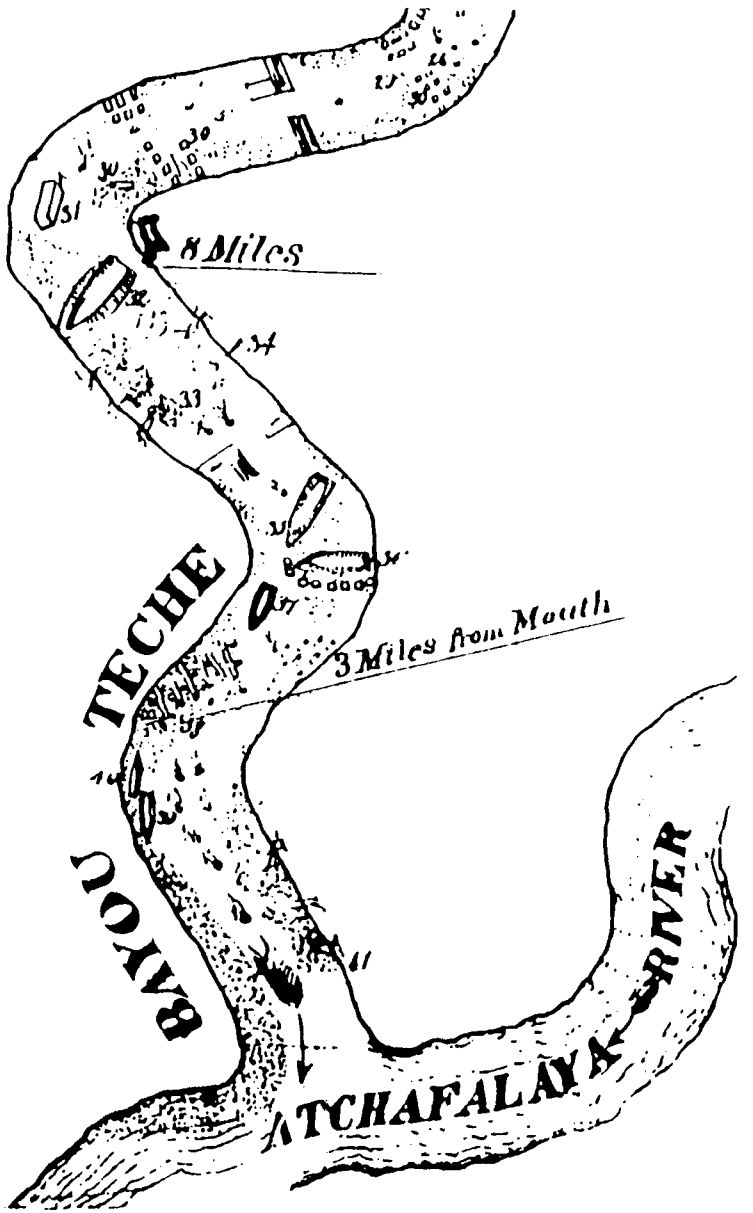


Figure 14. Excerpt from E.B. Trinidad's 1868 *Rough Sketch [of Bayou Teche]*, showing the project area (National Archives, Cartographic Division, Washington, D.C.).

In response to the need for a cleared channel, legislation was passed in 1870 directing the U.S. Army Corps of Engineers to survey Bayou Teche, from its mouth to River Mile 75.5, for obstructions, and to prepare a cost estimate for removing these obstructions. The resultant survey was conducted in May 1870 by Major C.W. Howell, of the Corps of Engineers (Figure 11). The obstructions within the channel subsequently were removed (U.S. Army Corps of Engineers 1870, 1915).

Throughout the 1870s, waterborne commerce on the Teche continued to expand. By 1884, Major Stickney, of the Corps of Engineers, wrote:

> The commerce of the Teche is considerable, and is probably greater than that of any stream of the same length in Louisiana. The lands bordering the bayou are rich and are all under cultivation, principally in sugar cane. It may be said to be the center of the sugar industry in the State. Cotton, cattle, hides, wool, moss, lumber, &c., are also produced in quantities. The trade supports a line of steamers which make regular trips to New Orleans about three times in two weeks, besides steamers which make daily trips to Morgan City and other small steamers in local trade (U.S. Army Corps of Engineers 1884:1273).

However, the importance of riverine transportation was undermined in the late nineteenth century. In 1869, Charles Morgan purchased the bankrupt New Orleans, Opelousas and Great Western Railroad Company, and changed its name to Morgan's Louisiana and Texas Railroad. While extension of the railroad started slowly, by 1880, Morgan had extended the railroad from Morgan City to Houston (Millet 1983).

The Project Area, 1880-1910

Development along Bayou Teche

The period from 1880 to 1910 was an era of consolidation in the project area. By 1880, the sugar plantation regime had recovered from the Civil War, and the chronicler of the sugar crop no longer felt it necessary to compare annual crops with the pre-invasion yield of 1862. Halted by the war, the trend toward consolidation once again advanced. Furthermore, during these years there was a change in the old antebellum system whereby each plantation was a factory as well as a farm. Large processing plants developed that made it uneconomical and unnecessary for each plantation to have its own sugar house. Figure 15 shows the consolidation of plantations along the lower Teche, 1862-1920, and indicates the development of large sugar factories and their proprietary lands during this period.

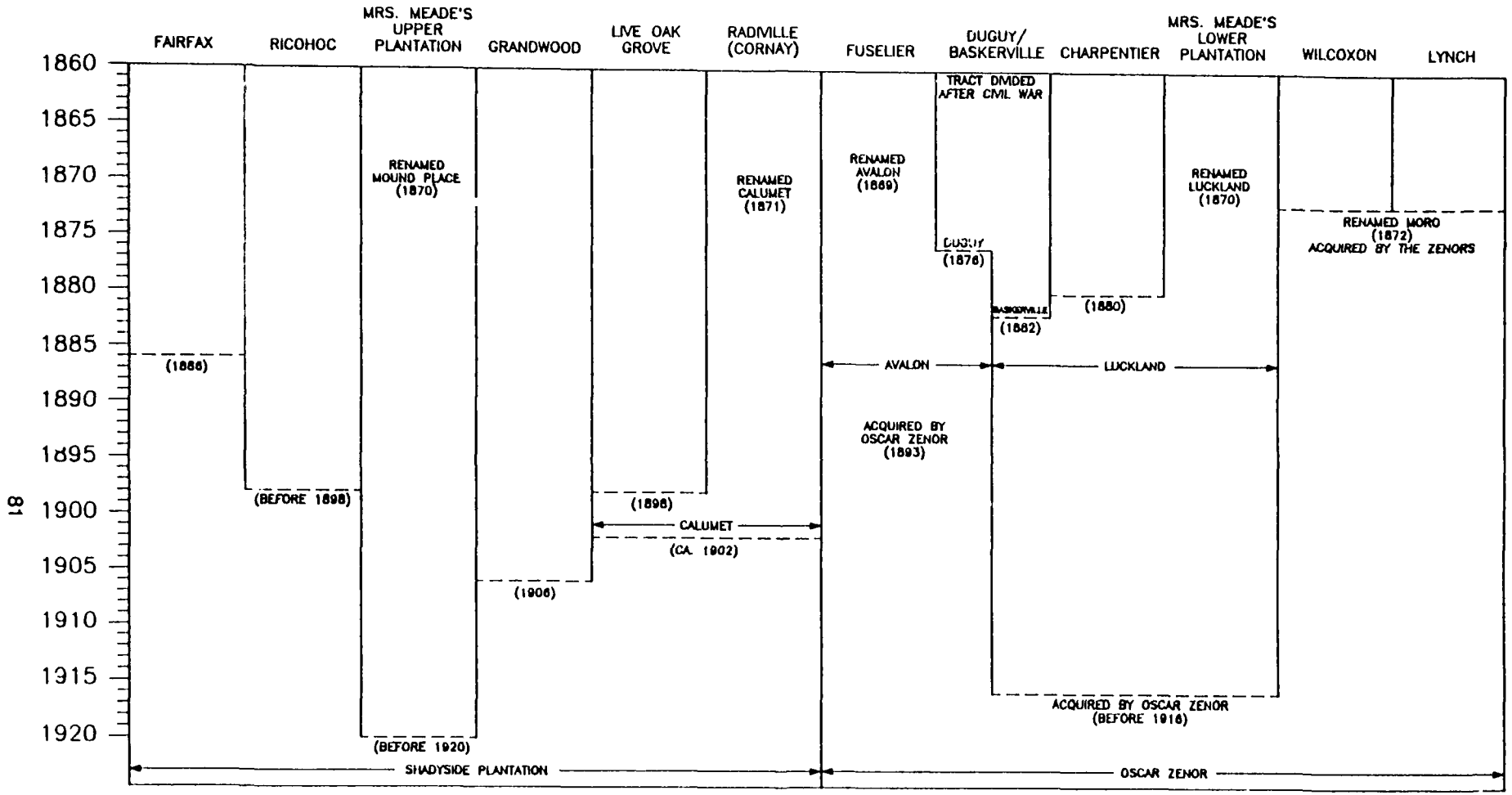


Figure 15. Consolidation of Plantations Along the Lower Teche, 1862-1920. Derived from statements made by Champomier and Bouchereau and Bouchereau pertaining to the areas sugar crops. This chart shows changes in proprietorship, however, this does not always reflect changes in ownership.

Fairfax Plantation in the 1880s was far less prosperous than it had been in the pre-Civil War era. It had poor yields in the decade, and like most of the plantations in the project area, it had no yield at all in 1882, the year of the disastrous flood along the Teche. In the season of 1886, the plantation attempted to cultivate rice as well as sugar, but this experiment was unsuccessful (A. Bouchereau 1886:11). After 1886, Fairfax Plantation disappeared from the sugar reports as a separate entity. It was absorbed by the Shadyside Company (Figure 8).

Bethel's upper and lower plantations, Grandwood and Live Oak Grove, began the 1880s still manufacturing sugar in Grandwood's brick sugar house. Yields in the 1880s, however, never equalled the pre-Civil War output. In the late 1880s, Grandwood attempted to refine sugar, but this effort failed. Consequently, in the 1890s all the former Bethel holdings were absorbed by Calumet Plantation, Daniel Thompson's establishment below the Bethel tracts. Under Daniel Thompson's proprietorship, Calumet Plantation was among the leading agricultural enterprises in Louisiana. Thompson's experiences at Calumet give insight into developments in the project area in the 1880s and afterward.

Born in Maine in 1821 and orphaned at the age of three, Thompson had been educated as a civil engineer and migrated in the 1840s to the Midwest, where he became involved in the elevator and grain storage business in Chicago. He was so successful that he expanded into other enterprises, including real estate, timberland, oil, streetcar systems, and banking. His health seems to have motivated him to purchase the Cornays' sugar plantation in the project area. At first, he resided there only a few months a year, but in 1879 he made it his permanent residence (Marquette 1940:521-523).

With his business acumen and yankee ingenuity, he invested in apparatus to improve the manufacture of sugar. Early in the 1880s he reported,

> As usual each year I am spending some considerable money ... to increase my sugar house capacity. I am glad to say the manner in which I have done work for other persons gives such satisfaction that I am obliged already to turn away work to the amt. of $12,000 to $15,000. Will probably make for self and others 2,500,000 lbs. sugar which is about the capacity of the house for our short season of say 75 days...(Marquette 1940:536).

In May 1882, however, a severe flood inundated the project vicinity. The flooding destroyed all the crops and put Calumet Plantation under water. There were 11 in of water in Thompson's house. The flood drove the black laborers from their cabins; Thompson put them up in his sugar house, which luckily escaped damage. Every bridge on the bayou was washed away. According to Thompson, "The loss is such that I hear of some places that will not try to start again. Were it not for my fine sugar house and

machinery with its large capacity to do outside work I think I should abandon and flee to the mountains" (Marquette 1940:537).

Thompson's chief contribution to sugar cultivation in Louisiana was his experiments with fertilizer (Heitman 1987:65). By this means, he was able to increase the yield per acre considerably. In 1884, he reported that he had an output of 1,200,000 pounds of sugar from his 300 acres at Calumet. He said:

> The crop for the No. of acres is quite remarkable, and exceeds anything in the State. The price of sugar however is very low and the rate of wages very high, so the profit is not large. I think it is more profitable for me to make sugar for others...than to cultivate the cane....Our improved machinery enables us to compete with the refineries, except in adulterating and they may drive the planters into that, altho I think none of it is done yet on our plantations.... (Marquette 1940:538).

In the late 1880s, Thompson continued to experiment with means of improving cane cultivation and the manufacture of sugar. Before the Federal government sponsored such programs, Thompson created what he called an agricultural experiment station at Calumet Plantation and funded it from his own pocket. His son reported in December 1887 that a chemist and two other experts, one from England, were in the household for the season. The men were experimenting "without marked success" in several new processes (Marquette 1940:544).

Thompson was one of the earliest leaders in the project area to see how profitable it could be to "make sugar for others." The Cornays had built a brick sugar house in the late 1860s. Thompson converted it from steam and kettles to steam and open pans, then to steam kettles, vacuum pans, and centrifugal force. By 1890, he had installed double effects, vacuum pans, and centrifugals (A. Bouchereau 1890-1892:47), and in 1898 the Calumet factory was using the Deming system of clarification (Glass 1898:65). The following year Calumet Plantation produced more than 3,000,000 pounds of sugar for itself and for its neighbors (A. Bouchereau 1899:11). Thompson had the foresight to see that the manufacture of sugar for others could be an extremely profitable means of livelihood.

Thompson's son echoed his father's views. In a speech to the Louisiana State Agricultural Society in 1892, Wilbray Thompson said that the principal impediment to sugar cultivation was the retention of the antebellum system which united the growing of cane with the manufacture of sugar. He called for large central factories to process the product (Sitterson 1953:259).

Below Calumet Plantation was Avalon, the former Fuselier holding. After his election to Congress in 1878, Joseph Acklen sold this property. It eventually came into the hands of John Henderson, who was proprietor during the disastrous flood of 1882. Henderson produced refined sugar in the 1880s but not until 1893 did Avalon assume its position of leadership in the project area. In that year, the plantation was acquired by Oscar and Webb Zenor (A. Bouchereau 1894:8). A few years later, they listed the size of Avalon as 1,300 acres (Glass 1898:75). Converting the sugar house to double effects, vacuum pans, and centrifugals, the Zenors made Avalon a leading factory for the manufacture of sugar, producing more than 3,000,000 pounds annually from 1900 to 1910.

Below Avalon was Luckland Plantation, the establishment in the 1880s of Dr. H. J. Sanders. He created Luckland from Mrs. Meade's lower holdings and from the tract of Joseph Charpentier. In 1882, he acquired the former Baskerville plantation (A. Bouchereau 1883:13). Sanders in 1886 consolidated sugar manufacture into one factory on Mrs. Meade's lower tract on the left bank, and he converted her sugar house to steam kettles, vacuum pans, and centrifugals (A. Bouchereau 1887:8). He soon was manufacturing for his neighbors almost as much sugar as Daniel Thompson of Calumet. By the 1890s, Sanders had converted the sugar house at Luckland to double effects, vacuum pans, and centrifugals in a sugar house constructed of wood and iron. In 1896, he manufactured more than 3,000,000 pounds of sugar (A. Bouchereau 1896:8). This was clearly sugar production for others; Luckland Plantation at the time consisted of only 572 acres (Glass 1898:73). After the death of Sanders early in the next century, his family leased the Luckland operation. It still was manufacturing sugar in 1910, but it had dropped behind its competitors at Shadyside and Avalon.

At the lowest reach of the project area was Moro Plantation, which the Zenor family had created from the Wilcoxon and Lynch holdings. In the 1880s, the Zenors transferred production of sugar from Moro to their factory at River Side, outside the project area below the town of Patterson. When the Zenors acquired Avalon in 1893, they also used its factory for the production of sugar. Nevertheless, the Zenors continued to operate a large cane plantation at Moro. In 1898, this plantation consisted of 295 acres (Glass 1898:75).

By the turn of the century, considerable consolidation took place within the project area and the planting of cane had been separated from the manufacture of sugar. Shadyside emerged as the giant in the vicinity, controlling Fairfax and Ricohoc plantations but manufacturing sugar outside the project area at the factory at Shadyside. The Ohio-born proprietor of Shadyside, James W. Barnett, was among a prominent group of northern businessmen who entered the sugar industry after the Civil War (*Louisiana Planter and Sugar Manufacturer* XXXIII:117). Barnett joined a series of plantations which in 1898 encompassed more than 5,000 acres of land, 3,000 of which were in cultivation. The acreage would increase in the twentieth century. There was a private tramway joining the different plantations, besides the railroad line which had a private locomotive and 60

cars to haul cane in the height of the harvesting season. At the refinery at Shadyside, up the bayou, the equipment included a Krajewski crusher, a six-roller mill, one 9 ft and one 10 ft vacuum pan, ten centrifugals, a 150,000 pound double effect, Deming system of clarification, and numerous pumps and boilers (Glass 1898:71). In 1902, Shadyside manufactured more than 9,000,000 pounds of sugar.

Below Fairfax at the beginning of the century was Calumet Plantation, which absorbed the former Bethel Plantations. Daniel Thompson died in 1900, but his heirs still held Calumet, where in 1902 they manufactured more than 3,000,000 pounds of sugar. Oscar Zenor of Avalon, that same year, also exceeded the 3,000,000 pound mark, and manufactured almost as much sugar as the Thompson heirs at Calumet. Luckland Plantation, however, had dropped behind; the factory there produced only 2,200,000 pounds. Oscar Zenor's Moro Plantation continued to grow cane to be manufactured into sugar at the Zenor's plantation at Avalon (A. Bouchereau 1902:11).

By 1910, Shadyside had acquired Daniel Thompson's holdings at Calumet, closed down his sugar factory, and transferred operations up the bayou to it plant at Shadyside. James Barnett died in 1904, but his sons led the giant corporation. Shadyside manufactured sugar from the canefields of Fairfax, Ricohoc, Grandwood, Live Oak Grove, and Calumet Plantations. After 1910, Little Mound Plantation, Mrs. Meade's upper tract, would be added to Shadyside's lands. The fields of the project area were still planted in cane in 1910, but the manufacture of sugar there was confined to two plants: Avalon, the establishment of the Zenors, and Luckland, still leased by the heirs of H. J. Sanders. In 1912, Shadyside manufactured 8,500,000 pounds of sugar, Avalon produced almost 4,000,000 pounds, and Luckland's output was less than 2,000,000 (A. Bouchereau 1912:13). In this age of corporate growth, it was clear which enterprise would be the next absorbed. Soon thereafter, Avalon engulfed Luckland and the entire project area was divided between Shadyside and Avalon, the enterprise of the Zenors.

Decline of Navigation of Bayou Teche

During the late nineteenth and early twentieth centuries, utilization of Bayou Teche as an important transportation route declined rapidly. Increasing amounts of cargo and numbers of passengers utilized the less expensive, faster, and more reliable railroad. By the 1890s, most of the local waterborne freight was carried on packet boats such as the *John M. Chambers*, and the two packet boats operated by Captain L. T. Belt's New Iberia stationed Belt line. These packet boats maintained regular schedules on the Teche as they transported mail, cargo, and passengers. However, they were unable to efficiently compete with the railroad; by 1915, packet boats no longer were used along the Teche (Brasseaux 1979).

The Decline of the Project Area, 1911 and After

Deterioration of Plantation Complexes

A severe decline in sugar production occurred after 1911, and in the 1920s the sugar industry was confronted with extinction. Bad weather contributed to the troubles of the planter. In 1911, there were severe early frosts, and in 1912 floods damaged crops. Furthermore, plant disease, particularly mosaic, swept through the canefields with devastating effect. Other problems were the higher cost of labor, especially after the wartime economy offered better paying jobs to workers in the canefields. Prices for sugar were unusually low, and a new Democratic administration in Washington, that of Woodrow Wilson, passed a bill which abolished the tariff on sugar.

The world war brightened the outlook of sugar planters temporarily. Congress repealed the free sugar bill, and an international shortage raised sugar prices to their highest level since 1889. Furthermore, in 1916 Louisiana planters had a bountiful crop. Nevertheless, the Federal government issued wartime controls which limited profits during the conflict.

After the removal of controls, the sugar market entered a period of chaos. The expectation was that the price of sugar would rise on the world market. Instead, it collapsed and caught planters, manufacturers, and bankers by surprise. Louisiana sugar planters and manufacturers entered the 1920s in a severe depression from which many would not recover.

This economic decline increased the movement toward consolidation of sugar factories but at the same time brought about a countermovement in the breakup of large cane plantations. Some plantations were abandoned; others were broken up into smaller holdings (Sitterson 1953:343-360).

By 1917, when the United States entered the world war, there were only two sugar manufacturers in the project area. Shadyside, with quadruple effects, vacuum pans, and centrifugals, produced almost 11 million pounds of sugar. Oscar Zenor's Avalon, which recently had taken over Luckland, had double effects, vacuum pans, and centrifugals; Zenor produced almost 6,000,000 pounds of sugar in 1917 (A. Bouchereau 1917:13).

As for cultivation of cane in the project area in 1917, Shadyside's fields included: Fairfax -- 800 acres; Little Mound -- 230 acres; Grandwood -- 800 acres; and, Calumet -- 1,200 acres. Oscar Zenor's cane planting fields were Avalon -- 1,000 acres and Luckland -- 1,200 acres. Zenor also was involved in cane growing up the bayou as President of the Cypremort Land Company, which probably acted as a holding company for several plantations outside the project area (Gilmore 1917:38-40).

Two maps in the St. Mary Parish Courthouse present a picture of the project area in 1920, just before the economic deluge began. The first map shows the extensive plantations of the Shadyside Company, Limited, and includes Calumet Plantation and the entire project area above that holding. The second map shows the waterfront at Avalon Plantation, which seems more like a tiny village than a plantation. A bridge across the Teche, extensive wharfage, a sugar factory, and a total of about 34 structures were depicted (Figure 16).

The collapse of the price of sugar in 1920 particularly affected the enterprises of Oscar Zenor, the proprietor of Avalon Plantation. By 1923, Avalon had ceased the manufacture of sugar and confined its operations to the planting of cane (Louisiana Planter 1923:498-499). After 1923, no processing plant in the project area existed, and structures associated with sugar production at Luckland and Avalon began to deteriorate.

Shadyside continued production through most of the 1920s at its factory outside of the project area; in 1928, it closed (Louisiana Planter 1929:49). The international economic depression of 1929 severely increased the troubles of a sugar industry which already was in crisis, but somehow Shadyside was able eventually to resume operation and to transfer production to a location in Franklin, where it continued production into the post World War II era (St. Mary Parish Planning Board 1949:104-105). Its earlier competitors in the project area, however, never resumed the manufacture of sugar. As maps indicate (Figure 17), the structures in the project vicinity associated with sugar production began slowly to disintegrate and, as the years passed, to disappear.

Examination of twentieth century maps and aerial photographs graphically illustrate changing settlement patterns within the project area during the 1930s through 1960s. By 1930, virtually all of the project area upriver from Section 49 was uninhabited cultivated fields or woods. The 1930 Corps of Engineers aerial photograph of the area, and the 1935 topographic quadrangle, indicate only two structures were located in this upriver half of the project area. One was at the intersection of Zenor Road, the east bank road which parallels the bayou, and the road in Section 50 which crossed the bayou. Based on available USGS topographic quadrangles, this building was razed between 1954 and 1966. The other structure was a small boathouse at the head of a small slip in Section 49. That boathouse was torn down prior to 1944, when a second set of aerial photographs were flown over the area.

Two additional mid-nineteenth century structures were located near the upstream end of the project area. These two unidentified structures were located within Section 54, near the Bayou Teche cut adjacent to the Wax Lake Outlet. Based on the available topographic quadrangles, they were constructed during the late 1930s or early 1940s, and they were destroyed in the 1950s or 1960s. Their remains are located at Calumet (16SMY67), one of the sites identified during the current investigations.

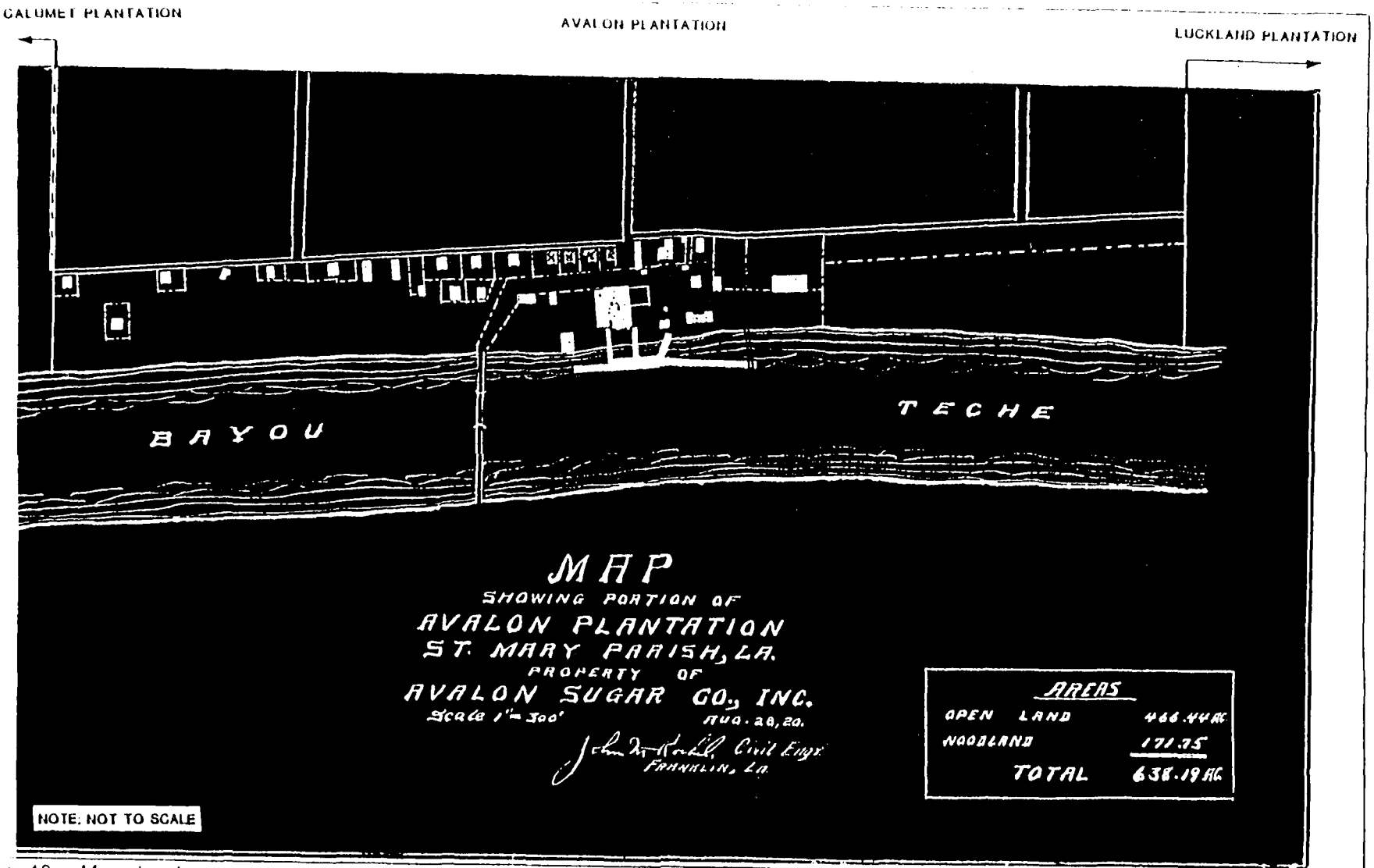


Figure 16 *Map showing portion of Avalon Plantation, St. Mary Parish, LA., property of Avalon Sugar Co., Inc.*, 1920 (St. Mary Parish Courthouse, Clerk of Court Office, Map Book 1).

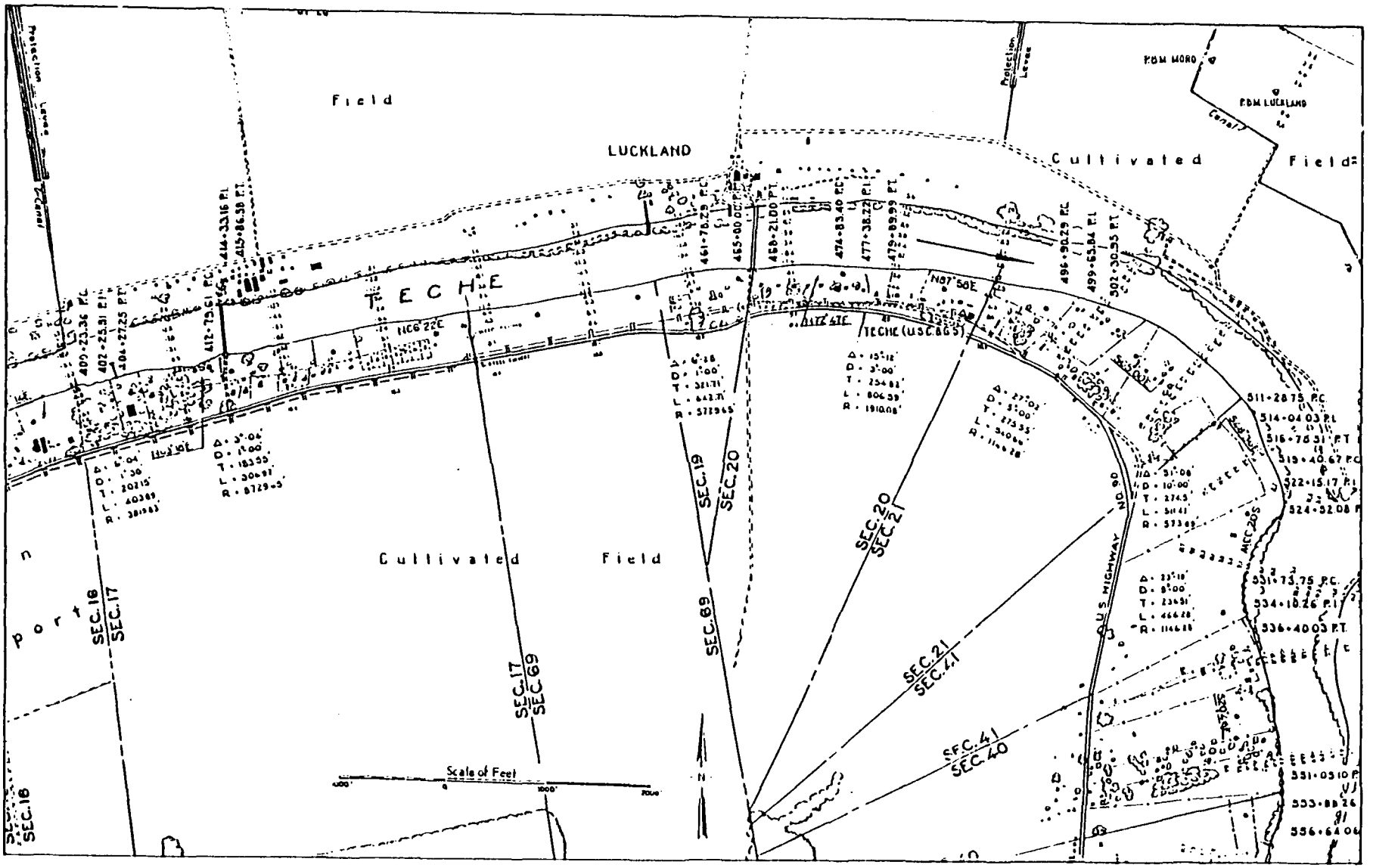


Figure 17. A portion of the 1935 *West Atchafalaya Basin Protection Levee, Bayou Teche Levee Survey* (1935), U.S. Army Corps of Engineers, File H-8-12471, showing structures at Avalon, Luckland, and Moro Plantations (U.S. Army Corps of Engineers, New Orleans District).

The downstream half of the project area, within Avalon, Luckland, and Moro Plantations, changed considerably after the 1920s. A 1920 plan of Avalon Plantation, north of Bayou Teche, depicted 36 structures, including a sugar house, a large wharf, a bridge, numerous domestic structures, and outbuildings (Figure 16). In 1930, when aerial photographs were taken of the bayou (Figure 18), all of the structures remained except for one. The 1930 aerial photograph depicts approximately 37 structures in the vicinity of the adjacent downstream Luckland Plantation, also including a sugar house, a bridge, and domestic residences and outbuildings. Approximately 15 structures were associated with Moro Plantation (Figure 18).

The 1920s collapse of the sugar industry resulted in the abandonment and destruction of these plantation complexes. The 1941 USGS topographic quadrangle depicts only eight Avalon Plantation, 13 Luckland Plantation, and eight Moro Plantation buildings north of the Teche. While this map may not depict all outbuildings, it clearly demonstrates the abandonment of these complexes. No more than six structures, including outbuildings, are present at Avalon on the 1944 aerial photograph; the sugar house is destroyed, the bridge no longer is functional, and the wharf no longer is standing. The 1954 USGS topographic quadrangle notes only five Avalon Plantation, 11 Luckland Plantation, and eight Moro Plantation structures surviving in the project area. The 1966 USGS topographic quadrangle depicts only two outbuildings, both on Luckland Plantation, remaining north of the Teche in the project area. One deteriorating historic shed currently remains standing within the Luckland Plantation area. The project area at Moro, Luckland, and Avalon Plantations currently is woodland, wooded pasture, and overgrown fields.

Twentieth Century Navigation of Bayou Teche

The final stage in the widespread use of steamboats along Bayou Teche consisted of "jobbing," where steamboat captains conducted a variety of charter services for local plantations and businesses. These jobber boats, which operated between the 1890s and the mid-1930s, undertook transportation jobs, often for local plantations, which the railroad system was incapable or unwilling to perform. For example, Brasseaux (1979:219) noted:

> . . . from 1907 to 1922, the B. C. Taylor line of steamboats, which were under contract to the Stirling Plantation manager, freighted coal, fertilizer, and cooperage materials to, and rice, sugar cane, and mollasses [*sic*] from, plantations along the Teche. Moreover, from 1915 to 1922, the Taylor boats delivered annually approximately 1.5 million barrels of fuel oil to local sugar mills.

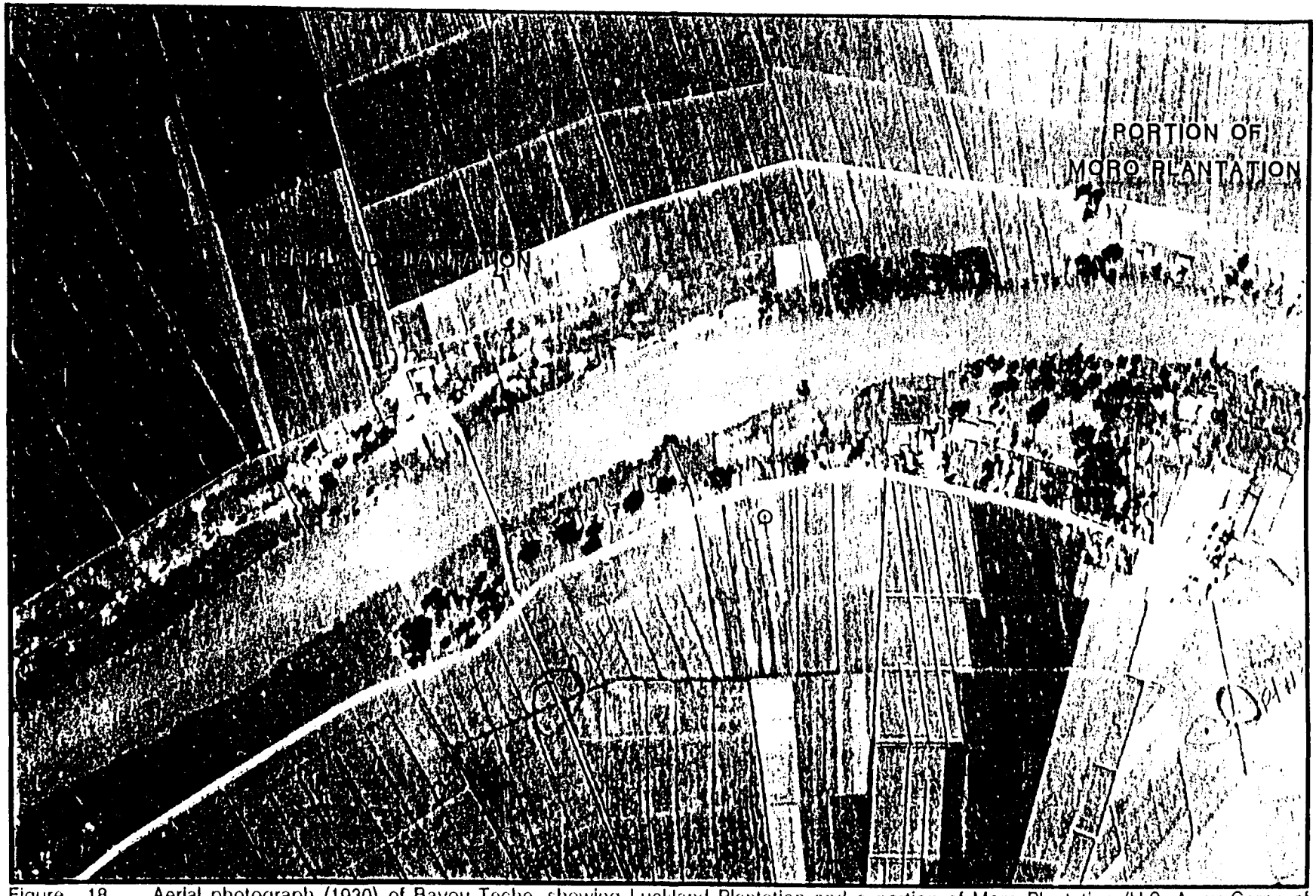


Figure 18. Aerial photograph (1930) of Bayou Teche, showing Luckland Plantation and a portion of Moro Plantation (U.S. Army Corps of Engineers, New Orleans District).

In addition, a few companies, such as the Consolidated Companies of Plaquemine, and the Interstate Wholesale Grocery Company of Thibodaux, operated steamboats on the Teche during the 1920s through early 1940s which regularly delivered groceries to wholesalers (Brasseaux 1979).

In addition to charter steamboats, some plantations along Bayou Teche owned and operated plantation steamboats. For example, within the project area, the sternwheeler *Peri* was owned by the Oscar Zenor family, of Moro, Luckland, and Avalon Plantations (Figure 19). This 102 ft long, 25.5 ft wide steamer weighed 71 gross tons (64 net tons), and had a 4 ft depth of hull. It was built in 1893 at Berwick, Louisiana, and its homeport was listed as Brashier, Louisiana. The vessel was classified as a towboat (Merchant Vessels of the U.S. Bureau of Navigation, Department of Commerce). Since no railroad spur was constructed between these plantations and the railroad, the *Peri* formed a necessary transportation link between the plantations and the railroad. According to Maria Guarisco, a granddaughter of Oscar Zenor, during the late 1920s or the 1930s, the *Peri* also was used for entertainment and parties. It subsequently was sold to an individual near Cincinnati, Ohio, who purportedly converted it into a pleasure vessel (Maria Guarisco, personal communication 1990).

Finally, during the late nineteenth and early twentieth century, the Teche was used as a transportation route for logging boats. These boats transported logs from the cypress swamps in the Atchafalaya Basin to sawmills along Bayou Teche. The *Amy Hewes*, owned by the Hewes Lumber Company of Jeanerette, was the last logging steamboat to operate on the Teche. It transported its final raft of cypress logs on the Teche in 1943, terminating commercial use of the bayou by steamboats (Brasseaux 1979; Goodwin and Jones 1986).

While railroads often serviced individual plantations and businesses during the late nineteenth and early twentieth century, the modern rail system is more closely tied to distribution centers, such as Morgan City. Many of the commercial transportation needs have been met by vehicular transportation. However, Bayou Teche has continued to play an important role in the transportation of cargo in the region. For example, between 1979 and 1986, an annual average of 635,745 tons of cargo have been transported on the Teche. These cargoes principally included marine shells, crude petroleum, and sugar (U.S. Army Corps of Engineers 1989). Modern commercial businesses within the project area vicinity include a shipyard, and an oil distribution facility.

Modern Navigational Modifications and Improvements to Lower Bayou Teche

In 1942, construction of the Wax Lake Outlet was completed at the upriver end of the project area. This outlet extends from Six Mile Lake, through the Bayou Teche natural levee, and into Atchafalaya Bay; it is approximately 15.7 mi (25.3 km) long. It is designed

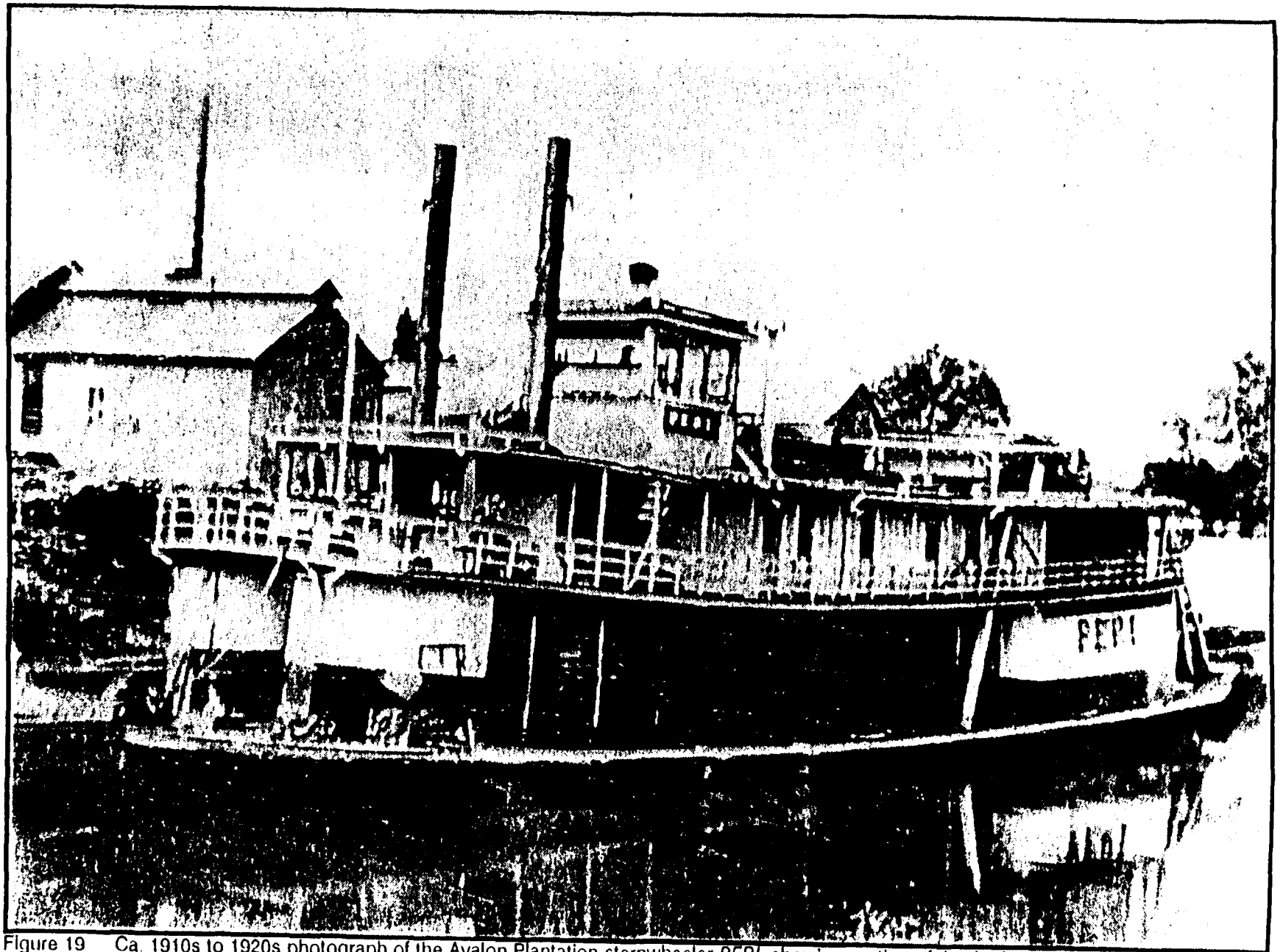


Figure 19 Ca. 1910s to 1920s photograph of the Avalon Plantation sternwheeler *PERI*, showing portion of the Avalon Plantation sugar house and smokestack in the background (Courtesy of Maria Guarisco, Patterson, Louisiana).

to reduce flooding along the natural levees of Bayou Teche and Bayou Boeuf. The East and West Calumet Floodgates subsequently were constructed along Bayou Teche on either side of the outlet; they were completed in 1950. These floodgates permit navigation of the bayou, and regulate the bayou's flow (U.S. Army Corps of Engineers 1989). The East Calumet Floodgate has terminated most of the downstream flow into Lower Bayou Teche, which encourages siltation within the bayou.

Major dredging of the Lower Bayou Teche channel has occurred twice: in 1941, and again in 1964. The 1964 dredging extended upriver from the downriver end of Luckland Plantation. At that time, the channel was enlarged to 8 x 80 ft (2.4 x 24 m), with 1 on 2 side slopes. Over 245,622 cubic yards of dredged materials were removed from the bayou at that time, and placed along the adjacent banklines (U.S. Army Corps of Engineers 1964, 1965).

Two additional channel improvement constructions have been conducted along Lower Bayou Teche since 1964. In 1965, numerous snags resulting from Hurricane Hilda were removed from the Teche. Finally, in 1969, limited dredging was conducted near Rizzo Bridge, the only extant bridge within the project area. This dredging may have impacted three brick barges depicted on Howell's 1870 plan of the bayou (Figure 11) (Goodwin, Poplin et al. 1988).

Riverine Resources

Several references provided information used in creating a shipwreck data base for the Bayou Teche portion of the project area. These sources included historic maps (Figures 11 and 14), the New Orleans District shipwreck data base (Pearson et al. 1989), and a list of wrecks obtained from Mr. Mike Davis of the Morgan City Traffic Control Group, U.S. Coast Guard.

A total of 14 wrecks have been reported in the project area (Table 2). However, two of these are questionable; *Dredge #4* and the paddleboat *Southern Lady* reportedly sank in the Teche, but longitudinal data place these wrecks east of the bayou's mouth. Data on five other wrecks suggest that they may have been lost within the project area.

An error factor of approximately 400 ft was introduced by the map projection used by Howell (1870) to record cultural features in his expanded view of feature locations along Bayou Teche (Figures 11 and 12). For example, the *Flycatcher* is drawn as though 400 ft wide, when its actual width measured 13.5 ft. Similarly, the Howell map depicts a schooner full of brick that, according to the map, measures 20 ft wide and 1800 ft long.

Historical data were obtained for most of the registered vessels thought to have sunk in the Teche. The exceptions are the schooners *CSS Alligator* and *John Bowles*;

Table 2

STUDY AREA WRECK LIST

Name	Date	Vessel Type	Source
CSS Alligator	1863	CS schooner	Trinidad 1868
CSS *Flycatcher*	1863	Screw steam (Built 1860)	Trinidad 1868; Howell 1870
CSS J.A. Cotton	1863	Side wheeler	Trinidad 1868; Howell 1870
John Bowles	1863	Schooner	Howell 1870
CSS *Mary Brown*	1863	CS schooner	Trinidad 1868
Mary F. Golden	1908	Side wheel steamer	Pearson and Saltus 1989
CSS Turtle	1863	CS muddigger	Trinidad 1868; Howell 1870
n/k	1863	CS torpedo machine	Trinidad 1868; possibly Howell 1870
n/k	1863	Three brick barges	Howell 1870
n/k	1863	One brick barge	Howell 1870
		Questionable historic wreck locational data	
Dredge #4[1]	n/k	n/k	U.S. Coast Guard Wreck List for the Gulf of Mexico Area, Morgan City, Louisiana; Pearson and Saltus 1989
Southern Lady[1]	n/k	Paddleboat	U.S. Coast Guard Wreck List for the Gulf of Mexico Area, Morgan City, Louisiana; Pearson and Saltus 1989
		Bayou Teche, General Location, Wreck Data (wrecks which could be in the area)	
Anna E.	1871	Side wheeler steamer	Berman 1972
Arkla[2]	1934	Stern wheel steamer	Berman 1972
Grand	1921	Steamer (Built 1905)	Berman 1972
J. B. Chauvin	1916	Steamer (Built 1916)	Berman 1972
Warren Bell	1870	Side wheeler steamer (Built 1865)	Berman 1972

KEY

1 = In Lower Teche but poor Loran C latitude/longitude data
2 = Patterson, Louisiana
n/k = Not known

the two wrecks appearing on the Coast Guard wreck list, *Dredge #4* and the paddleboat *Southern Lady*; and, a Confederate "torpedo machine" and the muddigger *CSS Turtle*. The *CSS Alligator*, *John Bowles*, the Confederate torpedo machine, and the muddigger *CSS Turtle* all were Confederate vessels which probably were renamed after being pressed into service (Saltus 1984). The following data are provided on the vessels reportedly lost within the project area.

Anna E.

The *Anna E.* was a sidewheel steamboat built in New Albany, Indiana, in 1864. The steamboat measured 114.8 ft long and 22.2 ft wide. It weighed 64.2 tons and drew 3.4 ft. of water. The Anna E. had a round stern, a plain head (bow), and a cabin on deck; she had no masts. The Anna E. was lost in Bayou Teche on November 15, 1871.

Arkla

The *Arkla* was a stern wheel steamboat built in Franklin, Louisiana, in 1904. It measured 95.0 ft long and 20.0 ft wide, and it weighed 60 tons. The Arkla was used for towing; the steamboat burned near Patterson, Louisiana on June 16, 1934.

Flycatcher

The *Flycatcher* was a screw propeller driven steamer built in Manchester, Pennsylvania, in 1860. It weighed 37 49/95 tons, and it measured 74 ft long and 13.5 ft wide. It had one deck, no masts, a pink stern, a plain head (bow), and a cabin on deck. The steamer was intentionally sunk and used as an obstruction during the Bayou Teche Campaign (1863).

Grand

The *Grand* was a side wheel steamboat built in Grand Rapids, Michigan, in 1905. Its weighed 124 tons, and it was 136.3 ft long and 32.3 ft wide. This passenger vessel was lost by fire in Bayou Teche on May 17, 1921.

J. A. Cotton

The *J. A. Cotton* was a sidewheel steamboat built in Jeffersonville, Indiana, in 1861. It weighted 549 9/95 tons, and it was 229 ft long, 36 ft wide, and 7 ft deep. It had one deck, a transom stern, a plain head (bow), and a cabin on deck. She also was sunk and utilized to obstruct the Teche during the Bayou Teche Campaign.

J. B. Chauvin

The *J. B. Chauvin* was a 112 ton side wheel steamboat built in 1916. It burned in Bayou Teche on November 8, 1916.

Mary Brown

The *Mary Brown* was a schooner built in Buffalo, New York, in 1861. It weighed 223.73 tons, and it measured 118.5 ft long, 26.7 ft wide, and 10.3 ft deep. It had one deck, two masts, a square stern, and a billethead. According to Captain Trinidad, this vessel was lost in Bayou Teche between SRM 3 and Bethel's bridge, downstream from the *Flycatcher*. The 10.3 ft depth suggests that this vessel was a coastal schooner.

Mary F. Golden

The *Mary F. Golden* was a side wheel steamboat built in Millwood, West Virginia, in 1896. It weighted 37 tons, and it was 41.5 ft long, 13.8 ft wide, and 4.6 ft deep. The vessel was in the freight service. It burned when the kitchen stove caught fire at the mouth of Bayou Teche in 1908.

Warren Bell

The *Warren Bell* was a side wheel steamboat built in Louisville, Kentucky, in 1865. It weighed 242.23 tons, and it was 144 ft long, 25 ft wide, and 5.4 ft deep. It had a plain head (bow) and a cabin on deck. In 1868, Captain E. B. Trinidad, of the *Warren Bell*, prepared a sketch map depicting some of the obstructions in the Teche. In February 1870, the *Warren Bell* sank after it hit a snag in the Teche.

CHAPTER VI

ARCHEOLOGICAL EXPECTATIONS AND FIELD METHODOLOGY

Archeological Expectations

Prior to field survey, data were collected from which archeological expectations were formed. Based on historical maps and on review of the geomorphological and historical development of the surrounding area, the locations of both prehistoric and historic archeological resources in the project area were predicted. Based on the probable prehistoric development of the project area, as discussed in Chapter II, no Poverty Point sites were anticipated in surface deposits. Any earlier sites probably were buried, making their identification unlikely. While Poverty Point through Troyville sites probably occur along the Teche, known prehistoric sites from the area generally are associated with Coles Creek-Plaquemine Culture. Since the Atchafalaya Basin site (16SMY10), a Coles Creek-Plaquemine four-mound ceremonial center, is situated a short distance east of the project area, contemporaneous satellite communities were anticipated within the project area. The area near the openings of two crevasse splays that extend north from Bayou Teche also were thought to be potential site locations. These crevasses occurred in Sections 43, 44, and 18; and Section 51.

A wide variety of historic resources was expected within the project area. These included the remains of antebellum homes and sugar houses, Civil War resources, and postbellum and twentieth century plantation remains. Mid-nineteenth century underwater resources also were anticipated, including sunken vessels, bridge remains, and large obstructions placed in the river during the Civil War. Pre-fieldwork archeological expectations are summarized on Table 3.

Field Methodology

Field survey for the Historical and Archeological Investigations of Fort Bisland and Lower Bayou Teche project was divided into three segments: a riverine magnetometer survey of Lower Bayou Teche; a terrestrial survey of Lower Bayou Teche; and, an archeological investigation of a portion of the Fort Bisland battlefield.

The riverine survey of Lower Bayou Teche utilized a marine magnetometer, a Loran-C positioning system, and a recording fathometer. Transects were spaced at less than 30 m (100 ft) intervals, and positioning control points were obtained along each transect. Maximum background noise did not exceed +/- 3 gammas; readings were recorded at the 100 gamma scale. Data locations were recorded using the Louisiana Coordinate System. A sufficient number of additional tightly spaced transects were placed over potentially significant anomalies to delineate their location and orientation.

Table 3

ANTICIPATED HISTORIC ARCHEOLOGICAL RESOURCES IN THE SURVEY AREA

Section Number (T15S, R11E)	Description	Date	Source
TERRESTRIAL RESOURCES			
Sections 21 and 41 (west bank of Bayou Teche)	Up to five structures at southwest end of survey area	Twentieth century	Aerial photographs, 1930; 1933, 1941, and 1954 U.S.G.S. 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 U.S.G.S. 7.5' series topographic quadrangle, Patterson, Louisiana
Edge of Section 41; Section 42 (east bank of Bayou Teche)	House of T. Wilcoxson near center of Section 42	Burned 1862 or 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives)
	Moro Plantation - eight to 10 structures in survey area; all were destroyed by 1966	Postbellum and twentieth century	Aerial photographs, 1930; 1933, 1941, and 1954 U.S.G.S. 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 U.S.G.S. 7.5' series topographic quadrangle, Patterson, Louisiana
Section 43	House of Mrs. Meade in west half of section	Burned 1862 or 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives)
Sections 43, 18, and 44	Luckland Plantation - approximately 37 plantation structures, including sugar house and bridge; only two outbuildings survived in 1966	Postbellum and twentieth century	*Official Map of the Parish of St. Mary, Louisiana*, 1893 (National Archives); 1930 aerial photographs; 1933, 1941, and 1954 U.S.G.S. 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 U.S.G.S. 7.5' series topographic quadrangle, Patterson, Louisiana
	Cemetery at west edge of Section 44	Observable in 1941-1954	U.S.G.S. 15' series topographic quadrangles, 1941 and 1954, Belle Isle, Louisiana

Section Number (T15S, R11E)	Description	Date	Source
Section 44	Bridge	Postbellum	*Official Map of the Parish of St. Mary, Louisiana*, 1893 (National Archives)
Sections 45-48	*House of A. Fusilier in center of Section 47*	*Burned 1862 or 1863*	*Ca. 1863 Map of St. Mary Parish* (National Archives)
	Avalon Plantation - approximately 36 plantation structures, including sugarhouse, wharf, and bridge; all were destroyed prior to 1966	Postbellum and twentieth century	*Map showing portion of Avalon Plantation, St. Mary Parish, Louisiana*, 1920. (St. Mary Parish Courthouse, Map Book 1); 1930 aerial photographs; 1933, 1941, and 1954 U.S.G.S. 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 U.S.G.S. 7.5' series topographic quadrangle, Patterson, Louisiana
Section 49	Three unidentified buildings in Section 49 vicinity	1862	Carpenter 1886
	Cemetery at east edge of section	Observable in 1941-1954	U.S.G.S. 15' series topographic quadrangles, 1941 and 1954, Belle Isle, Louisiana
	Small building (boathouse?) at head of slip, in west half of section	First half twentieth century	Aerial photographs, 1930
Section 50	Cornay's Bridge near east end of section	Destroyed 1862 or 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives); Goodwin, Poplin, and Hewitt 1988
	Saunders house and landing and sugarhouse	Postbellum	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)

Section Number (T15S, R11E)	Description	Date	Source
	Building at corner of public road parallel to the bayou and road crossing bayou	Twentieth century	Aerial photographs, 1930; 1941 and 1954 U.S.G.S. 15' series topographic quadrangle, Belle Isle, Louisiana
	Bridge in west half of section	Postbellum	*Official Map of the Parish of St. Mary, Louisiana*, 1893 (National Archives)
	Bridge near east end of section	Postbellum (?) and twentieth century	Aerial photographs, 1930; 1933, 1941, and 1954 U.S.G.S. 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 U.S.G.S. 7.5' series topographic quadrangle, Patterson, Louisiana
Sections 50 and 51	Union staging area, near boundary between these sections	1863	Goodwin, Poplin, and Hewitt 1988
Section 52	Bethel's lower sugarhouse (possibly at east end of Section 53) and two associated structures	Antebellum and Civil War; sugarhouse damaged or destroyed 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives); 1863 T. Jekyll *Map No. 16, Battlefield of Fort Bisland* (National Archives); Goodwin, Poplin, and Hewitt 1988; Carpenter 1886
	Sugarhouse, possibly a repaired Bethel's lower sugarhouse	Postbellum	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)
	Bridge	Postbellum	*Official Map of the Parish of St. Mary, Louisiana*, 1893 (National Archives)
Section 54	Possible south flank of principal Confederate earthworks	1863	Goodwin, Poplin, and Hewitt 1988

	Bethel's Bridge	Destroyed 1862 or 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives); Goodwin, Poplin, and Hewitt 1988
	Bridge	Postbellum	*Official Map of the Parish of St. Mary, Louisiana*, 1893 (National Archives)
Sections 55 and 56	Second Confederate defensive line along section line separating Sections 55 and 56	1862 and 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives); 1863 T. Jekyll *Map No. 16, Battlefield of Fort Bisland* (National Archives); Goodwin, Poplin, and Hewitt 1988
	Confederate Redoubt #2, near north end of Section 55, along section line separating Sections 55 and 56	1862 and 1863	*Ca.* 1863 *Map of St. Mary Parish* (National Archives); 1863 T. Jekyll *Map No. 16, Battlefield of Fort Bisland* (National Archives); Goodwin, Poplin, and Hewitt 1988

Section Number (T15S, R11E)	Description	Date	Source
UNDERWATER RESOURCES			
In Bayou Teche, near Sections 45 and 46	Schooner *John Bowles*, Muddigger *CSS Turtle*, and unnamed Confederate torpedo machine	1863 - 1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives); Trinidad, 1868 *Rough Sketch [of Bayou Teche]* (National Archives)
In Bayou Teche, near Section 49	Schooner loaded with bricks	Pre-1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)
In Bayou Teche, near Section 50	Liveoak Obstruction	1862	Ca. 1863 *Map of St. Mary Parish* (National Archives); 1870 C. W. Howell *Survey of the Bayou Teche* (National Archives); Goodwin, Poplin, and Hewitt 1988; Raphael 1975
	Union caisson near burned Cornay's Bridge	1863	Goodwin, Poplin, and Hewitt 1988
	Three brick barges	Pre-1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)
In Bayou Teche, near Section 51	Hull of *Flycatcher*	Sunk 1862	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives); Raphael 1975
In Bayou Teche, near Section 54	Brick barge	Pre-1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)
In Bayou Teche, near Section 55	Confederate ship *Cotton*	Sunk 1862	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives); Raphael 1975
	Schooner adjacent to the *Cotton*	Pre-1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)

The locations of potentially significant anomalies then were probed to provide additional data regarding size and shape (Appendix I). Data collected during the preliminary literature and records review were used to supplement interpretations of the magnetic anomalies identified during survey.

The terrestrial survey of Lower Bayou Teche had several components. Since Bayou Teche had been dredged in 1941 and again in 1964, and because dredged material was deposited along the banks of the bayou, field investigations began with an assessment of dredge disposal patterns within the project area. Twenty-seven 2 in Dutch auger tests, each 1 to 1.5 m deep, were excavated to identify previous dredge disposal areas. Testing revealed that most of the dredged material was confined to the flat, marshy land located immediately adjacent to the bayou. The crest of the Teche-Mississippi natural levee was free of dredged material. The extent of dredge deposits along Bayou Teche upstream from Rizzo Bridge, however, remained unclear.

The Lower Bayou Teche project corridor was divided into nine survey segments (Segments 1 through 9) (Figure 1). For seven of these, Segments 1 through 5, 7, and 9, survey included intensive pedestrian survey along parallel transects spaced 20 m apart. Shovel tests were excavated at 50 m intervals, in an offset pattern. Each shovel test measured approximately 30 x 30 cm, and extended, where possible, into sterile subsoil. Excavated soils were screened through 0.6 cm (0.25 in) wire mesh; artifacts were bagged and labeled by survey segment and shovel test number. Stratigraphic soil profiles of all shovel tests were recorded; all shovel tests were backfilled. A total of 417 shovel tests were excavated in these seven segments. In addition, six auger tests were utilized to define the extent of a shell midden located within Segment 3. Finally, plan drawings of the remains of two sugar houses, one on Luckland Plantation (16SMY71), and the other on Avalon Plantation (16SMY70), were drawn.

Segments 6 and 8 were located within areas likely to contain features associated with the Battle of Bisland. A grid system was established across both areas; all subsequent excavations were tied to this grid. Survey transects were spaced at 10 m intervals; shovel tests were excavated at 20 m intervals along each transect. Deposits of dredge material were identified within both segments. Auger tests were used to test areas where dredge material was encountered. A total of 480 shovel tests and 33 auger tests were excavated within Segments 6 and 8.

Segments 6 and 8 also were surveyed using a magnetometer and a metal detector. Magnetometer survey was conducted along each transect; magnetic readings were recorded at 2 m intervals. Magnetic sampling was taken using the three count averaging mode. Tie lines were established at right angles to the runs, and data collected along these lines were used to correct for diurnal variation. The corrected data then were used to generate detailed contour maps of magnetic readings within the survey segments. A 5 gamma contour interval was used wherever there was not a steep gradient, e.g., at trash piles, appliances, and 55 gallon drums.

The metal detector survey was conducted along every other survey transect in Segments 6 and 8. Locations of metal objects were recorded, and a sample of these objects was recovered.

The W-112 levee item area, designated Segment W-112, was situated along the east bank of the Wax Lake Outlet, north of the Bayou Teche cut. A grid system was established within the segment. In this area, 52 auger tests, some up to 3 m in depth, were excavated at 100 m intervals along three parallel transects placed west of the existing levee. Six additional auger tests were excavated east of the levee. The auger tests were used to delineate the depth and distribution of dredge material deposited during construction of the Wax Lake Outlet. A 75 m wide corridor along the Wax Lake Outlet did not contain dredge material; this area was shovel tested. Shovel testing followed four parallel transects, and tests were spaced at 50 m intervals, except within areas that contained extensive disturbance or standing water. A total of 79 shovel tests were placed within segment W-112.

Two grid cells, each measuring 75 x 133.3 m, were selected within Segment W-112, in areas free of dredged material. One of these, Area 1, was selected randomly, while the other, Area 2, was placed in an area likely to contain large battlefield features. Each of these grid cells was tested for cultural resources using magnetometer and metal detector surveys. North-south transects were placed at 10 m intervals within the established grid system. Magnetometer survey was conducted along each transect, and magnetic readings were recorded at 1 m intervals. The Area 1 magnetic contour map was drawn using 2 gamma contour intervals, while the Area 2 map was drawn using 5 gamma contour intervals, except in areas with steep magnetic gradients. A metal detector survey also was conducted along each survey transect within the two grid cells. Locations of metal objects found during the metal detector survey were recorded.

All sites identified during survey were recorded, as specified in the Revised Scope of Services (Appendix I), through mapping, photography, limited subsurface testing, and limited controlled surface collection. Vertical and horizontal extent, stratigraphy, condition, and cultural affiliation, were recorded for each site. Additional testing was conducted at four of the identified sites: Zenor (16SMY72); Bethel II (16SMY69); Bethel I (16SMY68); and, within Area 2 of Segment W-112, a part of the Bisland battlefield (16SMY166).

At Zenor (16SMY72), locations of observed features, including four brick scatters and ditches, were mapped. Twenty-eight additional shovel tests were placed across two of the brick scatters (Brick Scatters C and D), in order to ascertain the extent and distribution of in situ deposits and features. Two 1 x 2 m test excavation units were placed in Brick Scatter A, while a third 1 x 2 m unit was placed in Brick Scatter B. These units were excavated following the depositional stratigraphy, and then photographed. Stratigraphic profiles were drawn of all units, and descriptive notes were taken. Soil colors were recorded using Munsell Soil Color Charts. Excavated units were backfilled

prior to completion of fieldwork. Finally, a plan view of the visible portion of an in situ brick feature within Brick Scatter A was drawn to scale.

Testing at Bethel II (16SMY69) included excavation of 23 additional shovel tests within and north of the proposed disposal area; these tests served to help define the extent of the site. In addition, a site map was prepared, and artifacts were surface collected.

Site testing at Bethel I (16SMY68) included preparation of a site map and excavation of three 1 x 2 m test excavation units. In addition, two backhoe trenches, each 5 m long, were excavated across magnetic anomalies to locate features. Each trench was dug into culturally sterile deposits, and profiles were drawn of each trench.

Testing of Area 2 of Segment W-112, within Bisland (16SMY166), was conducted in two stages. A large north-south ditch, possibly representing the secondary Confederate earthworks at Bisland, and a shallow ditch which fed into it, were tested using a metal detector. Located objects were mapped, and a sample of these objects was excavated. In addition, two backhoe trenches were placed in Area 2. One was a 9 m long trench that crosscut the possible Confederate trench; the other measured 5 m long, and bifurcated a magnetic anomaly. The profile of each trench was drawn; the sides of each were subjected to metal detector sweeps to locate associated metal artifacts.

CHAPTER VII

RESULTS OF THE TERRESTRIAL FIELD INVESTIGATIONS

Introduction

The entire terrestrial project area was examined for cultural resources within 10 survey segments (Figure 1). Seven archeological sites were identified during the survey, including Moro Plantation (16SMY73), Zenor (16SMY72), Luckland Plantation (16SMY71), Avalon Plantation (16SMY70), Bethel II (16SMY69), Bethel I (16SMY68), and Calumet (16SMY67). Additional data also were collected on the Bisland Battlefield (16SMY166). In this chapter, each segment is discussed, along with cultural resources identified within the segment, and results of any site testing.

Segment 1

Segment 1 is situated on the left descending bank of Bayou Teche, toward the east end of the project area (Figure 1). The segment is covered with mature woods and dense underbrush. During the initial pedestrian survey and shovel testing, 81 shovel tests were placed across the segment, and two historic archeological sites were identified (Figure 20). These sites, Moro Plantation (16SMY73) and Zenor (16SMY72), are separated by 500 m.

Moro Plantation (16SMY73)

Moro Plantation is located on the edge of the natural levee, overlooking Bayou Teche. It is a short distance upstream from its confluence with the Lower Atchafalaya River. The site contains the remains of the postbellum and early twentieth century Moro Plantation; it also may contain an antebellum component. During survey, historic artifacts were recovered from 17 of the 30 shovel tests excavated in the site. These artifacts included whiteware, ginger beer bottles, window glass, several types of bottle glass, nails, brick, coal, and charcoal. Animal bone and *Rangia cuneata* shells also were located within the site. The artifacts generally dated from the late nineteenth to early twentieth centuries, although a few, such as ginger beer bottle and black bottle glass, could predate the Civil War.

One brick concentration and one scatter were observed within the site. The brick concentration was located along Transect 1, between 75 and 145 m east of the end of the segment. Four clusters of brick, all situated along a line parallel to the gravel road, were noted and recorded within the concentration. They were spaced at 17 to 28 m (56

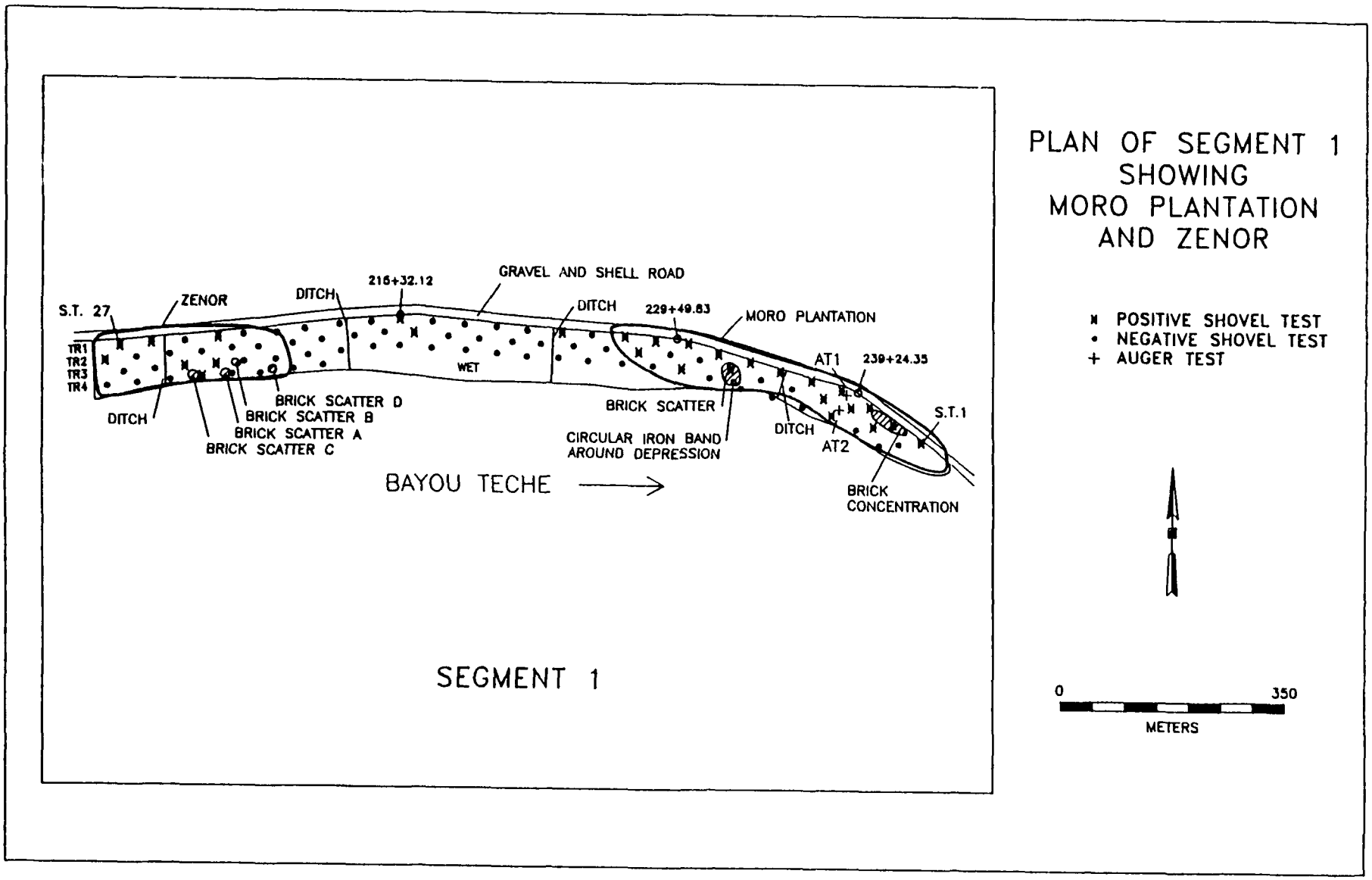


Figure 20. Plan of Segment 1, showing Moro Plantation (16SMY73) and Zenor (16SMY72).

to 92 ft) intervals. No in situ deposits were observed on the ground surface, or in shovel tests excavated in and near the concentration. It probably represents the remains of brick piers associated with Moro Plantation structures, several of which aligned the gravel road which passes through the area (Figure 17).

The brick scatter was observed along Transects 2 and 3, approximately 375 m from the east end of the segment. Whole bricks were located at 30 cm below surface in Transect 2, Shovel Test 7. Also, a 1.5 m diameter circular iron band was observed near Transect 3. The interior of this band formed a 20 cm deep depression, and brick fragments were scattered throughout the area. A shovel test placed in the bottom of the depression indicated disturbed fill to a depth of 15 cm below surface. The band does not appear to have been in situ, and its function remains unclear.

The early twentieth century settlement of Moro Plantation consisted of a series of buildings situated on the upper slopes and crest of the natural levee, on either side of Zenor Road (Figures 17 and 18). As mentioned in Chapter V, approximately 15 structures were standing within Moro Plantation in 1930, including six structures within the project area. Only eight of these buildings are depicted on the 1941 USGS topographic quadrangle. By 1954, only seven of these structures remained; four of these aligned the road within the project area. None of these structures remained standing in 1966. The property currently is woodland.

Zenor (16SMY72)

Zenor (16SMY72) is situated on the natural levee of Bayou Teche. The site is within the upstream 300 m of Segment 1, in Section 43. During pedestrian survey and shovel testing of Segment 1, seven shovel tests excavated within the site area produced artifacts (Figure 20), and four brick scatters were observed along a linear ridge positioned adjacent to Bayou Teche (Figure 21).

During site testing, the site was mapped, and additional testing was conducted at each of the four brick scatters. Brick Scatter A was a 10 x 14 m scatter surrounding a 4 x 5 m diameter, 25 cm high mounded area. Two 1 x 2 m excavation units, Units 1 and 3, were placed within the mounded area to ascertain better the nature of the brick scatter. Unit 1 was placed on the east side of the mounded area within the scatter, extending from the crest of the mound to its bottom. The unit was excavated by natural stratigraphy, in six levels containing four natural strata (Figure 22). Stratum I was the topsoil which covered the scatter; it contained 10YR 3/2 very dark grayish brown silty loam. Artifacts recovered from the stratum included whiteware, glass, cut and wire nails, an iron staple, brick (soft mud, stiff mud, fire brick), and mortar. A fire brick located in the stratum was branded ["MISSOURI]/X[XX]." This brick was manufactured by the Missouri Fire Brick Company, and the brand was in use from at least 1927 through 1930 (Gurcke 1987:266-267).

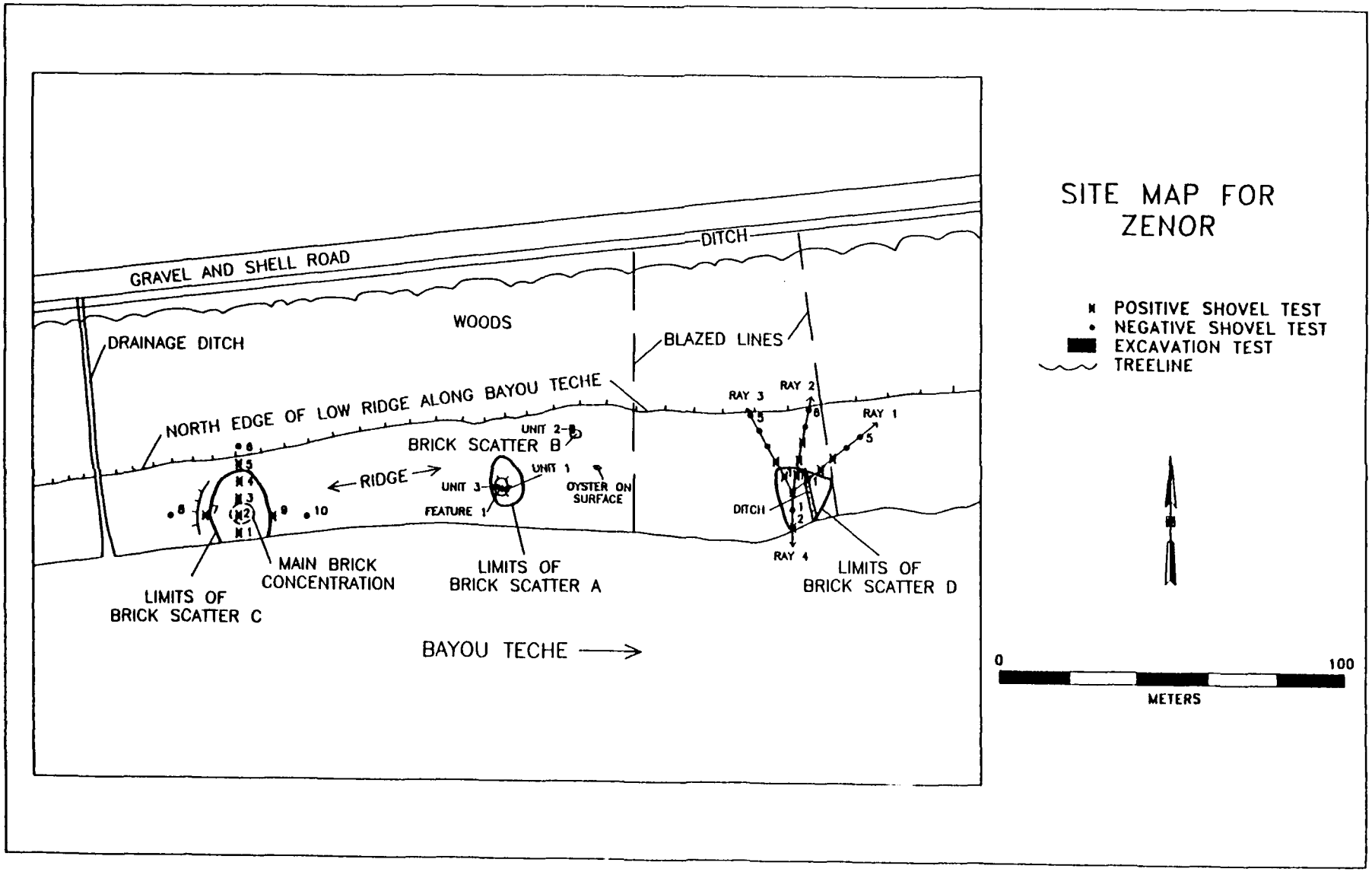
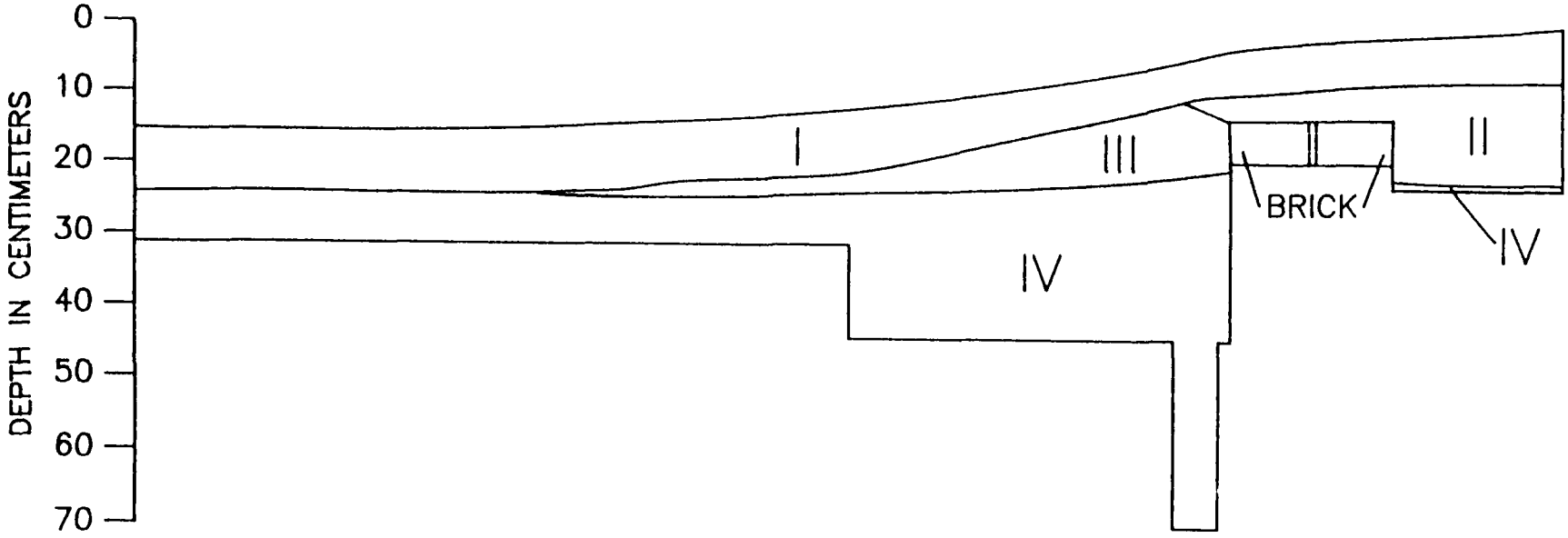


Figure 21. Site plan of Zenor (16SMY72).



I: 10YR 3/2 VERY DARK GRAYISH BROWN SILTY LOAM.

II: 7.5YR 4/4 DARK BROWN SILTY LOAM.

III: 10YR 4/6 DARK YELLOWISH BROWN SILTY LOAM MIXED WITH 10YR 4/4 DARK YELLOWISH BROWN SILTY LOAM.

IV: 7.5YR 4/6 STRONG BROWN CLAYEY SILT.

NOTE: THE BRICKS SHOWN ARE PART OF FEATURE 1.

Figure 22. Stratigraphic profile of south wall of Unit 1, at Zenor (16SMY72)

Stratum II in Unit 1 was a 7.5YR 4/4 dark brown silty loam which contained a moderate amount of brick fragments, calcined clam shell mortar, and one cut nail head. It capped a portion of an in situ brick foundation, Feature 1, and extended into the interior of the feature. Stratum III, a 10YR 4/6 dark yellowish brown silty loam mixed with 10YR 4/4 dark yellowish brown silty loam, contained considerable brick and mortar rubble along the exterior of Feature 1. Artifacts recovered from the fill included cut nails, bottle glass, porcelain buttons, and an iron eye. Based on the quantity of bricks and mortar noted in the stratum, including the presence of several whole bricks, Stratum III probably was formed during destruction of the Feature 1 structure.

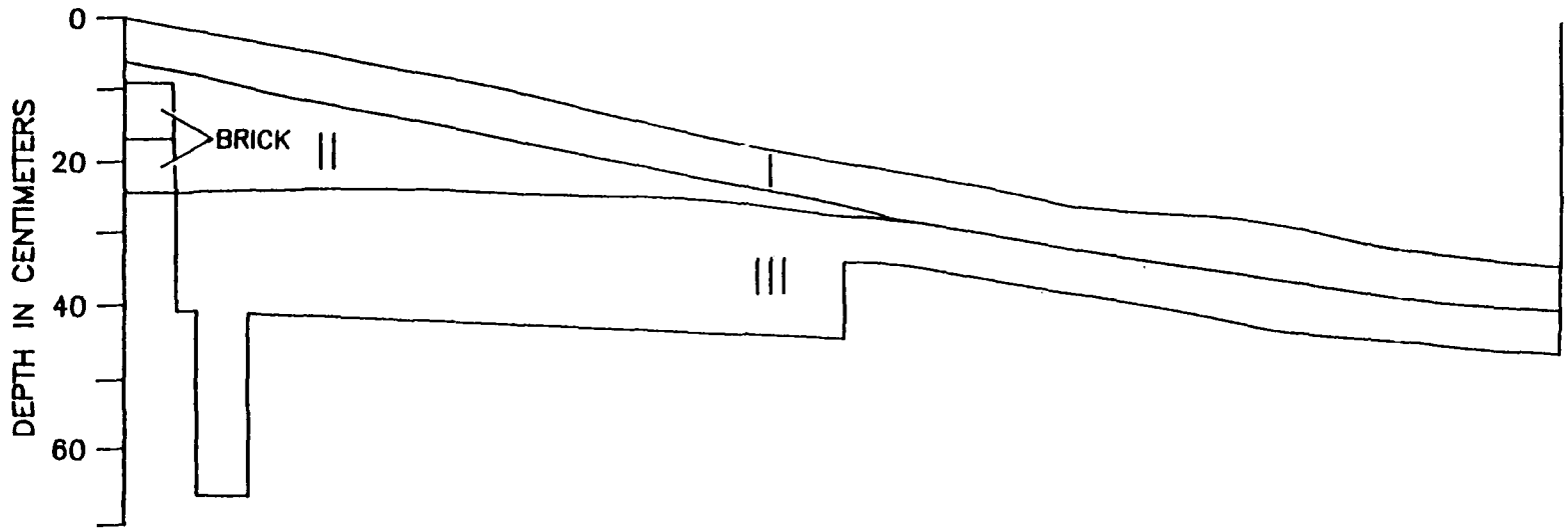
Stratum IV was a 7.5YR 4/6 strong brown clayey silt (Figure 22). It consisted of natural Red River deposits which underlie most of the project area along the bayou, and portions of Strata I, II, and III all rested on Stratum IV. Four ceramic sherds, and one bottle glass, and a few brick and mortar fragments were recovered from the upper portion of Stratum IV. Below the first few cm, however, the stratum did not contain cultural materials or disturbances.

A second unit, Unit 3, was placed 1 m west of Unit 1 to obtain additional data concerning Feature 1. The unit contained three strata; it was positioned to intersect the western edge foundation of Feature 1 (Figure 23). Stratum I was the 10YR 3/2 very dark grayish brown silty loam analogous to the overburden found at Unit 1. Artifacts from Stratum I included cut and wire nails, glass, ceramic sherds, a porcelain button, bricks and brick fragments, calcined clam shell mortar, and some oyster shell fragments.

Stratum II in Unit 3 was very similar to Stratum III in Unit 1. It contained considerable brick (soft mud and fire brick) and mortar rubble in a 10YR 4/4 dark yellowish brown silty loam matrix. Artifacts recovered from the stratum included both cut and wire nails. Stratum III contained 7.5 YR 4/6 strong brown clayey silt representing Red River deposits; it did not contain cultural material. A soil feature, Feature 2, extended into Stratum III; it is discussed below after Feature 1.

Part of an in situ brick foundation, Feature 1, was located near the west end of Unit 1, and at the east edge of Unit 3, within the central mounded portion of Brick Scatter A (Figure 24). The surviving portion of the feature is comprised of two parallel brick walls, each one stretcher wide, connected by a similar perpendicular wall, which includes a three brick high spread footer. The feature, which is oriented perpendicular to Bayou Teche, is 147 cm wide east-west, and greater than 150 cm long north-south. Based on the slope of the mounded area, it is probable the foundation is no more than 200 cm long. It is constructed of soft mud brick bonded with calcined clam shell mortar. The surviving feature included a maximum of four courses of brick, with portions of the foundation within Unit 1 containing only one course.

Data collected during field investigations provide information about the age and the probable function of Feature 1. Artifacts located within the Feature 1 destruction debris,



I: 10YR 3/2 VERY DARK GRAYISH BROWN SILTY LOAM.

II: 10YR 4/4 DARK YELLOWISH BROWN SILTY LOAM.

III: 7.5YR 4/6 STRONG BROWN CLAYEY SILT.

NOTE: THE BRICKS SHOWN ARE PART OF FEATURE 1.

Figure 23. Stratigraphic profile of south wall of Unit 3, at Zenor (16SMY72)

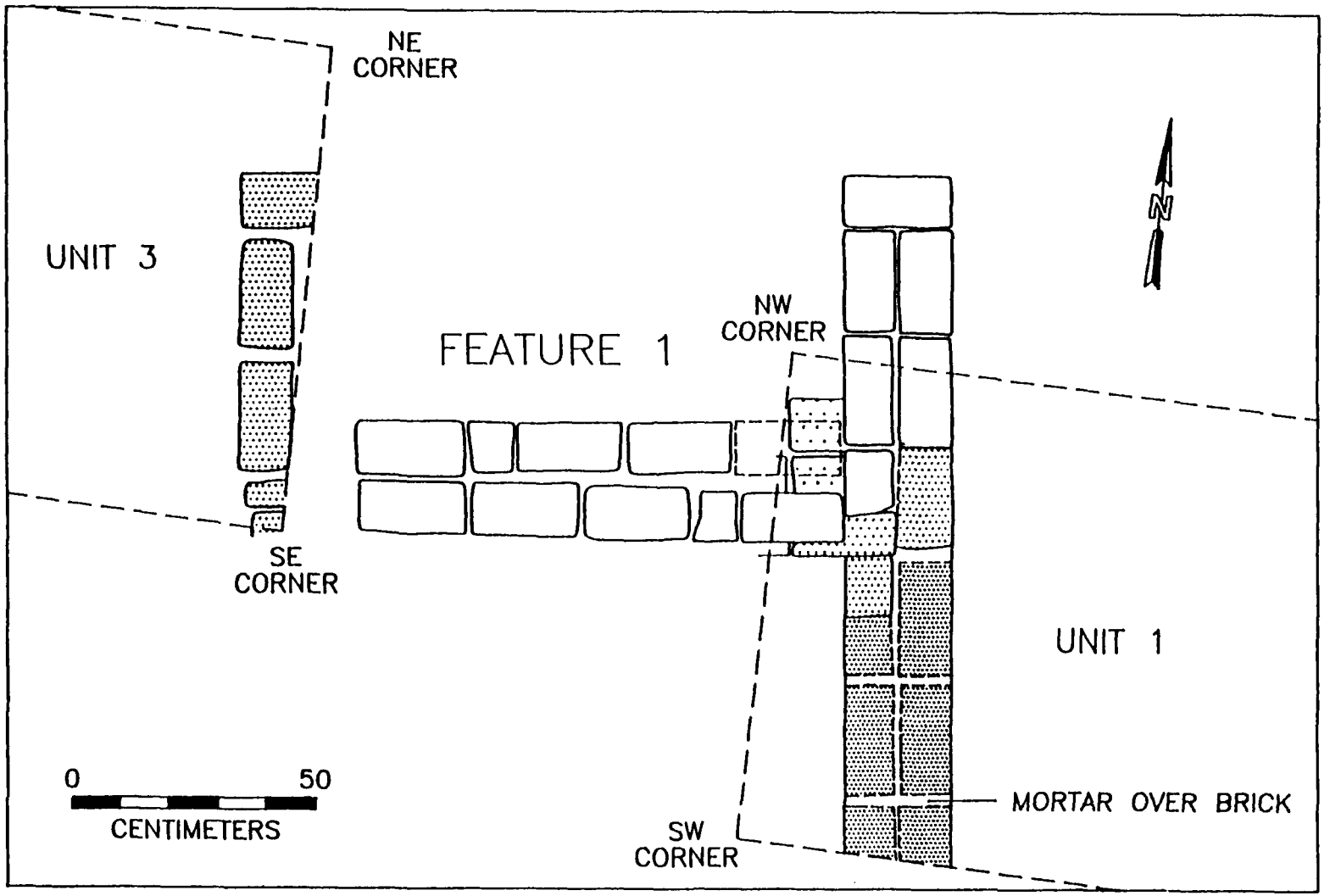


Figure 24. Plan view of Feature 1, at Zenor (16SMY72)

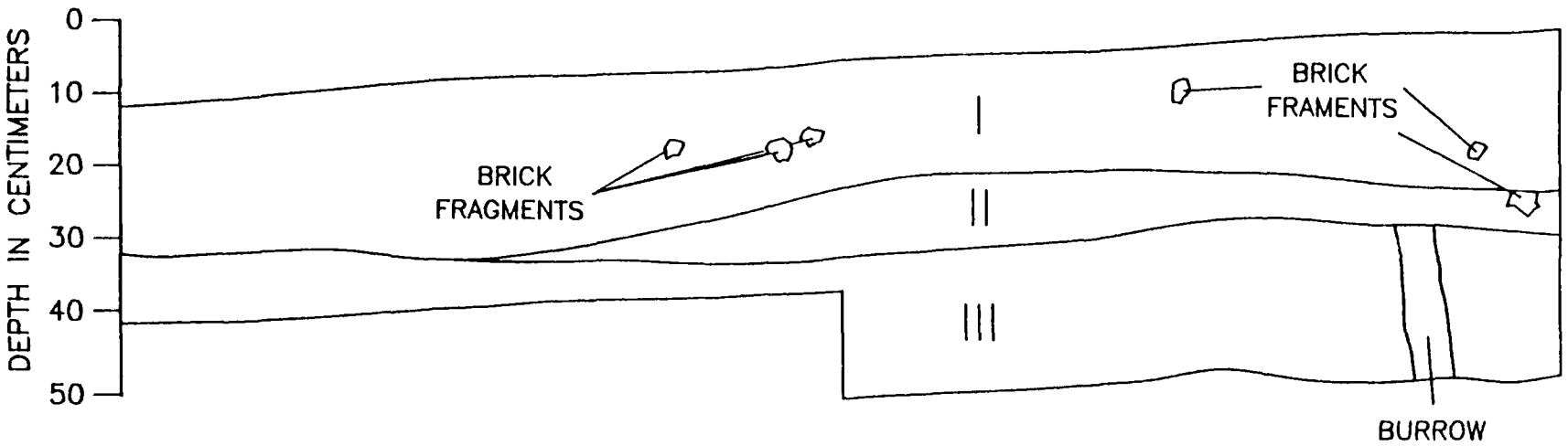
including wire nails and branded fire bricks, suggest that the building was destroyed during the 1920s or 1930s, possibly during the early years of the Great Depression.

The small size of the building, its orientation, and its proximity to Bayou Teche all suggest the building was a pumphouse. In addition, during the riverine survey, a small magnetic anomaly, Anomaly No. 42, was recorded in Bayou Teche, directly in front of Feature 1. This anomaly, which is discussed in Chapter IX, could be the intake end of a pipe system which would have extended from the pumphouse into the bayou. Since rice was grown in the fields north of Segment 1 during the terminal nineteenth to early twentieth century, Feature 1 may have served as the pumphouse associated with a rice field irrigation system. Finally, in 1893, Feature 1 was situated virtually on the property line between land owned by Oscar Zenor and J. Sanders to the west (Figure 13). Placement of rice irrigation water procurement systems along property boundaries appears to have been commonplace in other parts of Louisiana (Goodwin, Hinks et al. 1989; Goodwin, Hewitt et al. 1990); a similar pattern may have occurred with Feature 1.

Feature 2 was a 20 to 22 cm in diameter, roughly circular stain in the south central portion of Unit 3. It extended 22 cm from the top of Stratum III, with nearly vertical sides, and a flat bottom. The feature fill was comprised of 10YR 5/3 brown silt mottled with 10YR 4/4 dark yellowish brown clayey silt. Charcoal fragments clustered along the east side of the feature. A small nail fragment was recovered from the fill. The feature probably represents a posthole or postmold associated with Feature 1. Its precise function and contextual relationship to Feature 1 remain unclear.

Brick Scatter B was located 25 m northeast of Brick Scatter A, and 28 m north of Bayou Teche (Figure 21). The scatter was a 4 m diameter area containing a concentration of brick and oyster shell, toward the north edge of the low ridge adjacent to the Teche. One excavation unit, Unit 2, was placed in the northwest quarter of the scatter to determine better its stratigraphic sequence. This unit was excavated in six levels containing three strata (Figure 25). Stratum I, which was approximately 20 cm thick, contained 2.5Y 3/2 very dark grayish brown silty loam. Numerous historic artifacts were collected from this stratum, including whiteware, yellowware, bottle glass, cut and wire nails, wire, soft mud brick, oyster shell, and some coal.

Stratum II only was present within the southern three-quarters of the unit. It consisted of 10YR 6/3 pale brown silt mottled with 7.5YR 4/6 strong brown clay. It contained moderate quantities of artifacts, including whiteware, glass, nails, a spike, and soft mud brick fragments. Stratum III consisted of 7.5YR 4/4 dark brown clayey silt, Red River deposits. No artifacts or disturbances, other than an animal burrow, were observed in the stratum. Since the upper half of Stratum III was sterile, only the southern half of the stratum was excavated an additional level.



I: 2.5Y 3/2 VERY DARK GRAYISH BROWN SILTY LOAM.

II: 10YR 6/3 PALE BROWN CLAYEY SILT.

III: 7.5YR 4/4 DARK BROWN CLAYEY SILT.

Figure 25. Stratigraphic profile of the east wall of Unit 2, at Zenor (16SMY72)

No features were located within Unit 2. Based on recovered materials, Stratum I apparently represents a twentieth century deposit, possibly from the 1910s through 1930s. Since no in situ deposits were located, and because the brick scatter is not associated with a known historic event, the processes through which the deposits were formed remains unknown.

Brick Scatter C was located 75 m west of Brick Scatter A, adjacent to Bayou Teche (Figure 21). The scatter contained a 7 x 6 m primary brick concentration within a moderate brick scatter measuring 18 x 20 m. Unlike Scatter A, the area was not mounded.

During site testing, additional data were obtained through placement of ten shovel tests across the scatter in the cardinal directions. A typical shovel test, Shovel Test 4, contained 9 cm of 10YR 3/2 very dark grayish brown silty loam overlying 19 cm of 10YR 5/3 brown packed silty loam. The third stratum, 28 through 36 cm, was 7.5YR 4/6 strong brown clayey silt; Stratum III contained sterile Red River deposits. Shovel Test 6, located just north of the ridge adjacent to Bayou Teche, contained a different soil profile: 0 through 7 cm was 10YR 3/2 very dark grayish brown silty loam; 7 through 29 contained 10YR 4/2 dark grayish brown silty loam; and from 29 through 35 consisted of 10YR 4/1 dark gray loamy clay. The bottom excavated stratum was comprised of Mississippi River deposits as opposed to the Red River deposits situated on the ridge. No evidence of in situ features was observed on the ground surface, or within any of the shovel tests.

Artifacts were found only in the upper two strata. Artifacts associated with Brick Scatter C included whiteware, ironstone, gray stoneware, cut nails, bottle glass (including an applied lip), embossed glass, a porcelain button, brick, bone, and coal. One of the whiteware fragments was stamped with a partial "HOMER LAUGHLIN" maker's mark. The assemblage dates from the late nineteenth and early twentieth centuries.

Brick Scatter D is located 80 m east of Brick Scatter A, adjacent to Bayou Teche (Figure 21). It is approximately 15 m in diameter, with an associated artifact scatter which extends an additional 5 to 10 m. A shallow ditch extends 15 m from the Teche northward through the center of the scatter.

During site testing, the center of the scatter was located, and four rays were established radiating from that point. Eighteen shovel tests spaced at 5 m intervals were excavated along these rays to define the limits and contents of the scatter, to ascertain the soil stratigraphy within the scatter, and to locate any in situ deposits. Shovel Test 1 within Ray 1, at 5 m from the center, contained a typical soil profile of 10 cm of 10YR 3/3 dark brcwn silty loam overlying 20 cm of 7.5YR 4/6 strong brown silty loam (Red River deposits). A small number of artifacts was recovered from the upper portion of 10 of the excavated shovel tests. These artifacts included undecorated and hand painted whiteware, glazed redware, clear and green glass, cut and wire nails, soft mud brick fragments, and some calcined clam shell mortar. The assemblage dates from the late

nineteenth to early twentieth centuries. No evidence of in situ features or deposits was observed in any of the shovel tests.

Because of the lack of in situ features, the original function of the Brick Scatter D deposits remains unknown. Although the ditch within the scatter suggests a water procurement function, its proximity to the contemporaneous Brick Scatter A foundation casts doubt on this interpretation.

Segment 2

Segment 2 was situated immediately westward from Segment 1, in open woods and lightly wooded pasture on the modern North Luckland Farms (Figure 1). During initial survey of Segment 2, 95 shovel tests were placed across the segment. Eighty-five contained historic artifacts (Figure 26). One historic site, Luckland Plantation (16SMY71), was recorded; it comprised the entire segment.

Two typical soil profiles were observed within the segment. Transect 2, Shovel Test 4 had a soil profile typical of the north part of the segment. This shovel test contained 4 cm of 10YR 3/2 very dark grayish brown silty loam overlying 25 cm of 10YR 4/2 dark grayish brown silty clay. The basal stratum, between 29 and 36 cm, was 10YR 4/1 dark gray silty clay. This lower stratum contained undisturbed Mississippi River deposits laid during formation of the Bayou Teche lobe (see Chapter II).

Transect 5, Shovel Test 7, contained a typical soil profile for the southern half of the segment. Within this shovel test, the upper 10 cm contained a 10YR 3/3 dark brown clayey silt; 10 through 30 cm was a 10YR 4/3 dark brown sandy silt; and the bottom excavated stratum, Stratum III (30 to 40 cm), was comprised of 7.5YR 4/6 strong brown clayey silt. Stratum III contained the Red River deposits common along much of the Teche.

A wide variety of artifacts was observed and recovered during the initial pedestrian survey and shovel testing of Luckland Plantation. These artifacts included pearlware; whiteware, including undecorated, annular, molded, and transfer printed; yelloware; porcelain; window, bottle, and table glass; lamp glass; cut and wire nails; a bolt; iron wire; a clay marble; bricks and brick fragments (soft mud, stiff mud, fire bricks); and roofing slate. Slag, coal, coal cinders, charcoal, bone, gravel, oyster shell, and *Rangia cuneata* also were observed and collected within the site. Most of the artifacts date from the postbellum period and the early twentieth century, corresponding to the post-Civil War occupation and development of Luckland Plantation. However, a number of the recovered artifacts, such as the cut nails, much of the whiteware, and some bottle and window glass fragments, are not very diagnostic, still a few materials such as pearlware, represent antebellum artifacts. Therefore, it is probable the antebellum occupation of the

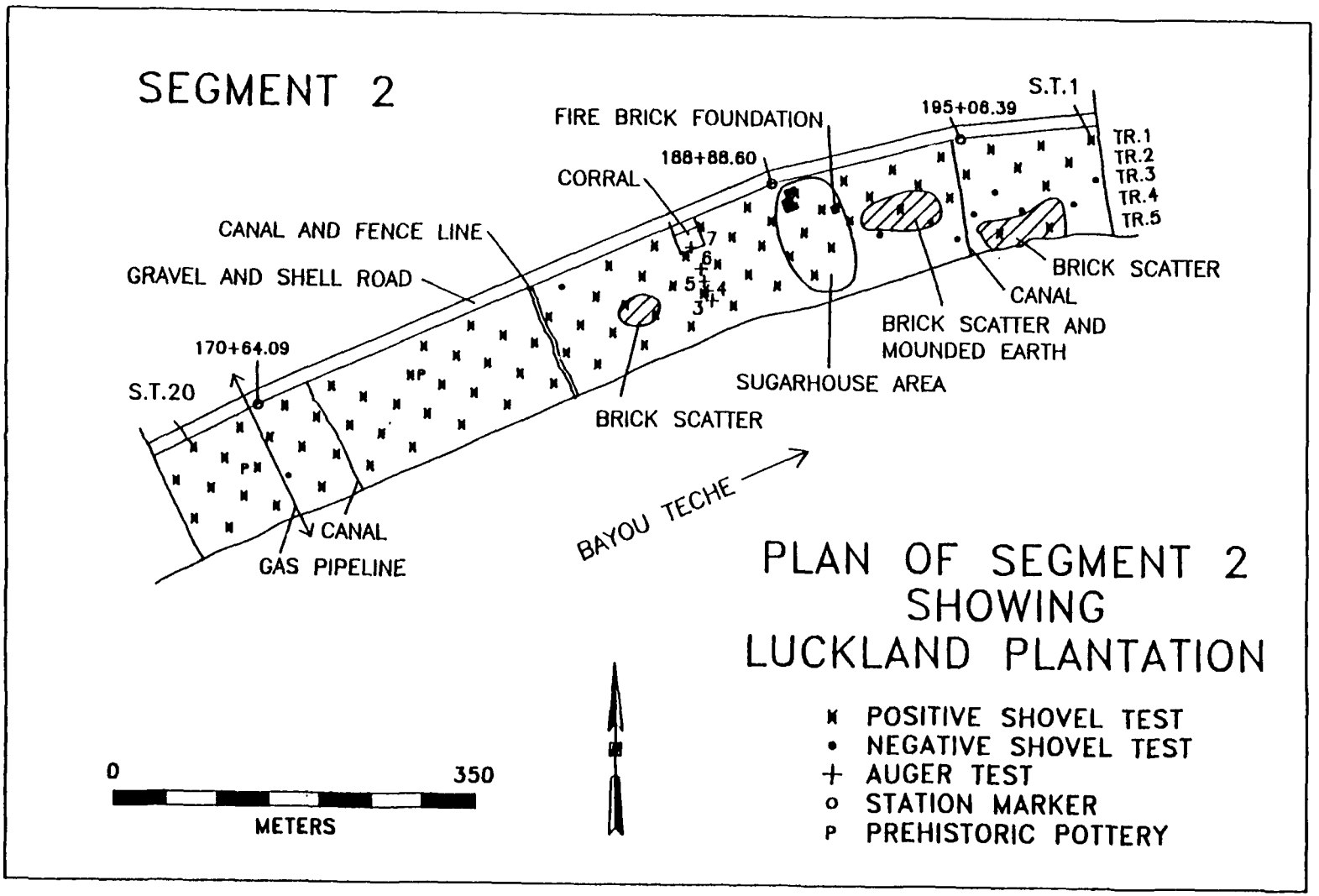


Figure 26. Plan of Segment 2, showing Luckland Plantation (16SMY71)

general area largely is masked by the more extensive, longer post-Civil War occupation of Luckland Plantation.

One small prehistoric sherd was recovered in Segment 2, from Transect 2, Shovel Test 15. This undecorated sherd was not associated with any observed in situ prehistoric deposits. While not confirmed, the lack of additional prehistoric materials suggests the sherd is an isolated find.

The remains of the Luckland Plantation sugar house were observed within the site (Figures 26 and 27). These remains included the large grinder foundation at the north end of the sugar house, brick foundations, piers, and machinery mounts. The grinder foundation is measured 6.1 m north-south by 8.65 m east-west, and has three arched tunnels running east-west through the lower half of the 1.9 m high structure. Much of the southern third of the foundation has been damaged considerably by heavy machinery such as a bulldozer. An associated 2.15 m north-south by 8.35 m east-west machinery mount, also 1.9 m high, is situated 0.5 m north of the grinder foundation.

Numerous in situ sugar house foundation remains are visible throughout a 35 x 40 m area south of the grinder foundation (Figure 27). These remains suggest that the sugar house was a multi-roomed frame structure constructed on brick foundations and piers. At least a portion of the building featured wood floors constructed on wooden beam floor joists. Other portions may have had concrete floors. The semi-circular north and south ends of a probable oval brick foundation is located at the southwest end of the sugar house; the function of this feature, which could be two adjacent circular foundations has not been determined. While most of the visible remains are constructed of soft mud brick, two large machinery mounts are constructed of cement with crushed brick filler. Also, a large fire brick pier is located toward the southern end of the sugar house. Branded bricks within that pier include "MISSOURI/XXX" and "P. R. M. & M. CO./NO. 1." The latter bricks were manufactured by the Parker-Russell Mining and Manufacturing Company, in Missouri. As with the "MISSOURI/XXX" brand, this brand was used at least during 1927 through 1930 (Gurcke 1987:282-283). This suggests the sugar house operation continued to expand in the 1920s, until the Great Depression.

A 6.2 m x 4.5 m foundation constructed of fire brick stretchers, on edge, is located approximately 30 m east of the sugar house, on a different orientation (Figure 27). The visible foundation is one stretcher wide at ground surface; its southern corner is not visible. It is constructed, at least partially, from bricks branded "P.R.M. & M. CO./NO. 1." Therefore, the structure probably was constructed during the 1920s, prior to the Great Depression.

A third foundation segment is located 13 m southeast of the sugar house remains, surrounding part of a rectangular depression (Figure 27). The visible foundation is located along the west side of the depression, which is partially filled with modern debris. An earthen berm extends south from this depression and foundation and continues to rise

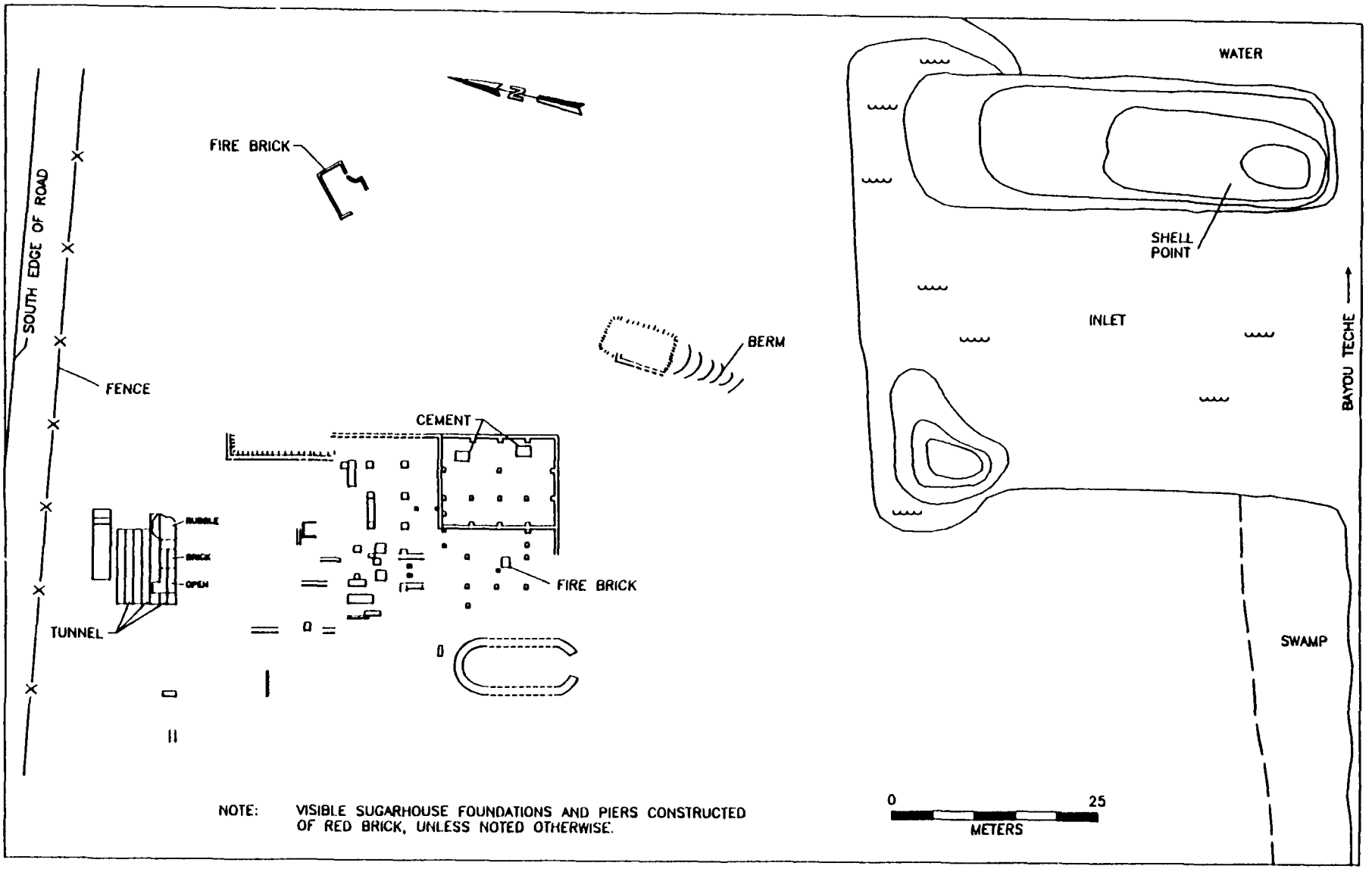


Figure 27. Plan view of sugar house foundation remains and associated features at Luckland Plantation (16SMY71)

at the edge of an inlet from Bayou Teche. This earthen pile, which was part of the Luckland Plantation landing, is covered with a moderate amount of modern debris.

A 50 m long north-south by 15 m wide east-west shell area was located 60 m southeast of the sugar house, within the inlet, or slip. It was comprised of mounded *Rangia cuneata* and oyster shells, surmounted with several pieces of utilized lumber. Based on the riverine survey (discussed in Chapter IX), the point probably represents the remains of a shell filled barge which formed the secure anchoring point for a bridge across the Teche. This interpretation is buttressed by a 1930 aerial photograph of the bayou, which shows the plantation bridge crossing located along the east side of the point. In addition, a 1935 U.S. Army Corps of Engineers plan of Luckland Plantation depicts a bridge crossing Bayou Teche directly southeast of the sugar house (Figure 17).

The low, partly wet land immediately west of the inlet is constructed of 15 to 20 cm of *Rangia cuneata* shells. These shells formed a firm base for landing activities along the Teche. The 1930 aerial photograph shows a large rectangular building in this area, which may have served as a warehouse or storage area. It is unclear whether or not they served any other function.

A few other large brick scatters were observed on Luckland Plantation (Figure 26). A 75 m long scatter is located adjacent to Bayou Teche, at the east end of Segment 2. It includes at least some in situ brick. A second scatter, including two somewhat mounded brick areas, is located 50 m east of the sugar house. A third scatter is situated near Shovel Test 10 of Transect 4, and Shovel Test 11 of Transect 3; some of the brick is in situ. All of these probably are foundation remains of Luckland Plantation structures.

A late nineteenth to early twentieth century shed is standing southwest of the sugar house remains. The original part of the structure is a one-room frame shed with an elevated floor, a front doorway (west side) and opposite side doorways, and clapboard siding, all resting on corner wooden pilings. A wrap-around enclosed shed addition was added to the north, west, and south sides of the shed, forming a modified Acadian shed. Although it remains standing, the building is in deteriorated condition.

Both a 1930 aerial photograph of the project area, and a 1935 U.S. Army Corps of Engineers plan of Bayou Teche depict the structures on Luckland Plantation (Figures 17 and 18). These figures show several large structures around the plantation sugar house, along with a circular road, and the previously mentioned bridge. Over 30 structures are depicted within the Luckland Plantation vicinity, most of which are located within the Segment 2 project area. Most of these structures are located along the crest of the Bayou Teche natural levee, extending in a line parallel to the Teche, on either side of the landing area. The landing area, with its sugar house and associated non-residential structures, is located on the crest of the natural levee, and between this natural levee crest and the bayou. The 1941 topographic quadrangle shows only 13 structures within Luckland Plantation, north of the Teche. The deterioration of the plantation complex

continued through the 1950s and 1960s. The 1954 USGS topographic quadrangle depicts only 11 surviving structures in the complex; by the mid-1960s, only two buildings remained, both within the landing area. Currently, one historic Acadian shed, and one mid-twentieth century farm machinery storage shed survive north of Bayou Teche at Luckland Plantation; both are at the landing area, a short distance west of the sugar house remains.

Segment 3

Segment 3 is located directly west of Segment 2, in wooded pasture, overgrown fields, and woods (Figure 1). During pedestrian survey and shovel testing of Segment 3, 110 shovel tests and six auger tests were excavated. A total of 68 shovel tests and one auger test contained cultural materials (Figure 28). One historic site, Avalon Plantation (16SMY70), which also includes a small prehistoric component, was recorded. This site encompassed the entire segment.

Soil profiles within the segment were very similar to those observed in Segment 2. Transect 1, Shovel Test 23 exhibited a typical soil profile for the northern edge of the segment. It contained 8 cm of 10YR 2/2 very dark brown clayey silt overlying 12 cm of 10YR 5/3 brown clayey silt. The basal stratum, from 20 to 44 cm, was a 10YR 4/2 dark grayish brown clayey silt. It consisted of undisturbed Mississippi River deposits.

Transect 3, Shovel Test 12 contained a typical soil profile for the southern portion of the segment. The upper 14 cm contained 10YR 3/3 dark brown silty loam; between 14 and 43 cm bs, a 7.5YR 4/6 strong brown clayey silt was present. The basal stratum was undisturbed Red River deposits.

Numerous historic artifacts were recovered from the shovel tests placed across Avalon Plantation. These included whiteware (undecorated, transfer printed, flow blue); yelloware; domestic brown and gray stonewares; porcelain; bottle and window glass; table glass; lamp glass; cut and wire nails; bricks and brick fragments (soft mud, stiff mud, fire bricks); and calcined clam shell mortar. Coal, coal cinders, charcoal, slag, bone, gravel, oyster shell, and *Rangia cuneata* also were observed. These artifacts generally date from the postbellum and early twentieth centuries, corresponding to the post-Civil War occupation and development of Avalon Plantation. Some of the artifacts may date from the antebellum period; however, the extensive postbellum occupation of the plantation has masked most of the earlier plantation remains.

A small prehistoric shell midden was located near the center of Segment 3. Transect 2, Shovel Test 14 produced a stratigraphic profile of 10 cm of 10YR 2/1 black silty loam overlying 30 cm of 10YR 3/3 dark brown clayey silt. These upper two strata contained bottle glass, a glass stopper, brick, shell, and coal. Between 40 and 48 cm was an intact *Rangia cuneata* shell midden in a 10YR 3/1 dark gray silty clay matrix. Six

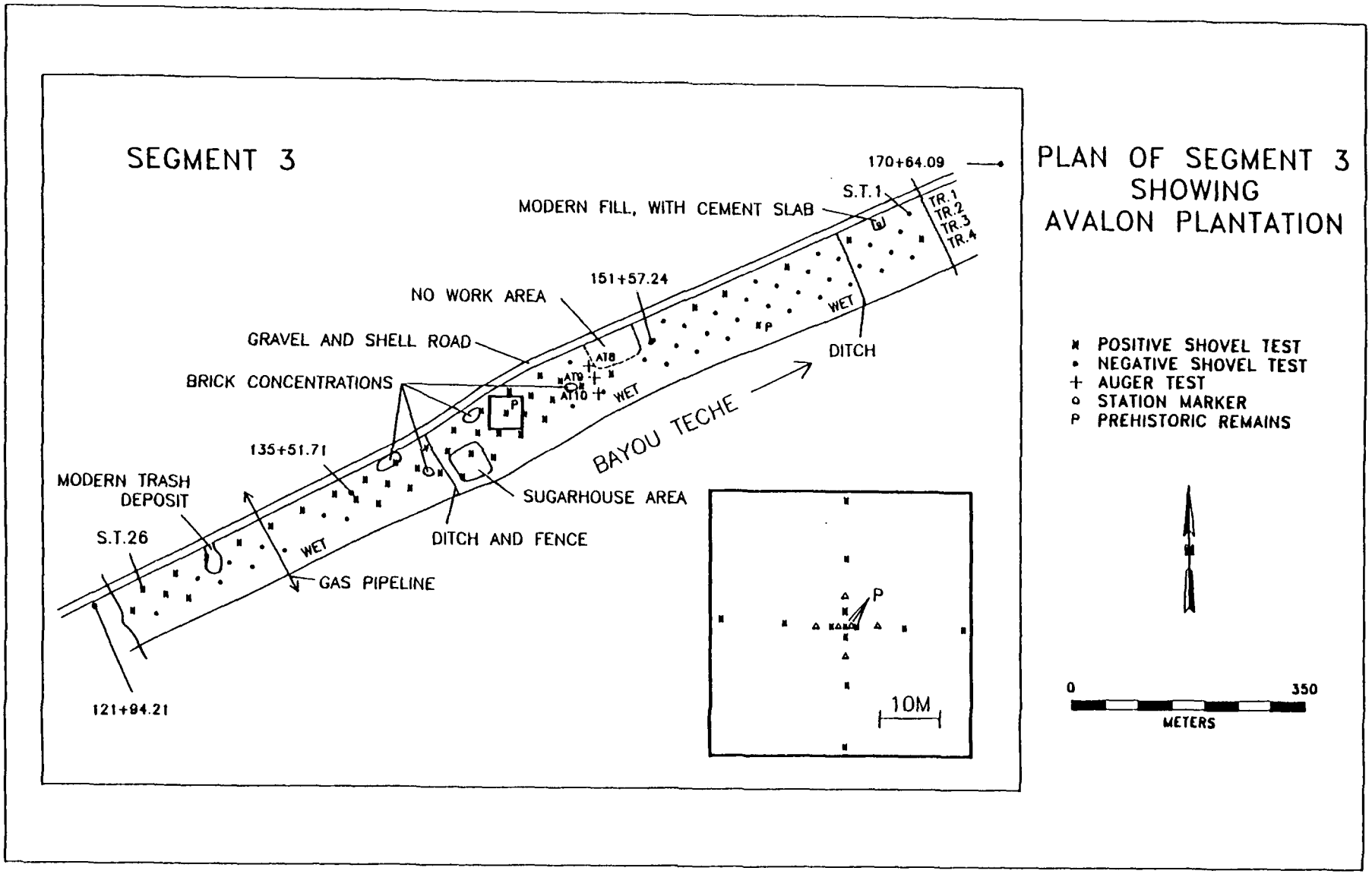


Figure 28. Plan of Segment 3, showing Avalon Plantation (16SMY70)

prehistoric pottery fragments were recovered from the shell midden. The basal stratum, from 48 to 60 cm, contained 10YR 4/1 dark gray silty clay; no cultural materials were recovered from it.

Twelve shovel tests and six auger tests were excavated near the shell lens to determine the extent and nature of the midden (Figure 28). Shovel tests were excavated at intervals 20 m, 10 m, and 2 m from Transect 2, Shovel Test 14; auger tests were placed at 5 m and 1 m from it. While historic cultural materials were recovered from all of the shovel and auger tests, only three tests contained any evidence of prehistoric deposits. The auger test placed 1 m east of Transect 2, Shovel Test 14 contained shell midden between 45 and 52 cm; however, no prehistoric artifacts were recovered from it. The auger test placed 1 m west of origin contained 2 to 3 *Rangia cuneata* shells at about 35 cm. Finally, the shovel test placed 2 m east of the origin contained one prehistoric pottery sherd but no evidence of a shell midden. The entire shell midden is approximately 1 m north-south by 2 m east-west; it is up to 8 cm thick. The shell midden appears to be in situ with a few associated artifacts extending a short distance beyond the edge of the midden.

The historic remains identified within Segment 3 are associated with Avalon Plantation. The historic resources located in excavated shovel tests (Figure 28) corresponds well with historic plans of the plantation (Figures 16 and 17). These historic plans depict the eastern third of the segment as unoccupied land with no standing structures. Correspondingly, the east third of Segment 3, from the small No Work Area eastward, contained only a few scattered historic artifacts. In addition, while the rest of the segment included both industrial and residential structures, within the western third most of these structures were situated along the shell and gravel road. Likewise, most of the artifacts located within the western third of Avalon Plantation were recovered near the road.

The remains of the Avalon Plantation sugar house were observed near the center of the segment (Figures 28 and 29). Visible in situ remains included the large grinder foundation, brick foundations, and machinery mounts. The 1.9 m high grinder foundation measures 7.21 m north-south by 11.82 m east-west; it includes three east-west arched tunnels, along with four smaller north-south tunnels. Most of the foundation is constructed of soft mud bricks, and several cut nails are driven into it. However, the western end of the south face is a facade addition constructed of stiff mud bricks; several wire nails protrude from this addition (Figure 29). While the main foundation probably dates from the postbellum period, the facade was constructed during the twentieth century. An associated 1.9 m high machinery mount is located 0.5 m north of the grinder foundation; its dimensions are 1.86 m north-south by 9.81 m east-west.

Other in situ sugar house remains are located around these foundations. Most of four exterior foundation walls are visible around the grinder foundation, forming a probable building size of 14 x 34.5 m. A 1.9 m high machinery mount is located 9 m west

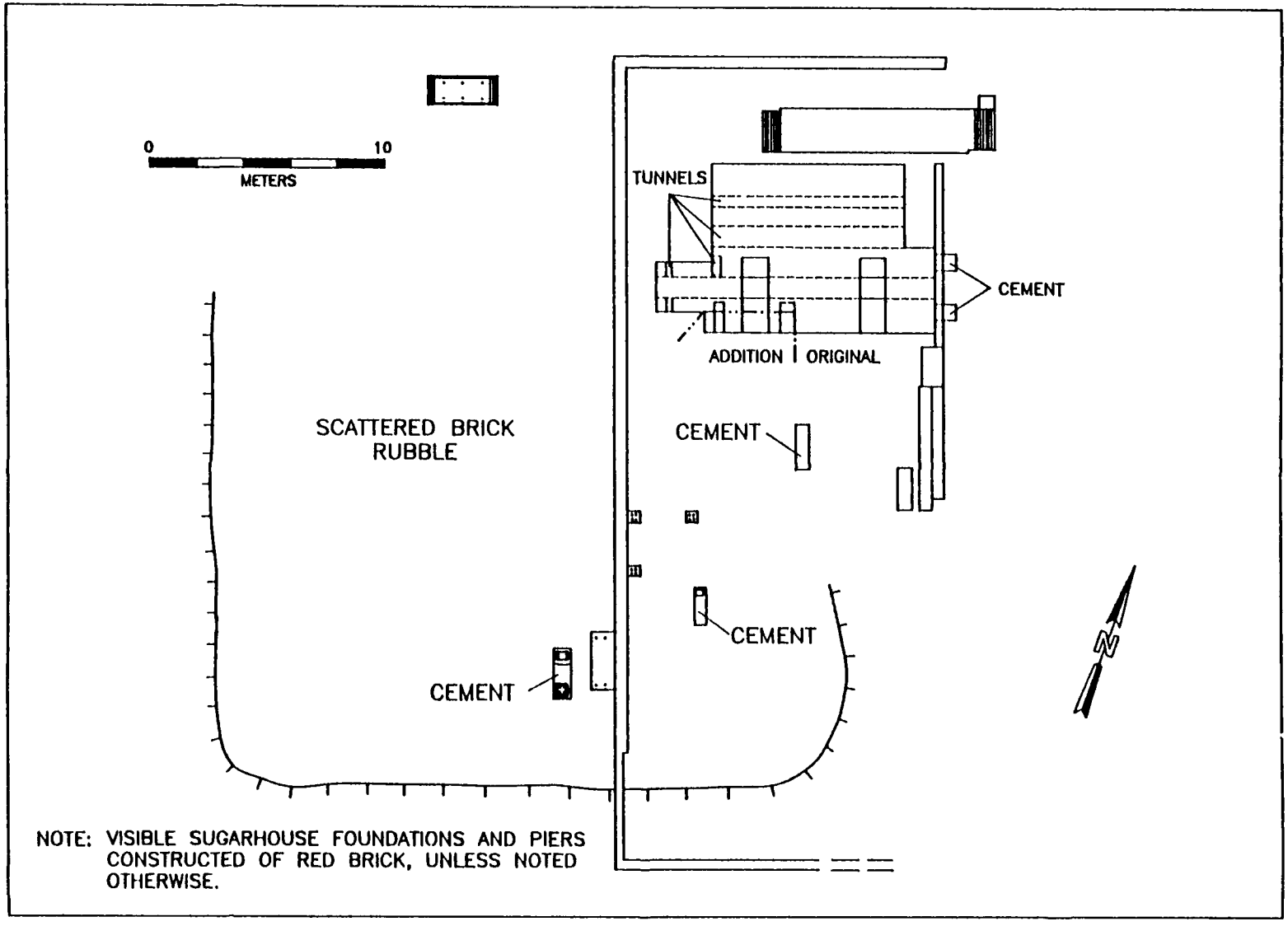


Figure 29. Plan view of sugar house foundation remains and associated features, at Avalon Plantation (16SMY70)

of the grinder foundation, while eight smaller mounts, both brick and cast cement, are situated south of it (Figure 29). While the surrounding natural terrain slopes gradually towards Bayou Teche to the south, the south end of the sugar house remains approximately 17 m to the west, and is raised above the natural slope. This raised area is covered with scattered brick rubble.

Based on available historic documentation, the Avalon Plantation sugar house was comprised of two adjacent large structures, with several smaller structures surrounding them (Figures 16 and 17). Most of the visible remains probably are part of the eastern building, while the raised area covered with scattered brick rubble marks the location of the western building. A ca. 1910 through 1920 photograph of the Avalon Plantation sternwheeler *PERI* was taken with the vessel docked in front of the Avalon sugar house (Figure 19). It shows the upstream portion of the sugar house as a large frame building with a monitor roof, one visible window on its west side, and a door or large opening. The monitor roof of an adjacent building, probably the east side sugar house building, is visible behind one of the boat's smokestacks. The Avalon Plantation smokestack is visible behind the sugar house.

A few additional brick concentrations were observed within Avalon Plantation (Figure 28). Two of these were located along Transect 1: one 50 m north of the sugar house area, and the other 100 m to the west. A third was located between Transects 2 and 3, about 50 m west of the sugar house remains. A fourth was situated in the vicinity of Transect 3, Shovel Test 12. While in situ foundations or piers were not observed at any of these, each probably marks the location of a razed Avalon Plantation structure.

As discussed in Chapter V, processing of sugar cane at the Avalon Plantation sugar house ceased by 1923. During the next several decades, the Avalon Plantation residential and industrial complex surrounding the sugar house and landing deteriorated. The 1920 plan of the plantation area depicted 36 structures, including tenant housing, outbuildings, sugar house, wharf, and bridge (Figure 16). Their arrangement was similar to that at Luckland Plantation (16SMY71), with most of the domiciles aligning Zenor Road, and the farm and sugar production structures clustered around the landing. All of these structures, except for one building, are shown on the 1930 aerial photograph of the property (Figure 18). However, only eight of these structures are located on the 1941 USGS topographic quadrangle. The 1954 USGS topographic quadrangle depicts only five structures remaining, including three near the landing, and two at the west end of the property. These five structures were razed by the mid-1960s. No standing structures currently are located on the property, which is covered with woods, wooded pasture, and overgrown fields.

Segment 4

Segment 4 is located in overgrown woods west of Segment 3, between the shell and gravel road and Bayou Teche (Figure 1). The eastern 150 m of the segment is within a fenced landing facility. Much of this was a No Work Area, while the rest was not tested either because of restricted access, or due to considerable disturbance observed within the facility. Therefore, testing began immediately west of the modern landing. Transect 1 was located approximately 15 m south of the north edge of the segment in order to avoid a broad, shallow, water-filled ditch that extended parallel to the road for most of the segment. The area south of Transect 3 was swampy and covered with woods.

A total of 39 shovel tests were excavated within Segment 4; cultural materials were recovered from seven of these shovel tests (Figure 30), including a few brick fragments, a nail fragment, *Rangia cuneata* shell. and an isolated prehistoric sherd. In addition, modern debris was observed at Transect 1, Shovel Test 8, in an area of modern disturbance containing the remains of a building that stood in the area until the 1960s. The brick fragments observed in the three shovel tests southeast of the modern disturbance probably derive from the modern bridge that spanned the bayou in this area until ca. 1970.

Transect 2, Shovel Test 3 exhibited a typical soil profile for the segment. Within this shovel test, the upper 6 cm was a 10YR 4/2 dark grayish brown silty loam; 6 through 20 cm contained 10YR 5/3 brown clayey silt; and 20 through 35 cm was comprised of 7.5YR 4/6 strong brown clayey silt (Red River deposits).

A small slip, along with an associated U-shaped ridge to the immediate north, was located during the terrestrial survey. The slip is approximately 18 m long and 6 to 8 m wide. It is aligned on either side with 0.75 m high spoil banks, which extend 5 to 6 m into the Teche. Beyond the spoil ridges lie swampy and wet areas covered in woods. The U-shaped ridge is 20 to 25 m long and 8 m wide. Its south edge is 4 m north of the slip. Only one small brick fragment was recovered from shovel tests placed near the slip. No other artifacts were located near the slip. The slip is visible on a 1930 Corps of Engineers aerial photograph of the area, with a small boathouse or similar structure at its head, and an unimproved road leading from the slip to a twentieth century road and bridge located 150 m west of the slip. The small structure was destroyed prior to the mid-1940s. No other substantive archeological resources were located during survey of Segment 4.

Segment 5

Segment 5 is situated in woods and a in canefield directly west of the southern half of Segment 4 (Figure 1). The southern half of Segment 5 is wooded and most of it is inundated. The northern half is the edge of a canefield. During initial pedestrian survey and shovel testing of the segment, 37 shovel tests were excavated. One archeological

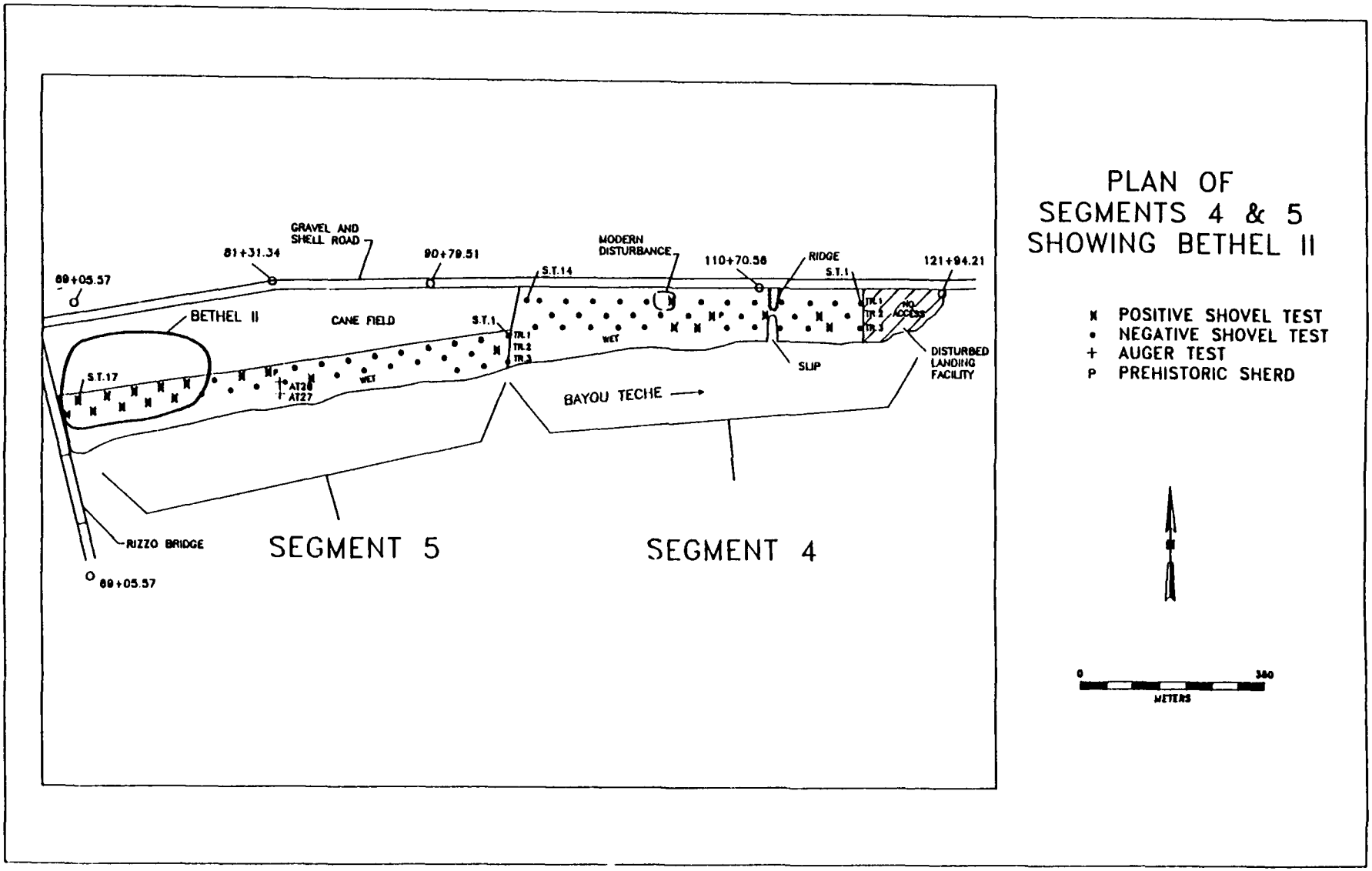


Figure 30. Plan of Segments 4 and 5, showing Bethel II (16SMY69)

site, Bethel II (16SMY69) was located. This site was confined to the western 275 m of the segment.

Transect 2, Shovel Test 15 contained a typical soil profile. The upper 31 cm were comprised of a 10YR 4/3 dark brown silty loam plowzone. The basal stratum, 31 through 42 cm, was a 10YR 4/2 dark grayish brown silty loam, possibly Mississippi River deposits. In some tests, however, such as Transect 1, Shovel Test 7, the bottom stratum comprised 7.5YR 4/6 strong brown clayey silt, i.e., Red River deposits.

East of Bethel II, only four of the excavated 29 shovel tests contained cultural materials. These included scattered brick fragments and one isolated prehistoric sherd. Within Bethel II, all ten of the initial shovel tests produced brick fragments. In addition, brick fragments, glass, and historic ceramics were observed throughout the Bethel II site area.

Based on the observed cultural materials within Bethel II, additional testing was performed to ascertain better its extent and cultural affiliation. Twenty-three additional shovel tests were excavated in the site area; the site was examined visually to delineate site boundaries; a sample of observed artifacts was collected; and a site plan was prepared (Figure 31). The site is approximately 150 m north-south by 275 m east-west. While a moderate amount of brick was observed throughout the site area, three areas were observed to contain higher concentrations of brick. Of these, one included a number of glazed bricks (Figure 31).

A thin scatter of historic ceramic sherds and glass covered the site area. However, two areas contained higher concentrations of non-brick artifacts. One, situated towards the eastern end of the site, contained a concentration of antebellum ceramic sherds, including pearlware, whiteware, and cream colored earthenwares. An estimated 90 per cent of the observed sherds were decorated with transfer printing or hand painted designs, including green and blue shell edged wares, other embossed and edged wares, and blue willow pattern. Vessel forms included plates, bowls, cups, and chamber pots.

The western 100 m of the site contained a moderate concentration of postbellum and early twentieth century artifacts, including late period whitewares, ironstone, yelloware, and tooled bottle lips. These artifacts were scattered throughout the western 100 m of the site; no substantive concentrations were observed.

Based on observed artifacts, Bethel II includes two components: an antebellum component within the eastern 100 m, and a post-Civil War component within the western 100 m. These components probably overlap. The bulk of the site, including the concentration of antebellum ceramic sherds, is located north of the proposed dredged material disposal area.

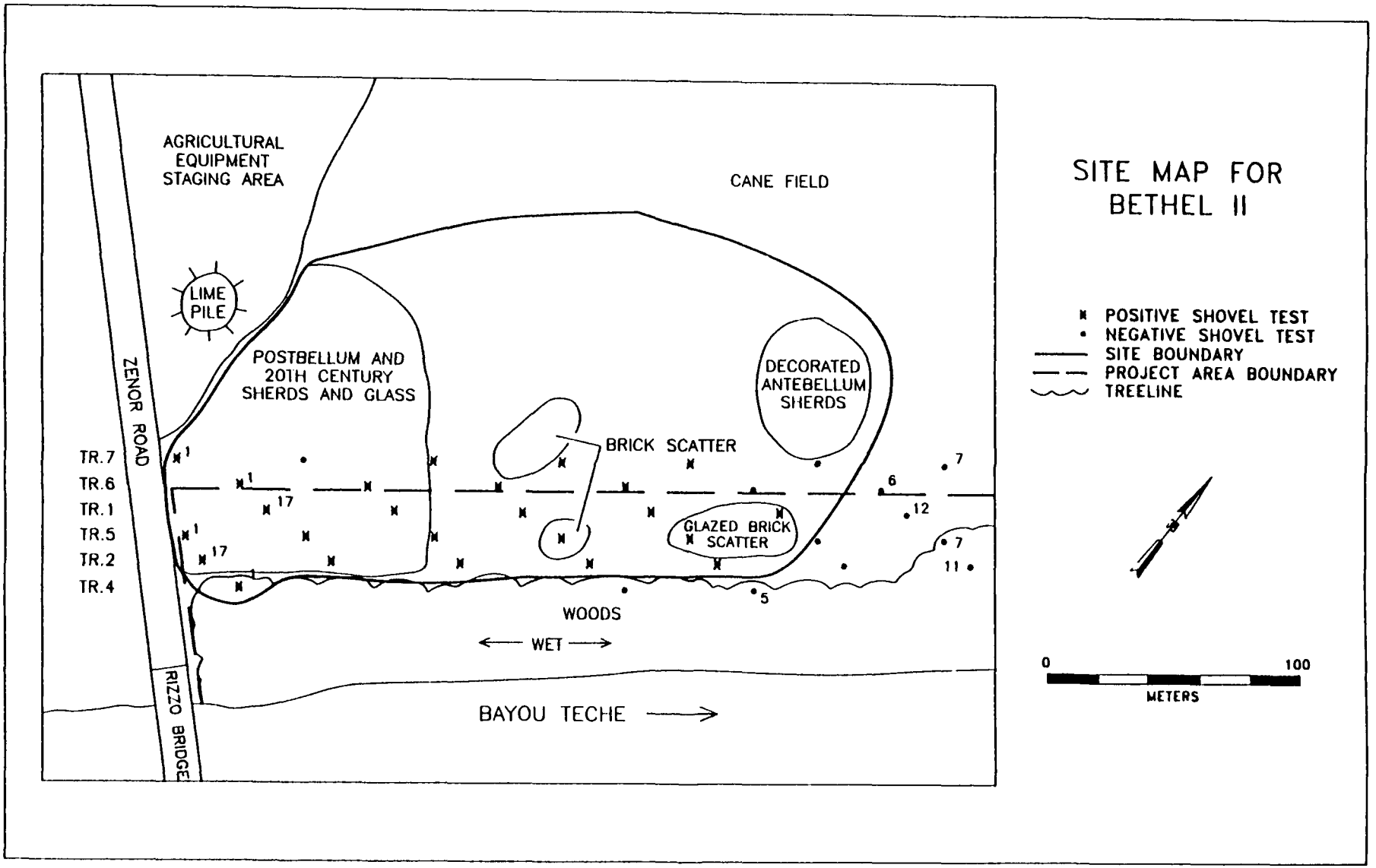


Figure 31. Site plan of Bethel II (16SMY69)

Segment 6

Segment 6 is located on the left descending bank of Bayou Teche, in dense woods south of the cultivated cane fields (Figure 1). During pedestrian survey and shovel testing, 110 shovel tests and 17 auger tests were excavated within the segment along the established grid system (Figure 32). One historic archeological site, Bethel I (16SMY68), was identified within the segment.

Bethel I is situated on the natural levee ridge along Bayou Teche; a portion of the site extends to the base of that ridge. The western half of the site is the larger component; the site boundaries were extended eastward 100 m to incorporate the remains of a narrow gauge railway bed oriented perpendicular to the Teche. Within the Bethel I site boundaries, 50 (68 per cent) of the excavated 74 shovel tests contained cultural materials. Forty-five (79 per cent) of the 57 shovel tests placed within the main part of the site contained artifacts. Outside of the site, only one (3 per cent) of the 36 excavated shovel tests contained artifacts, and that was a brick fragment recorded near Zenor Road. All of the auger tests were negative.

A variety of artifacts were recovered from shovel tests placed within Bethel I. These included whiteware, domestic brown stoneware, porcelain, bottle and window glass, pressed glass, and cut nails. Soft mud brick, *Rangia cuneata* shell, oyster shell, coal, and charcoal also were observed. These artifacts generally were not diagnostic beyond a general nineteenth century designation.

Scattered bricks and brick fragments were observed throughout most of the western half of the site (Figure 32). These bricks were more concentrated on the ridge north of N640, but they also were observed in the lower areas adjacent to the inundated woods by the Teche. No in situ brick features were observed on the ground surface, or within any of the shovel tests placed in the site.

Remains of a narrow gauge railway bed were observed at the east end of Bethel I. It had a maximum height of 20 to 25 cm, and it was no more than 3 m wide. The rise was oriented perpendicular to Bayou Teche, and was visible from the northern edge of the woods most of the way to the bayou. One bent narrow gage iron rail was observed on top of the rise. The railway is aligned with a dock depicted on the 1870 C.W. Howell map of Bayou Teche (Figure 11). In addition, Anomaly #10, identified during the riverine magnetometer survey, and discussed in Chapter IX, is situated in Bayou Teche, directly in line with the railway. The railway probably pre-dates 1870, and was used to transport commodities to and from a dock extending into Bayou Teche.

A metal detector survey was conducted along every other survey transect. This survey was designed to locate subsurface concentrations of metal. Locations of metal readings were plotted on the site map (Figure 32). All of the readings occurred within the

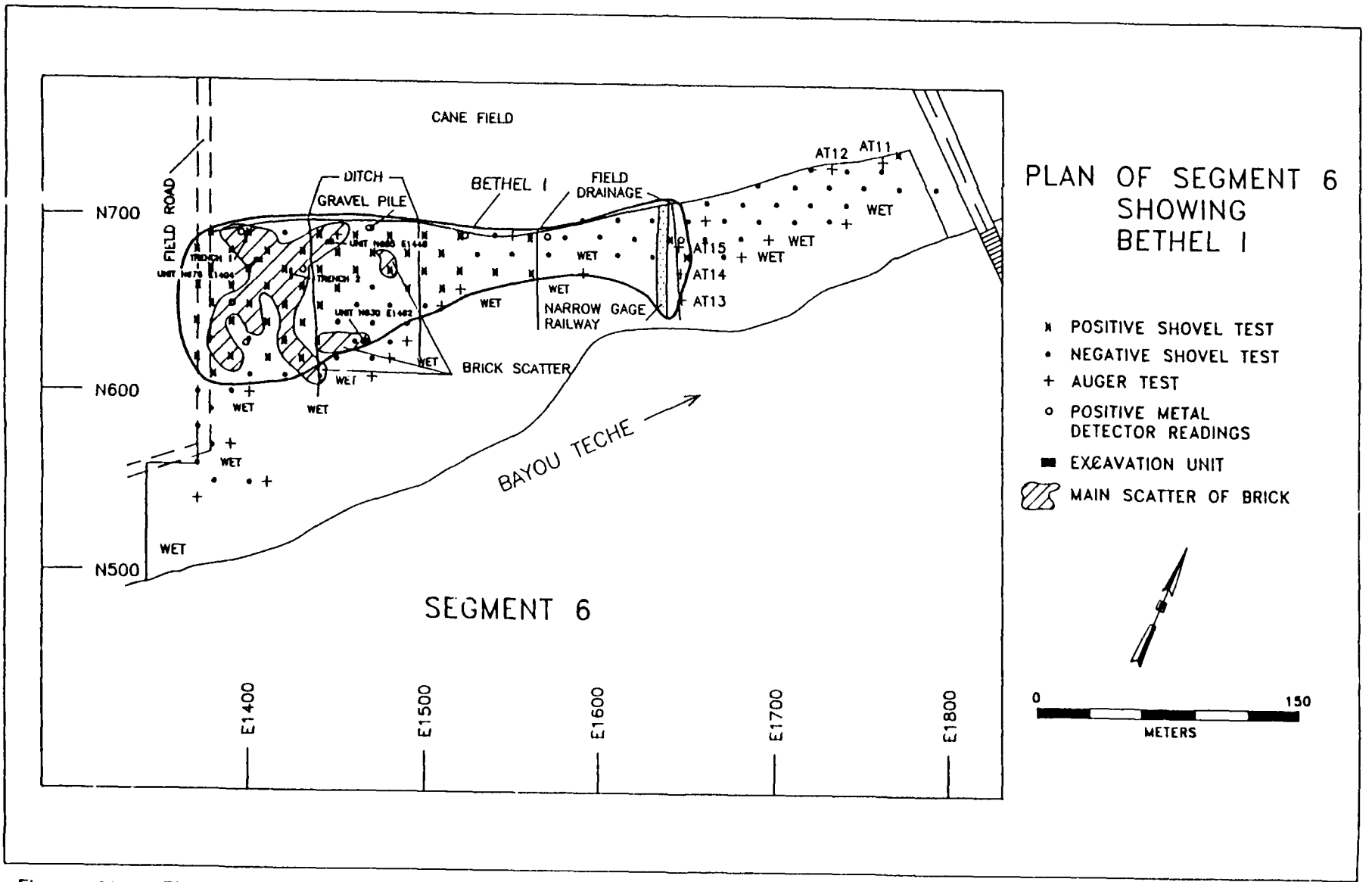


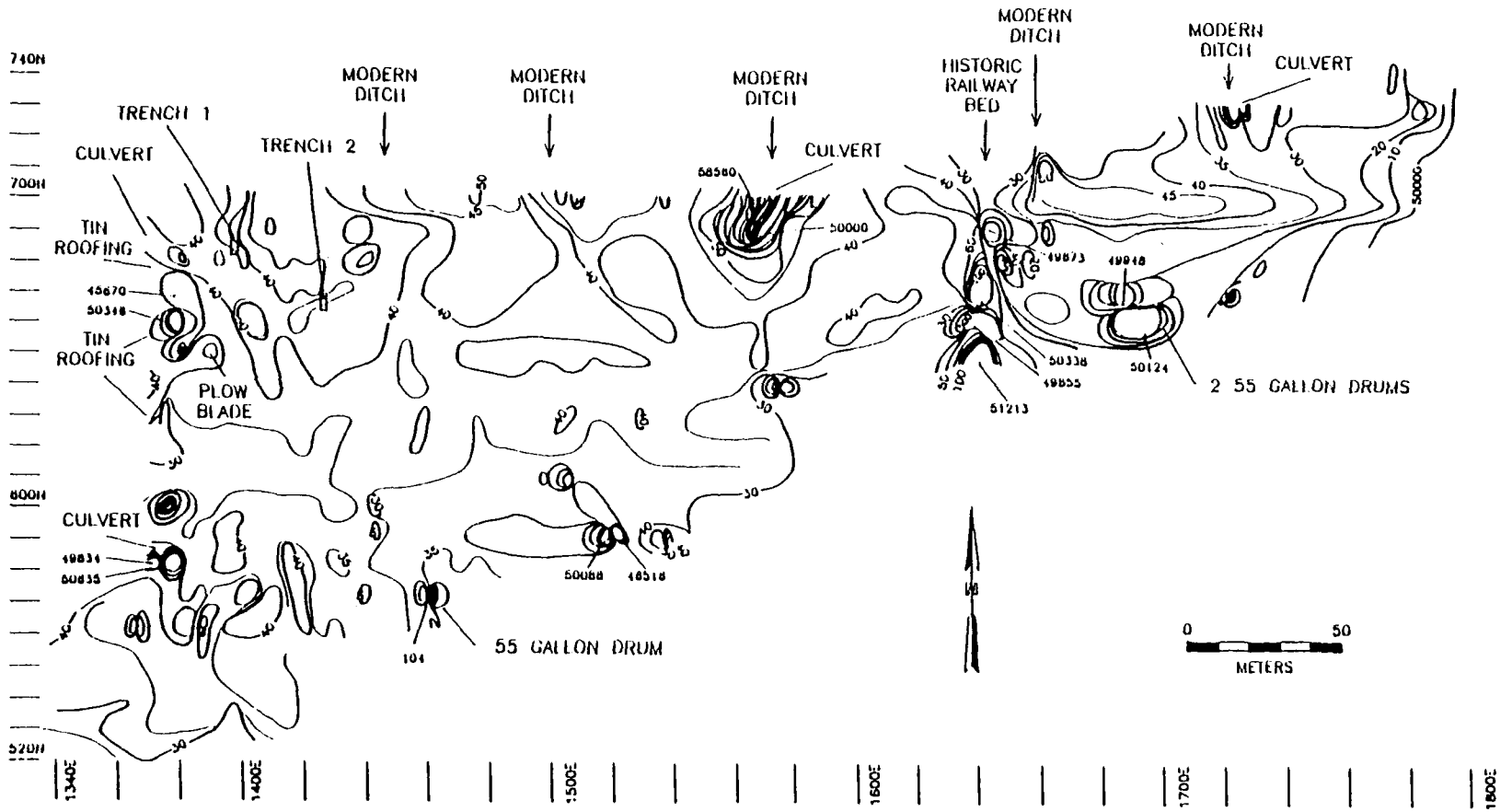
Figure 32. Plan of Segment 6, showing Bethel I (16SMY68)

site area; most occurred within the western portion of the site, near the observed brick scatters. This corresponded well with the site boundaries delineated during pedestrian survey and shovel testing.

A terrestrial magnetometer survey also was performed along every survey transect. Collected magnetic readings were plotted to form a magnetic contour map of Segment 6 (Figure 33). The resultant map depicts both intensive and subtle magnetic anomalies spread throughout the segment. Intensive anomalies normally are associated with large metal objects. For example, large anomalies within Segment 6 included 55 gallon drums, iron culverts, scattered tin roofing, and a plow blade. Subtle anomalies, often linear, are more likely to indicate the presence of important subsurface features such as foundations, filled holes, and trash deposits. However, modern features also affect magnetic readings. For example, five modern drainage ditches cut southward through Segment 6; each is represented, to varying degrees, by linear magnetic anomalies.

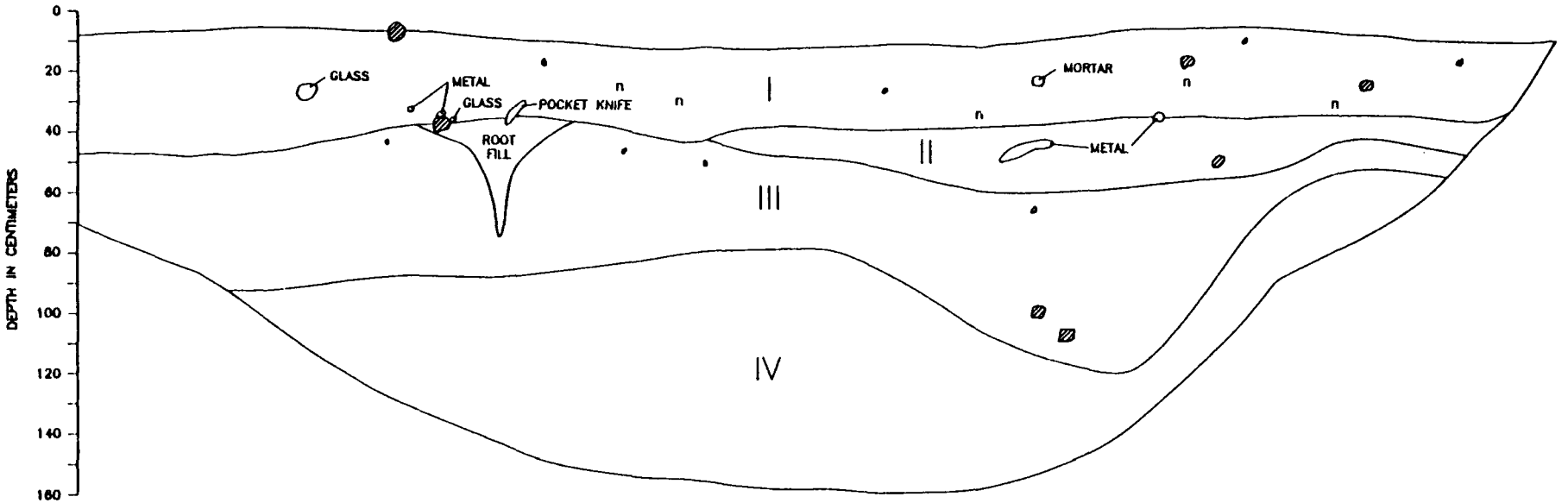
Based on previous experience, very different objects or features can produce very similar magnetic signatures. For example, modern and historic ditches, foundations, ridges, and changing subsurface geology all can produce signatures indistinguishable from each other. A key factor in the interpretation of unidentified magnetic anomalies is patterning, if it is present. Magnetic anomalies not associated with surface expressions, such as large iron objects, foundations, or ditches, rarely can be interpreted accurately without subsurface testing.

During site testing, the site was mapped, and additional testing was conducted within the western half of the site. This testing included excavation of two backhoe trenches across magnetic anomalies, and of three excavation units within the western half of the site. Backhoe Trench 1, at N685, E1395.5, was placed near the northwest end of the site, along a north-south orientation (Figure 32). It was nearly perpendicular and was excavated through the center of an S-shaped linear magnetic anomaly (Figure 33). The 5 m long trench contained four visible strata (Figure 34). Stratum I was a 10YR 4/2 dark grayish brown silty loam which contained a variety of historic artifacts, including ceramic sherds, glass, nails, a pocket knife, soft mud bricks, and mortar. It was a natural topsoil deposit. Stratum II was comprised of 2.5Y 5/2 grayish brown clayey silt mixed with 2.5Y 6/2 light brownish gray silt, and 7.5YR 4/4 dark brown clayey silt. It was confined to the south half of the trench. Artifacts located included brick fragments, metal, nails, and glass. Stratum III consisted of 7.5YR 5/4 brown silty clay mixed with some 10YR 5/3 brown silt. The southern half of the stratum formed a ditch which extended 50 cm into Stratum IV. This ditch contained a moderate amount of material including both fire brick and soft mud brick bats, and much of an embosser' bottle. Other than a few small brick fragments found in the upper 10 cm, the northern half of the stratum did not contain cultural materials. While the soils are virtually indistinguishable, the artifacts clearly indicate that the northern half of the stratum, possibly to the north end of Stratum II, was a natural soil horizon, and that the southern half was an intrusive ditch. The division between the ditch and the natural soil horizon may extend from the north edge of the



NOTE: BASELINE READINGS REFLECT AMPLITUDE (IN GAMMAS) ABOVE 50,000, OR AS SHOWN.

Figure 33. Results of magnetometer survey within Segment 6



I: 10YR 4/2 DARK GRAYISH BROWN SILTY LOAM.

II: 2.5Y 5/2 GRAYISH BROWN CLAY SILT MIXED WITH 2.5Y 6/2 LIGHT BROWNISH GRAY SILT AND 7.5YR 4/4 DARK BROWN CLAY SILT.

III: 7.5YR 5/4 BROWN SILT CLAY MIXED WITH 10YR 5/3 BROWN SILT.

IV: 5Y 6/2 LIGHT OLIVE GRAY CLAY SILT MOTTLED WITH 5Y 5/2 OLIVE GRAY SILT WITH UNCONSOLIDATED HEMATITE GRANULES AND STAINS THROUGHOUT.

BRICK n NAIL

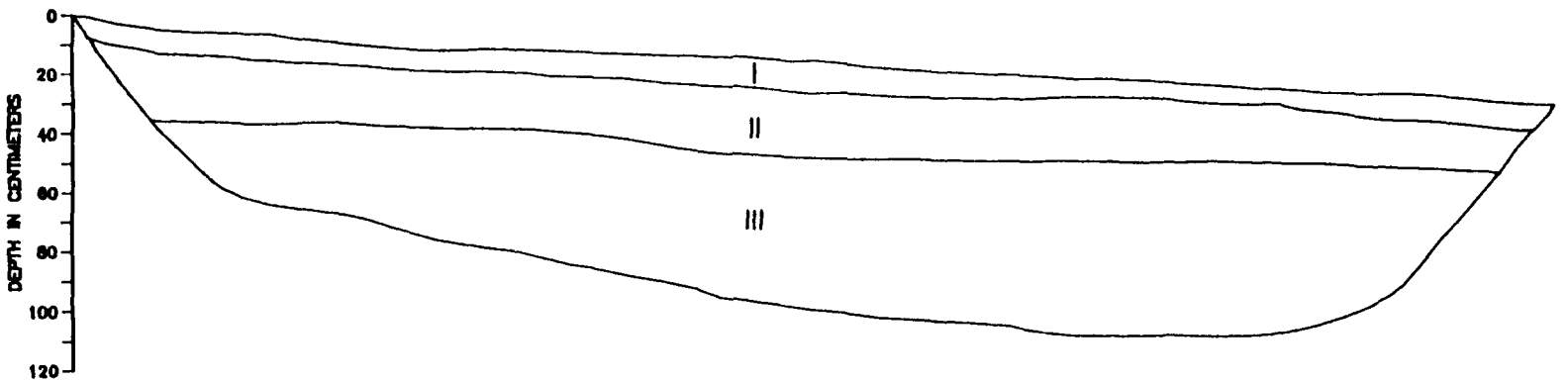
Figure 34. Stratigraphic Profile of east wall of Trench 1, at Bethel I (16SMY68).

trench, where it cuts into Stratum IV, upward to the north end of Stratum II. Stratum IV contained 5Y 6/2 light olive gray clayey silt mottled with 5Y 5/2 olive gray silt, with unconsolidated hematite granules and stains throughout. It did not contain any cultural material.

The feature extending east-west through Trench 1 is a large filled ditch. Since no in situ remains have survived within the ditch, it is difficult to ascertain its original function. It is not a robbed builder's trench, since there is no evidence of a robbed wall within it. Rather, it probably was a drainage ditch. The artifacts from the ditch are consistent with an antebellum to early postbellum temporal affiliation. Prior to the 1870s, the Bethel I area probably was an open, industrialized ridge, containing a sugar house and a brick kiln. Since Trench 1 is located at the northern edge of the woods, within 5 to 10 m of the canefield, it is possible that the ditch marked the southern edge of the pre-Civil War agricultural fields.

Trench 2 in Bethel I was placed southeast of Trench 1, at N676, E1420 (Figure 32), perpendicular to and through a subtle linear magnetic anomaly, along a north-south orientation (Figure 33). The 4.9 m long trench contained three soil strata (Figure 35). Stratum I was a 10YR 4/3 dark brown silty loam, which contained considerable brick fragments. This was the natural developed topsoil. Numerous brick fragments also were observed within Stratum II, a 10YR 5/6 yellowish brown silty loam. In addition to the soft mud brick fragments, a number of artifacts were recovered from these two strata, including bottle glass, a spike, cut nails, and part of a cast iron pot. Stratum III, a 10YR 5/6 yellowish brown silty clay grading into a 7.5YR 4/6 strong brown silty clay, did not contain cultural materials. No features or in situ deposits were present within the trench. The recorded magnetic anomaly appears to have been caused by the rather dense concentration of brick fragments and small iron objects which permeated Strata I and II.

Three 1 x 2 m excavation units were placed within Bethel I to provide additional data about the site. The location for Unit N685, E1446 was selected based on the moderate amount of surface brick, and on the concentration of metal objects in the area located with the metal detector. Three strata, and one soil feature, were located within the unit (Figure 36). Stratum I, a 10YR 3/2 very dark grayish brown loamy silt, contained a large number of artifacts, including yelloware, whiteware, ironstone, pearlware, bottle glass, window glass, and cut nails. A nearly circular soil feature, 58 x 66 cm, was observed near the center of the unit, at the bottom of Stratum I. This 14 cm deep, nearly flat bottomed feature consisted of 10YR 4/3 dark brown loamy silt (Figure 37). Artifacts recovered from the feature included yelloware, cut nails, wire nails, bottle glass, and bone. In addition, five soft mud brick bats and other brick fragments, mortar, and some charcoal were observed within the feature. There was no in situ brick within the feature. The feature appears to have been a hole filled during the late nineteenth or early twentieth century. Since the feature is not associated with any other known features, its original function remains unclear. Stratum II was comprised of 10YR 6/3 pale brown silt. It

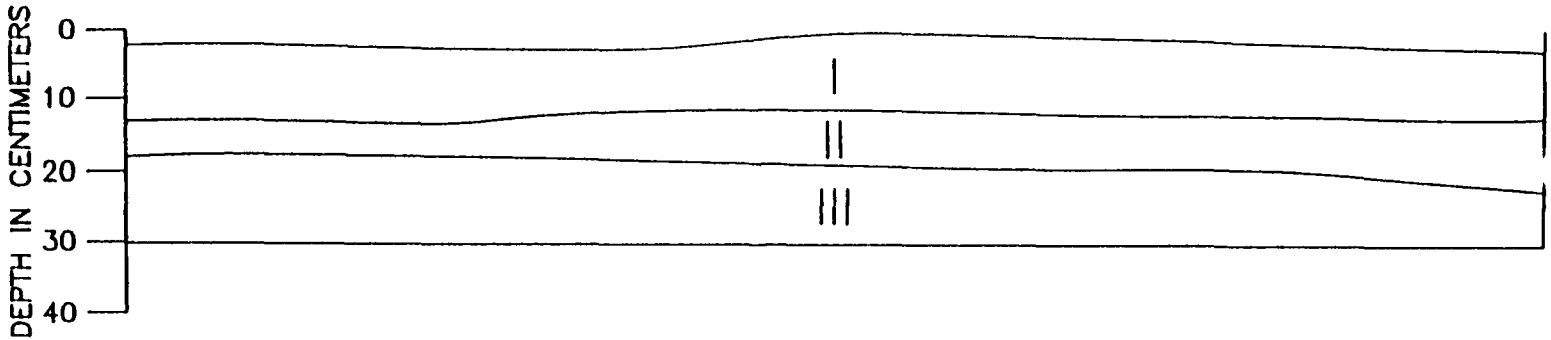


I: 10YR 4/3 DARK BROWN SILTY LOAM.

II: 10YR 5/6 YELLOWISH BROWN SILTY LOAM.

III: 10YR 5/6 YELLOWISH BROWN SILTY CLAY GRADING INTO 7.5YR 4/6 STRONG BROWN SILTY CLAY.

Figure 35. Stratigraphic Profile of east wall of Trench 2, at Bethel I (16SMY68).

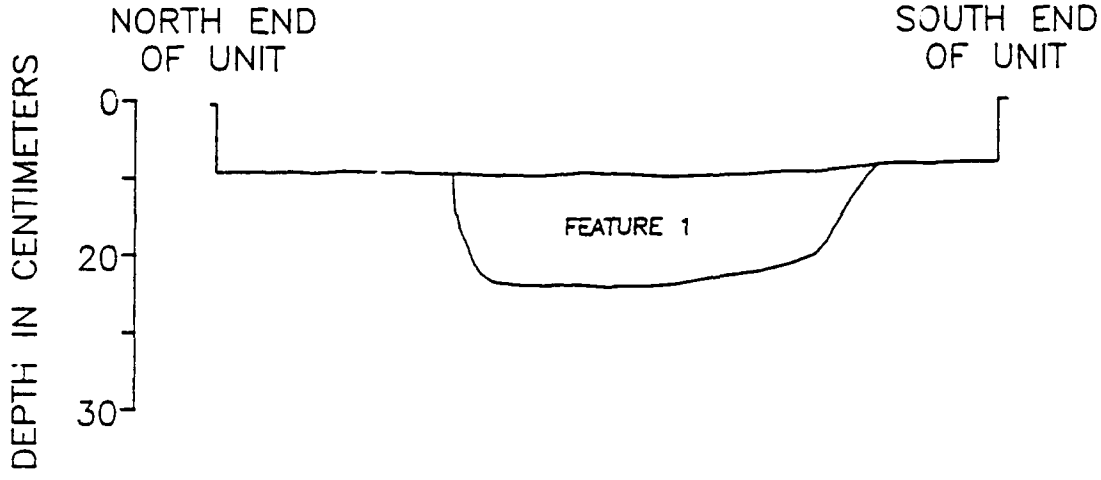


I: 10YR 3/2 VERY DARK GRAYISH BROWN LOAMY SILT.

II: 10YR 6/3 PALE BROWN SILT.

III: 7.5YR 4/6 STRONG BROWN CLAYEY SILT.

Figure 36. Stratigraphic Profile of south wall of Unit N685, E1446, at Bethel I (16SMY68).



FEATURE 1: 10YR 4/3 DARK BROWN LOAMY SILT.

Figure 37. Stratigraphic Profile of west half of Feature 1, Unit N585, E1446, at Bethel I (16SMY68).

overlays Stratum III, a 7.5YR 4/6 strong brown clayey silt. Neither of these strata contained any evidence of artifacts or other cultural disturbances.

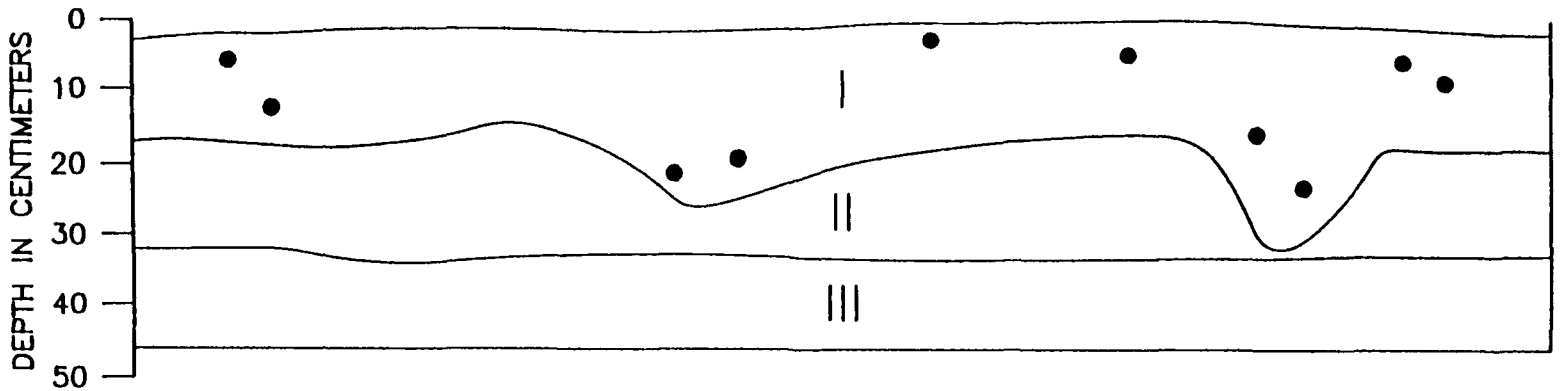
Unit N676, E1404 was placed west of the first unit, within the large brick scatter, and in an area with several metal readings (Figure 32). It contained three natural strata (Figure 38). Stratum I, a 10YR 3/2 very dark grayish brown loamy silt, was a somewhat irregular topsoil deposit. Recovered artifacts included bottle glass, window glass, a jet-black button, cut nails, and a chain part. Soft mud brick fragments, mortar, bone, and charcoal also were observed within the stratum.

Stratum II was comprised of 7.5YR 4/4 dark brown clayey silt. A variety of artifacts was located in the stratum, including whiteware, yelloware, ironstone, gray stoneware, redware, bottle glass, a porcelain button, window glass, and cut and wire nails. Soft mud brick fragments, mortar, coal, and charcoal were observed, but not collected. The third stratum, including an interface zone with Stratum II, contained 7.5YR 4/4 dark brown clayey silt grading into 7.5YR 5/4 brown fine sandy silt. No cultural materials were located in this stratum. In addition, no in situ features or deposits occurred within any of the three excavated strata.

Unit N630, E1467 was placed towards the southeastern end of the brick scatter, in a 2 to 3 m diameter area containing a higher concentration of bricks than was observed throughout most of the site. Three natural strata and one feature were observed within the unit (Figure 39). Stratum I, a 10YR 3/2 very dark grayish brown clayey silt, was the developed topsoil that covered most of the site. It contained a few artifacts, including whiteware, bottle glass, and table glass. A shallow basin-shaped feature extended through Stratum I into the top edge of Stratum II. It was surmounted with a moderately dense brick scatter, and it was filled with 2.5Y 2/0 black charcoal and burned earth. One small cut nail fragment was recovered from the feature fill. Based on its shape, morphology, and contents, the feature may represent a campfire. While no ring of bricks was visible, the concentration of bricks near the unit may have been transported to this location to form a campfire ring, now scattered. Since its stratigraphic profile extends virtually to the ground surface, the campfire without a doubt dates from the twentieth century.

Stratum II was comprised of 10YR 6/3 pale brown silty clay mottled with 7.5YR 4/6 strong brown clay. Other than a few brick fragments in its interface zone with Stratum I, no artifacts were recovered from the stratum. Stratum III was 7.5YR 4/6 strong brown clay of undisturbed Red River deposits. No cultural materials or disturbances were located in this stratum.

Historic documentation, including Civil War period maps (Figures 9 and 10), and personal recollections of the Bisland battles, indicates Bethel's Lower sugar house, east bank, was situated within or very close to Bethel I (16SMY68). In addition, George N. Carpenter, a soldier in the 8th Regiment, Vermont Volunteers, stated that there was a



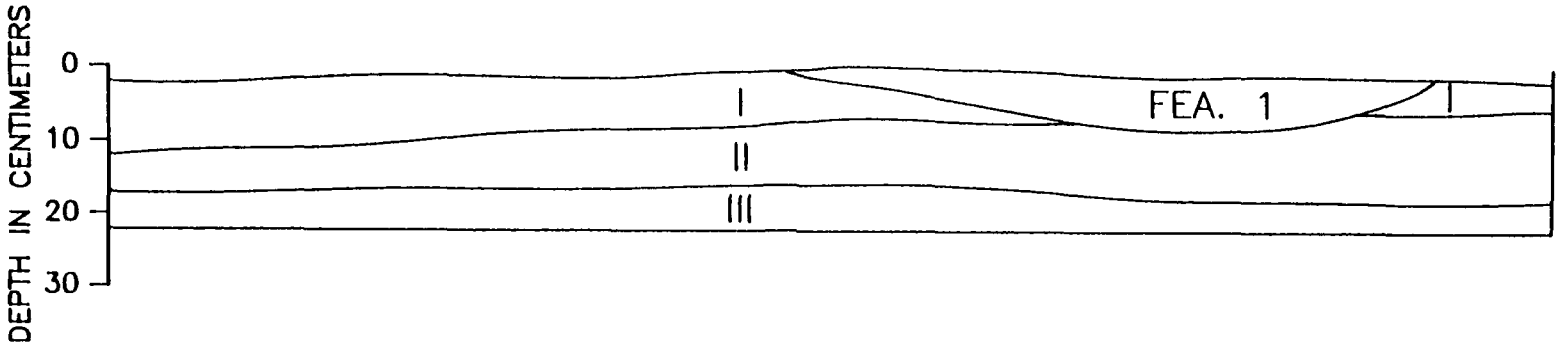
I: 10YR 3/2 VERY DARK GRAYISH BROWN LOAMY SILT.

II: 7.5YR 4/4 DARK BROWN CLAYEY SILT.

III: 7.5YR 4/4 DARK BROWN CLAYEY SILT GRADING INTO 7.5YR 5/4 BROWN FINE SANDY SILT.

• BRICK FRAGMENTS

Figure 38. Stratigraphic Profile of north wall of Unit N676, E1404, at Bethel I (16SMY68).



I: 10YR 3/2 VERY DARK GRAYISH BROWN CLAYEY SILT.

II: 10YR 6/3 PALE BROWN SILTY CLAY MOTTLED WITH 7.5YR 4/6 STRONG BROWN CLAY.

III: 7.5YR 4/6 STRONG BROWN CLAY.

FEATURE 1: 10YR 3/2 VERY DARK GRAYISH BROWN CLAYEY SILT AND 2.5Y 2/0 BLACK CHARCOAL.

Figure 39. Stratigraphic Profile of south wall of Unit N630, E1467, at Bethel I (16SMY68).

brick kiln next to the sugar house (Carpenter 1886:85). The recovered artifacts could date from the antebellum and Civil War periods, corresponding well with the known occupation of the area. Despite intensive testing and excavations within the site, no in situ remains of either structure were located.

In summary, archeological survey and site testing at Bethel I, including the magnetometer survey and metal detector survey, failed to locate in situ structural features or deposits. The three features that were located included a probable antebellum drainage ditch, a possible posthole without association to other features, and the remains of a twentieth century campfire.

Segment 7

Segment 7 is situated in dense woods directly west of Segment 6, between cane fields and Bayou Teche (Figure 1). During pedestrian survey and shovel testing, a total of 18 shovel tests were excavated within this short segment (Figure 40). These shovel tests were placed within the same grid system previously established for Segments 6 and 8. A third of the segment was inundated; shovel tests were not placed in areas containing standing water. None of the excavated shovel tests contained cultural materials, although charcoal was observed in two of them.

One concrete foundation was situated near the northwest edge of the segment. The observed foundation is a 1.08 x 3.28 m concrete machinery mount located at N430, E987, at the north edge of the woods adjacent to a cane field. The cement is tempered with crushed red brick. The mount included three iron straps on its top, along with eight vertical iron bolts used for securing machinery to it. The mount may not be in situ. A moderate amount of metal and other debris, along with dirt, has been pushed up around it. In addition, there is no evidence of associated features or artifacts. The function of this mount remains unclear. It could be a mount from a sugar house. However, the nearest known historic sugar house was located near the west end of Segment 6, several hundred meters to the east. It also could be a mount for a boiler or pump associated with water procurement for rice irrigation. Insufficient data have survived to confirm or refute this contention.

Segment 8

Segment 8 encompasses densely overgrown woods west of Segment 7, at the western end of the Bayou Teche portion of the project area (Figure 1). It is situated between cane fields and overgrown fields to the north, and Bayou Teche to the south. During initial pedestrian survey and shovel testing, 369 shovel tests and 16 auger tests were excavated in Segment 8, along the established grid system (Figure 41). One historic archeological site, Calumet (16SMY67), was located within the segment.

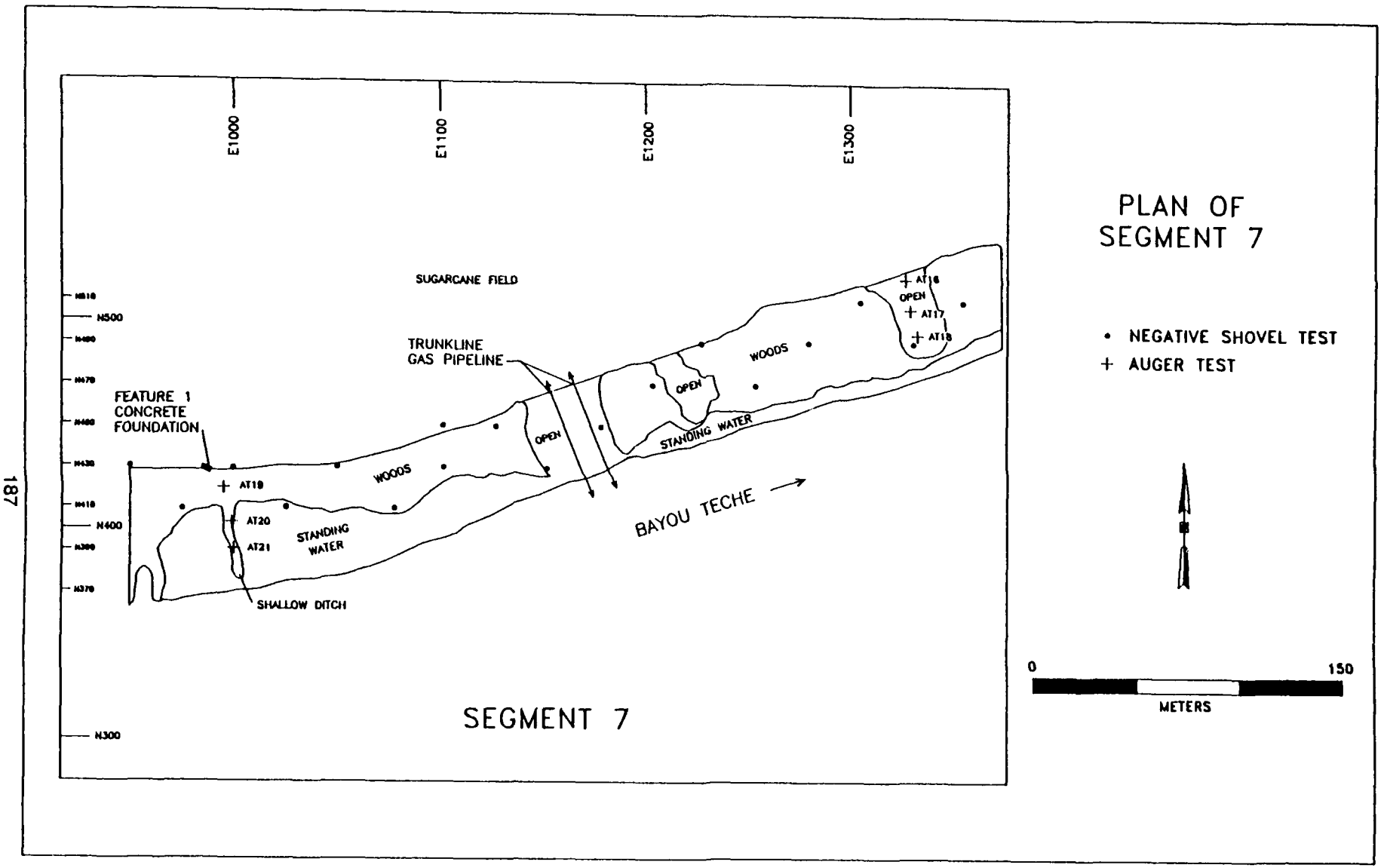


Figure 40. Plan of Segment 7 survey area.

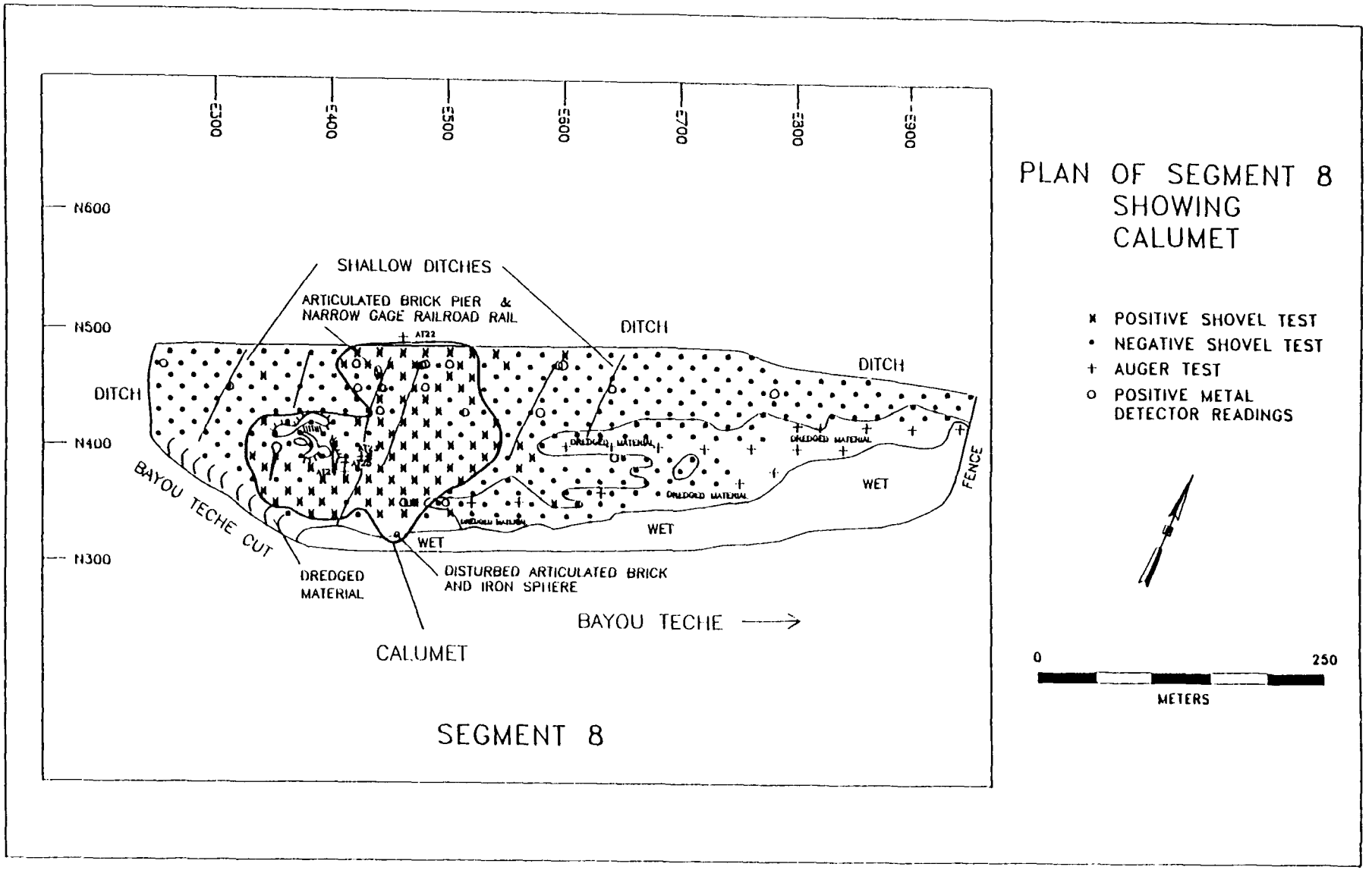


Figure 41. Plan of Segment 8, showing Calumet (16SMY67)

Calumet is located on the natural levee ridge along Bayou Teche. Most of the site was defined based on cultural materials recovered from shovel tests, and observed on the ground surface. In addition, the west end of the site was expanded to incorporate irregular earthen piles and depressions (Figure 41). Within the Calumet site boundaries, 80 (70 per cent) of the 115 excavated shovel tests contained cultural materials. Excluding the area surrounding the piles and depressions, 74 (80 per cent) of the excavated 92 shovel tests within the site were positive. Outside of the site boundaries, cultural materials were located within only 9 (3.5 per cent) of the 254 excavated shovel tests. All excavated auger tests were negative.

Cultural materials recovered from shovel tests within Calumet included undecorated and molded whiteware; domestic gray stoneware; various bottle glass, including a tooled lip fragment; nails; bone; and half of a red fire brick with yellow inclusions. Brick fragments, stiff mud bricks, a few soft mud bricks, charcoal, and a modern aluminum pole also were observed. While most of the artifacts were not diagnostic, the preponderance of stiff mud bricks suggests that the site was occupied during the twentieth century.

A 27 x 47 cm brick pier was observed at N465, E440. This pier was constructed of soft mud bricks and was bonded with cement. The pier is three courses high; cement on the top indicates that it originally included at least one more course. The pier, which is not level, may not be in situ. No additional brick pier or foundation remains were observed near this pier. A twisted narrow gage rail lies 5 m south of the pier, at N460, E440. No clear railway bed is associated with the rail.

An articulated brick foundation segment, and an adjacent large iron object, are located at N322, E453. The articulated brick, which measures 55 x 53 x 43 cm, is constructed of stiff mud bricks. It is not in situ; rather, it lies on its side. The thick, cast iron object, the visible portion of which forms nearly half of a sphere, is 1 m in diameter, and 47 cm high. It is reinforced with 12 cm wide iron straps, each of which is secured to the sphere by two parallel lines of large iron rivets. Seven evenly spaced straps extend from the ground surface over half way to the top of the sphere. At that point, they are connected by an eighth strap, which forms a ring 2/3 of the way to the top. The function of this object remains unclear. Possible interpretations include a buoy, and an overturned sugar kettle. A 20 x 25 m area surrounding the articulated brick and the sphere is covered with a scatter of stiff mud bricks. Some modern debris, including a 55 gallon drum, is scattered just north and east of the features.

As within Segment 6, the metal detector survey, which was conducted along every other transect, was structured to identify metal concentrations. Metal detector readings within the segment were plotted on the site map (Figure 41). Most of these occurred within the site area, although a few readings were recorded both east and west of the site. A few of the readings were identified. Within and adjacent to the site, an iron re-bar, a machinery mount fragment, and an iron file were located. Outside of the site, an iron wing nut, a carriage bolt, a spiked tooth harrow tooth, and a metal pipe were observed.

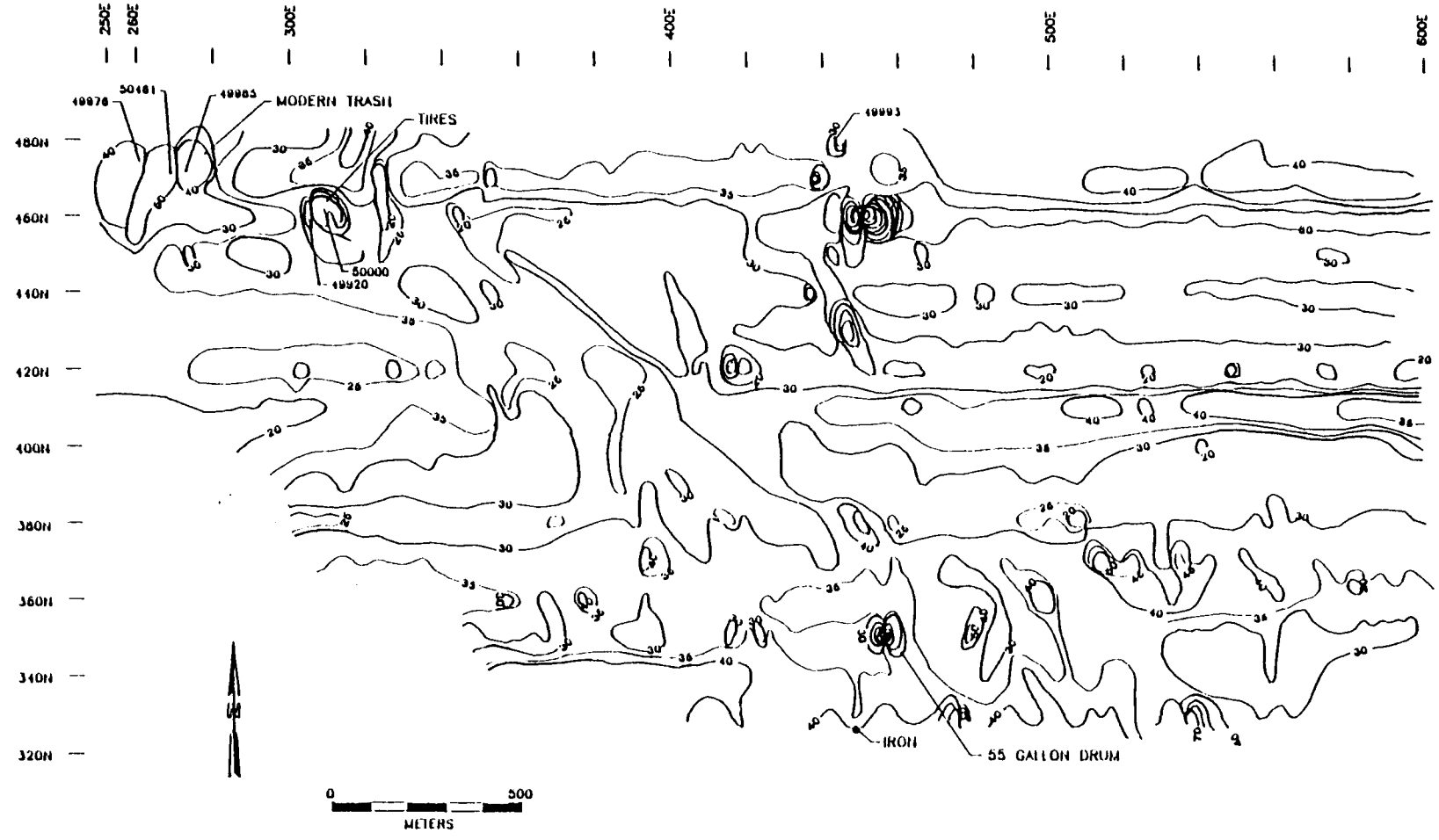
These objects provide little additional data about the site, since most could be field scatter associated with historic agricultural use of the property.

A terrestrial magnetometer survey was conducted along each transect in Segment 8, following the same procedures used in Segment 6. The collected data were plotted, to form magnetic contour maps of the segment (Figures 42 and 43). As within Segment 6, both intensive and subtle anomalies were located throughout the segment. Intensive anomalies included modern trash, tires, a 55 gallon drum, a stove, and a sink. On the other hand, a barbed wire fence at the east end of the segment, and several shallow agricultural ditches resulted in subtle variations to the magnetic field. Most of the resultant magnetic contours in Figures 42 and 43, however, are linear variations extending along the survey transects. These contours mark slight changes in the recorded magnetic field between the transects rather than magnetic signatures associated with cultural resources or subsurface soil disturbances. Interpretation of terrestrial magnetic anomalies is discussed more fully in the Segment 6 section.

Two unidentified structures are depicted at Calumet (16SMY67) on a 1935 U.S. Army Corps of Engineers map (Figure 44, and on the 1933, 1941, and 1954 U.S.G.S. 15' series topographic quadrangles, Patterson, Louisiana). However, they are not shown on the 1966 U.S.G.S. 7.5' series topographic quadrangle, Patterson, Louisiana, indicating that they were destroyed between 1954 and 1966. Most of the site's surface deposits were damaged during the 1970s or 1980s. Unlike most of Segment 8, which is wooded, the eastern half of the site is in dense primary and secondary growth, with no mature trees. In addition, several low bulldozer piles and ridges were observed, especially at the edge of the modern growth, adjacent to the woods. Based on the recency of the site, and its extensive surface disturbance, no additional testing was conducted at Calumet.

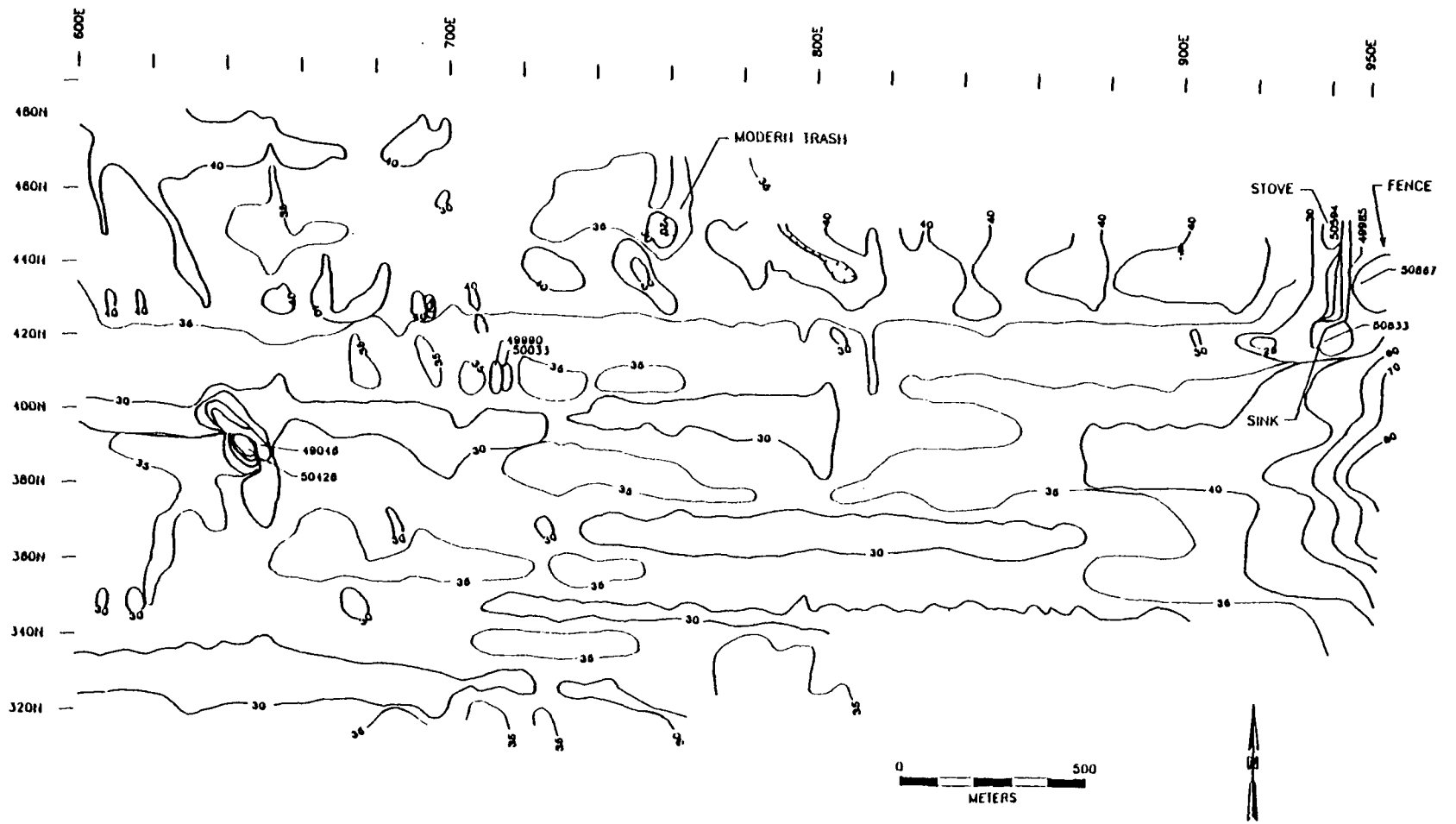
Segment 9

Segment 9 is situated on the right descending bank of Bayou Teche, in woods, wooded lawn, and wooded swamp near the mouth of the bayou (Figure 1). Most of the northeast side of the segment, along Bayou Teche, is inundated or covered with fill (Figure 45). The northwest end, along the Teche, is covered with standing water. Just downstream, over 100 m along the Teche is filled swamp converted into a lawn with a driveway, pond, and a slip. These are associated with a house located a short distance outside the current project area. Further downstream is an area covered with large bulldozer mounds of fill; a large new house built on fill and dredge spoil occupies the next lot downstream. The remaining portion of Segment 9 along Bayou Teche is wooded swamp. A modern refuse dump, on fill, is situated at the extreme southeastern end of Segment 9. Because of standing water and extensive disturbance, most of the area along Bayou Teche was not surveyed.



NOTE: BASELINE READINGS REFLECT AMPLITUDE (IN GAMMAS) ABOVE 50,000, OR AS SHOWN.

Figure 42. Results of magnetometer survey of west half of Segment 8



NOTE: BASELINE READINGS REFLECT AMPLITUDE (IN GAMMAS) ABOVE 50,000, OR AS SHOWN.

Figure 43. Results of magnetometer survey of east half of Segment 8

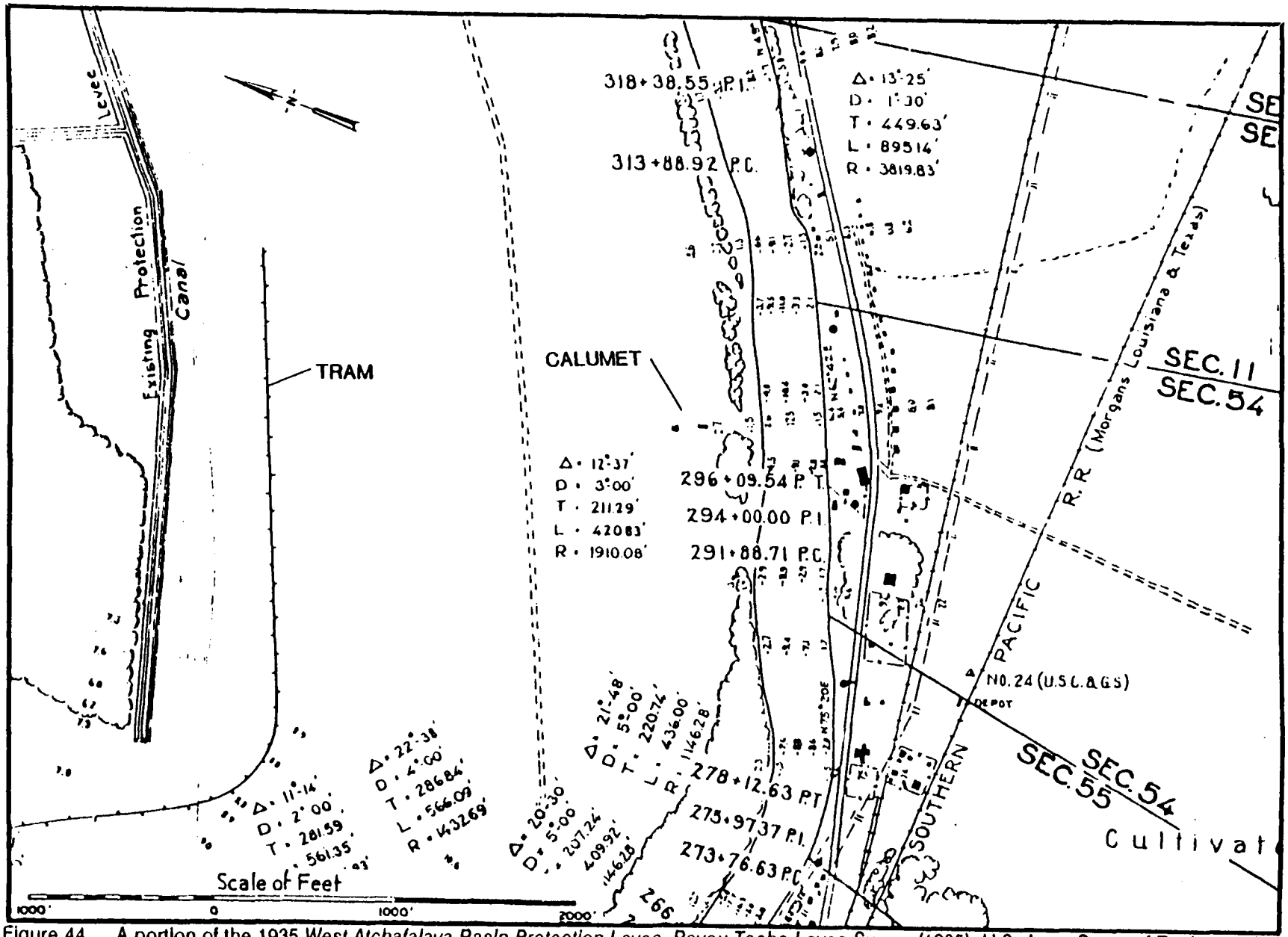


Figure 44. A portion of the 1935 *West Atchafalaya Basin Protection Levee, Bayou Teche Levee Survey* (1935), U.S. Army Corps of Engineers, File H-8-12470, showing structures at Calumet (16SMY67), tram, canal, and existing protection levee.

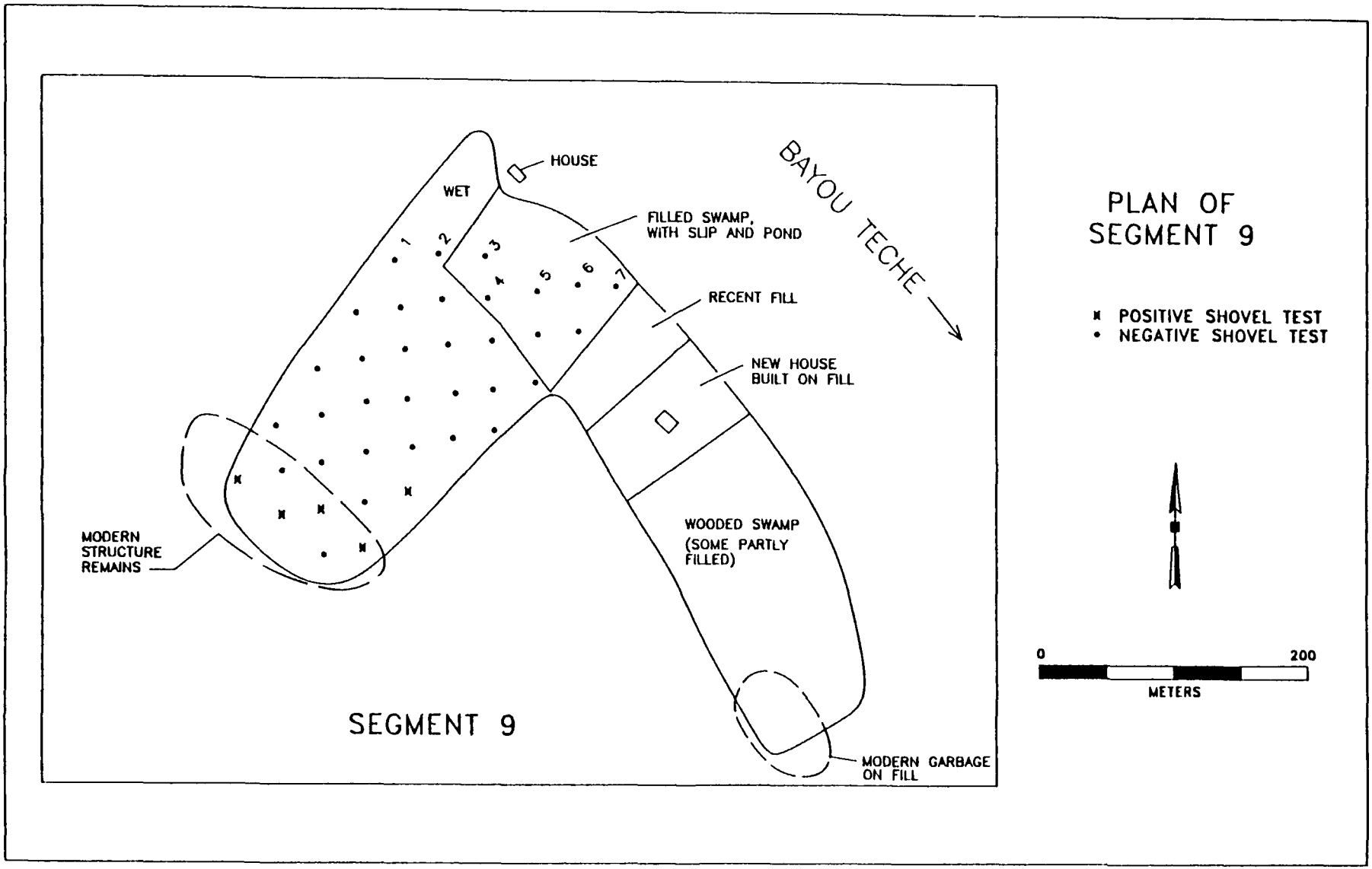


Figure 45. Plan of Segment 9 survey area

During survey, 37 shovel tests, along seven transects, were excavated within the segment (Figure 45). Five of these shovel tests, all near the southwest end of the segment, contained twentieth century debris, including whiteware, modern bottle glass, window glass, nails, bone, gravel, brick fragments, charcoal, shell, and styrofoam. In addition, a 2 m diameter circular cement rim, part of a mid-twentieth century cattle dipping apparatus, was located near Transect 4 about 75 m from the southwest end of the segment. These materials and the feature are associated with twentieth century structures that stood at the southwest end of Segment 9. The 1941 U.S.G.S. topographic map depicts five closely spaced structures in that area. As late as 1981, three structures remained standing (Figure 1). Since 1981, these three remaining buildings have been razed, although the cinder block foundation of one remains a short distance northwest of the project area.

Segment W-112

Segment W-112, part of the Bisland battlefield (16SMY166) area, was located at the west end of the project area, in woods and pasture along the Wax Lake Outlet north of the Bayou Teche cut (Figure 1). It is part of the levee right-of-way for the WABPL Item W-112. During the 1940s construction of the Wax Lake Outlet, a containment dike was constructed along the Wax Lake Outlet, and dredged material was pumped east of the containment dike. The current testing was designed to ascertain the depth of dredged material deposits, and to test the W-112 area for potentially significant features associated with the Bisland battlefield.

Testing within Segment W-112 began with establishment of a grid system, with point N1000, E1000 situated 14.0 m west of Levee Station WABPL 236, LM 597, 1983, along an axis perpendicular to the levee centerline. Fifty-eight auger tests were excavated across the segment to ascertain depth of dredged material deposits (Figure 46). These auger tests demonstrated that the area west of the containment dike, between it and the Wax Lake Outlet, did not contain any dredged material deposits. However, east of the dike, up to 3 m or more of dredged material deposits covered the W-112 levee area. As noted on Figure 46, these deposits were thickest near the dike, and gradually thinned towards the levee and the borrow pit to the east. Other than a linear strip along the south half of the borrow pit, all of Segment W-112 east of the containment dike was covered with dredged material.

The thick dredge deposits made subsequent testing east of the dike impractical. In addition, the southern 300 m of the segment, between the levee and the outlet, were disturbed extensively by ongoing borrow pit excavation. Therefore, subsequent archeological testing within Segment W-112 was confined to the 75 to 80 m wide area between the containment dike and the Wax Lake Outlet, and north of the borrow pits. While most of this area was testable, a large portion between N1950 and N2450 was

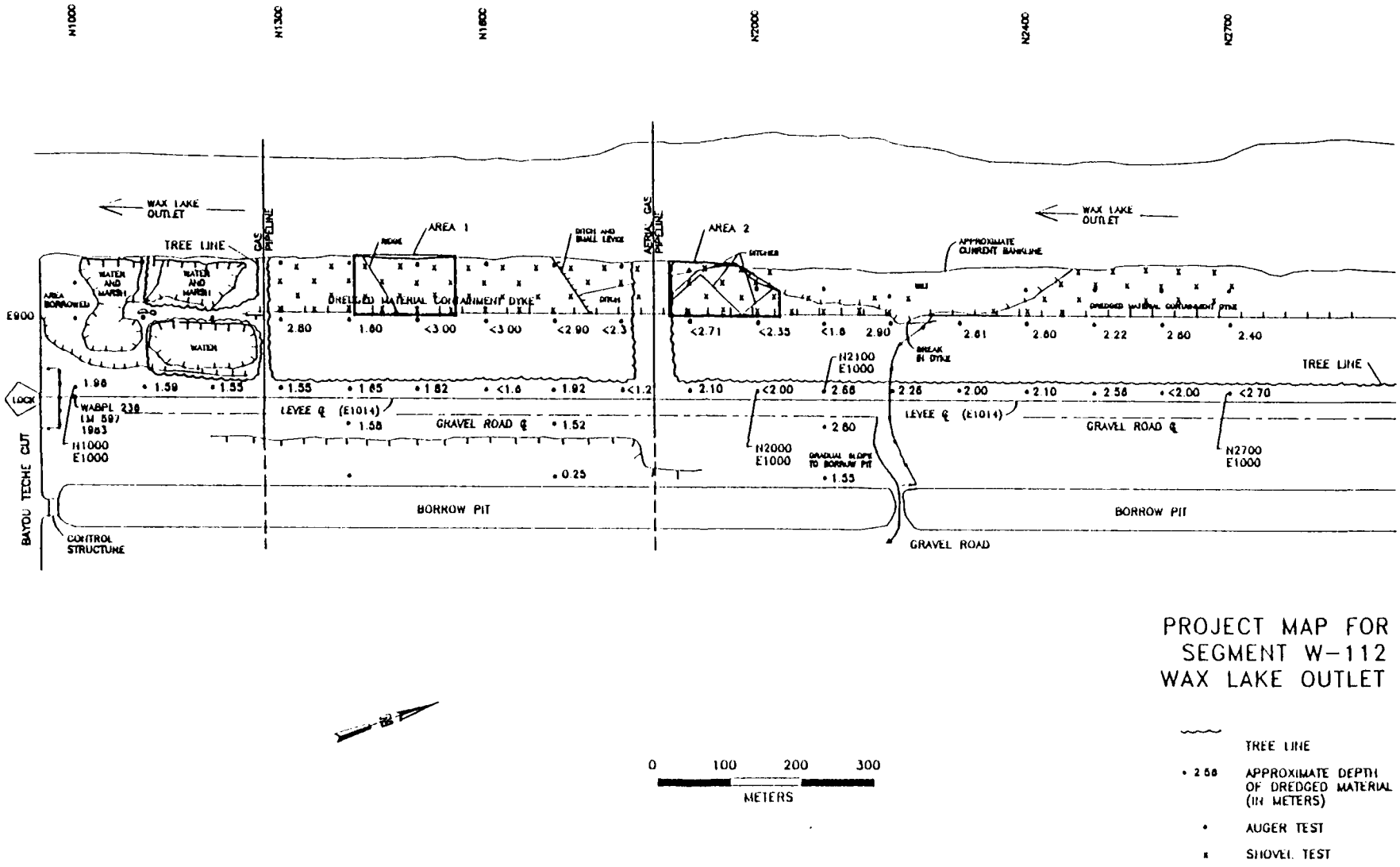


Figure 46. Plan of Segment W-112 at Wax Lake Outlet

eroded and redeposited soil, most of which was inundated. While a few shovel tests and auger tests were placed in this area, most of it could not be tested.

A total of 78 shovel tests were placed within the testable portion of Segment W-112, along the Wax Lake Outlet (Figure 46). These shovel tests were placed along four parallel transects, and each was assigned a grid coordinate. No evidence of cultural material was observed or recovered from any of these shovel tests. Beginning adjacent to the eroded area at N1950 and extending northward to the north end of Segment W-112, most of the shovel tests contained varying amounts of modern overbank deposition. For example, the shovel test at N1950, E845 exhibited a stratigraphic soil profile of 48 cm of 10YR 5/3 brown silt overlying 4 cm of 10YR 2/1 black silty loam, a buried A horizon. Between 52 and 68 cm, the soil was a 10YR 4/1 dark gray loamy clay, with 7.5YR 4/6 strong brown mottles. This basal stratum was an undisturbed natural levee deposit.

Several terrain features were observed along the Wax Lake Outlet (Figure 46). A low, 2 m wide ridge was located at N1500, E850; it is discussed more fully later. Several shallow ditches occurred between N1700 and N2025. These ditches generally were 1.5 to 2 m wide and 10 to 30 cm deep. They zigzag across the survey area along approximate 65° and 155° azimuths. One, situated at N1725, was situated immediately south of a 50 to 70 cm high levee. All of these ditches probably were agricultural field drainage ditches situated along and near the south and west ends of fields. A 1930 U.S. Army Corps of Engineers aerial photograph depicts a zigzag, treeline and agricultural field drainage ditches in the same locations as the observed ditches. The southern ditch, and its adjacent canal, are labeled "Canal" and "Existing Protection Levee" on a 1935 U.S. Army Corps of Engineers map (Figure 44).

Another ditch was 60 to 70 cm deep, and 6 to 7 m wide, substantially larger than the other observed ditches. It extended between N1730, E865 to the south, and N1950, E820 to the north, along a 3° azimuth. The southern end terminated at the previously mentioned small levee adjacent to a ditch, while the northern end flowed into the Wax Lake Outlet. The 1930 aerial photograph shows this ditch along the edge of an agricultural field, and extending into the woods to the north. Based on its location and orientation, this ditch could be remains of the secondary Confederate defensive earthworks at Bisland.

In accordance with the Scope of Services (Appendix I), two grid cells were selected for additional testing. One of these, Area 1, was selected randomly within the battlefield portion of Segment W-112, between the dike and the outlet. The other, Area 2, was placed directly north of an aerial gas pipeline. It was selected to include much of the possible Confederate earthworks. Testing conducted within these areas included terrestrial magnetometer surveys along transects spaced at 10 m intervals, and metal detector surveys along the same transects.

Data collected during the magnetometer survey of Area 1 were plotted to form a contour map of the area (Figure 47). Both intense and subtle magnetic anomalies were observed within Area 1. No causes were observed for the large anomalies, although one, at N1440, E810, was recorded on a small, broad rise immediately adjacent to the Wax Lake Outlet. While numerous subtle anomalies were observed, most of them were similar to the broad linear anomalies observed within Segment 8 along the same orientation as the survey transects. Most of the anomalies within Area 1 probably reflect survey transects more than historic features and land uses. The one feature observed within the site, the low ridge, produced a subtle magnetic signature. Subsurface testing would be necessary to interpret accurately the other observed anomalies. Terrestrial magnetic anomalies are discussed more fully elsewhere.

The metal detector survey resulted in the recordation of 145 readings throughout the area. Of these readings, 130 (90 per cent) were located within 5 m of the ridge which passes through the area (Figures 46 and 47). The remaining 15 (10 per cent) were scattered evenly throughout the rest of the area. This indicates that the ridge was not a field levee, or spoil from a filled ditch, since neither would result in a substantially higher concentration of artifacts along the ridge than elsewhere in the area. Rather, the ridge is remains of a small twentieth century tram system. It is depicted on a 1935 U.S. Army Corps of Engineers map, where it is labeled "Tram" (Figure 44). The tram originated northwest of the project area, near the Verdunville Canal and extended southward near Bayou Teche to the current Wax Lake Outlet area, where it turned eastward through the W-112 area, terminating within Section 54. The tram was dismantled by the early 1940s, when Wax Lake Outlet was constructed.

Area 2 was located immediately north of an elevated gas pipeline (Figure 46). The terrestrial magnetics within the southern 60 m were masked by the overwhelming influence of the pipeline; no terrestrial magnetic anomalies were observable within that area (Figure 48). Within the remaining 90 m, two intense, and only a few subtle anomalies were recorded. One of the intense anomalies was a 55 gallon drum, while the other was a large piece of sheet iron. The subtle anomalies generally were oval shaped positive and negative anomalies. A few were associated with shallow field ditches, but the others could not be associated with visible artifacts or features.

The metal detector survey results reflect the sparse use of this historic backswamp area. Other than modern surface debris, no readings were recorded along the survey transects. During site testing, a metal detector survey along the entire length of the possible Civil War trench, along with the smaller ditch that intersects it, was conducted. During this survey, 21 metal readings were recorded, and 16 of these metal objects were identified (Figure 49). Other than a cut nail and a probable cut nail, all recovered objects were modern debris; most were associated with construction of the elevated pipeline. The survey provided no useful data for interpreting the original function of the ditch.

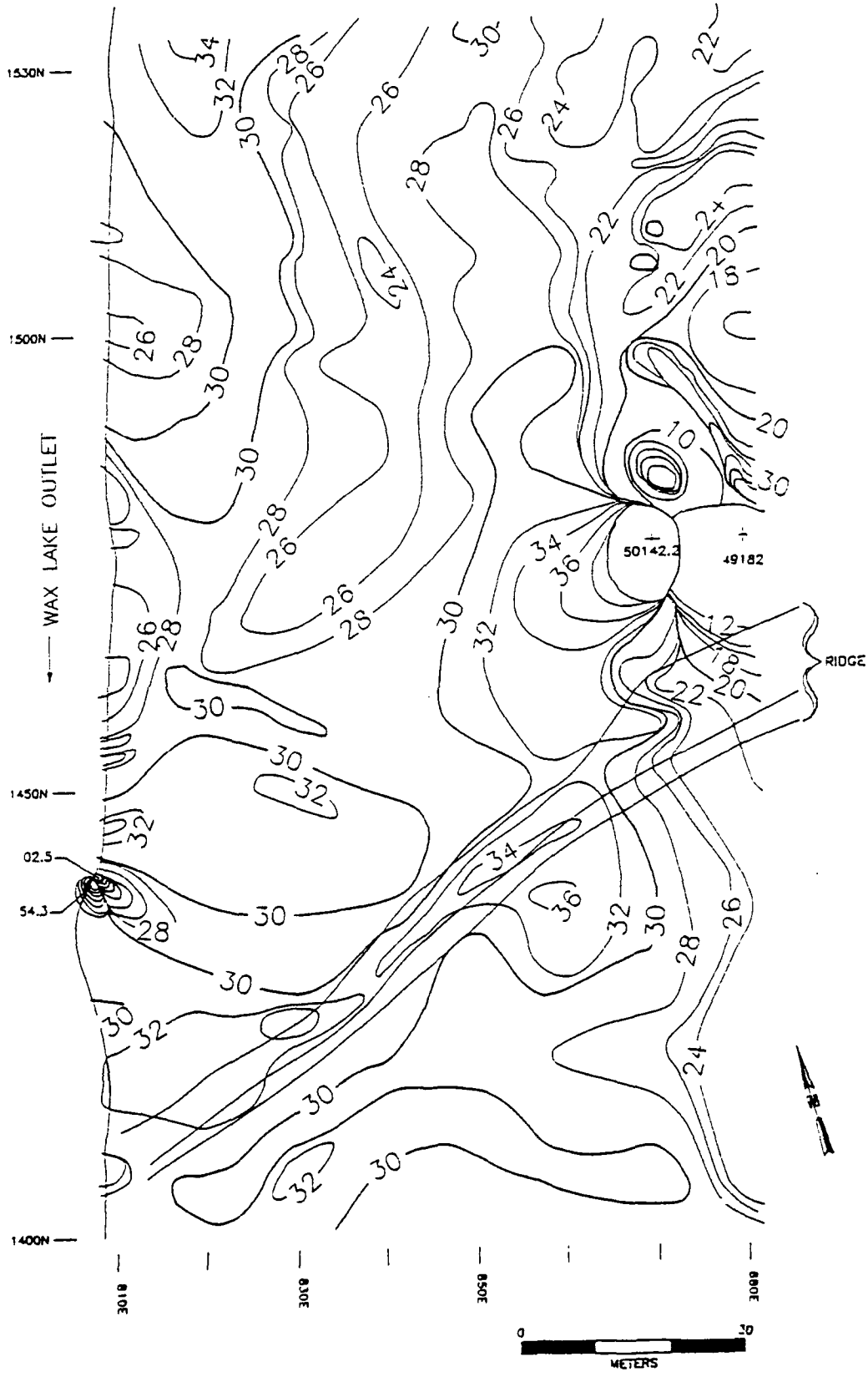


Figure 47. Results of magnetometer survey of Segment W-112, Area 1

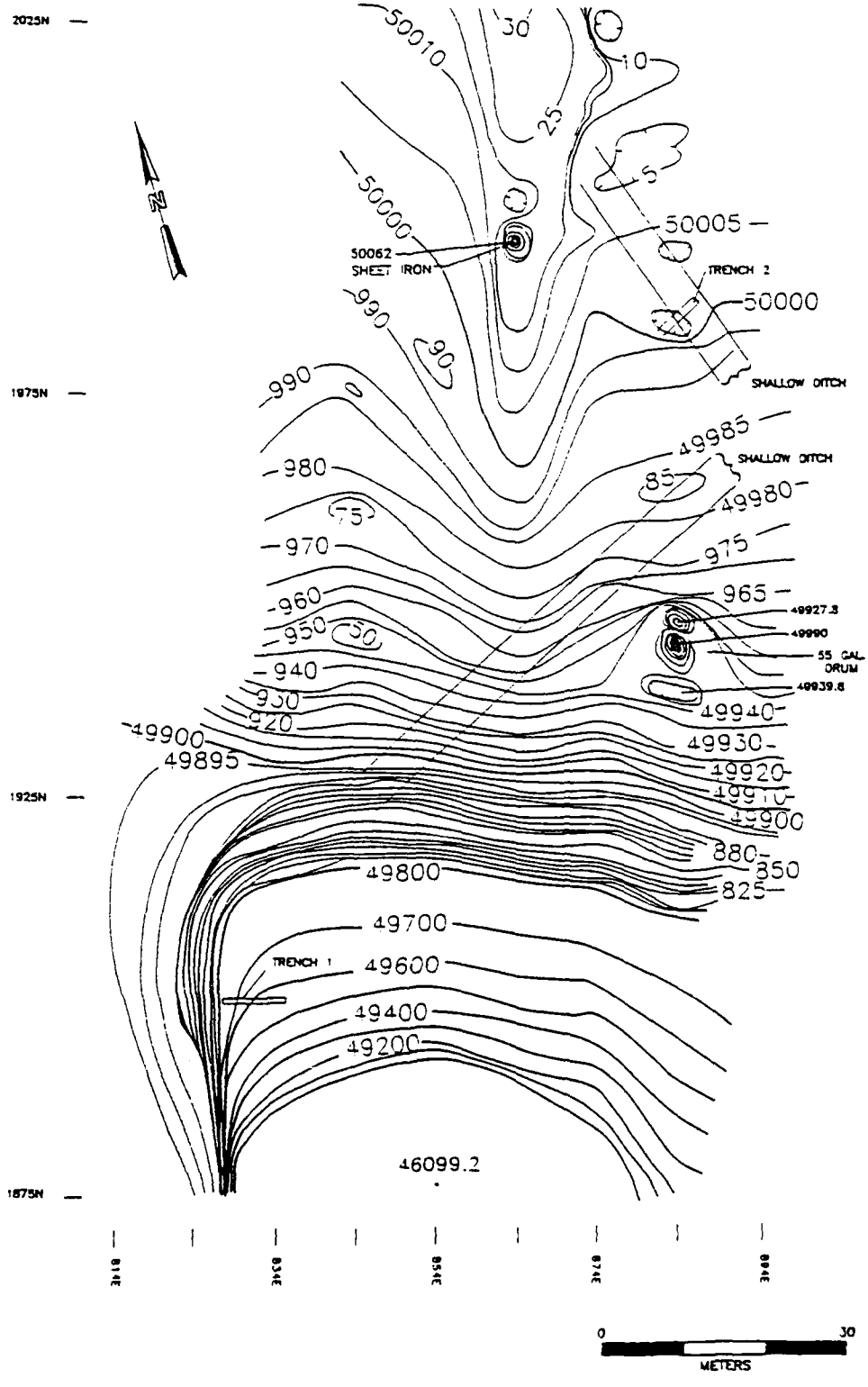


Figure 48. Results of magnetometer survey of Segment W-112, Area 2

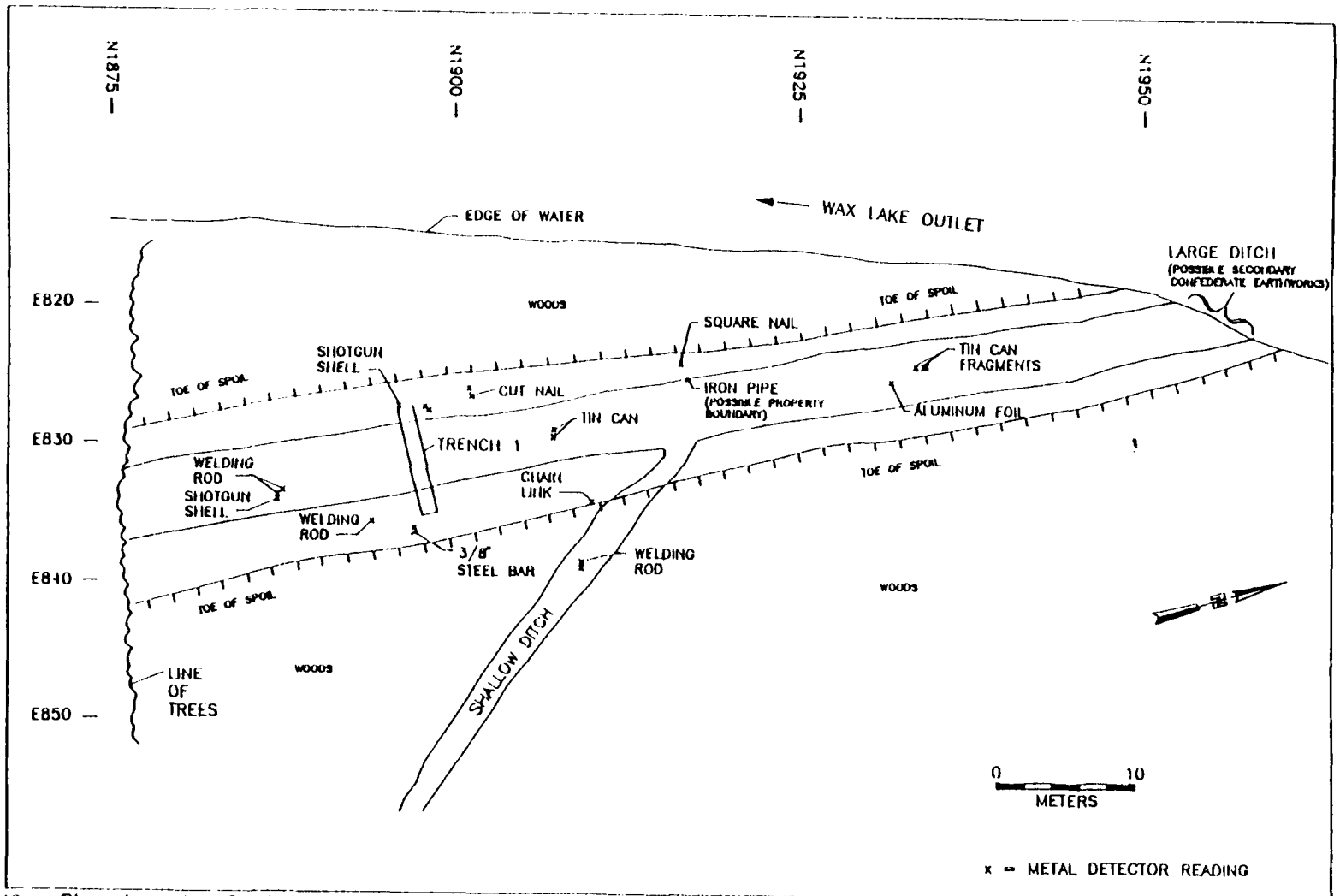


Figure 49. Plan of possible Confederate earthworks in Segment W-112, Area 2, showing the location of Trench 1, and results of the metal detector survey.

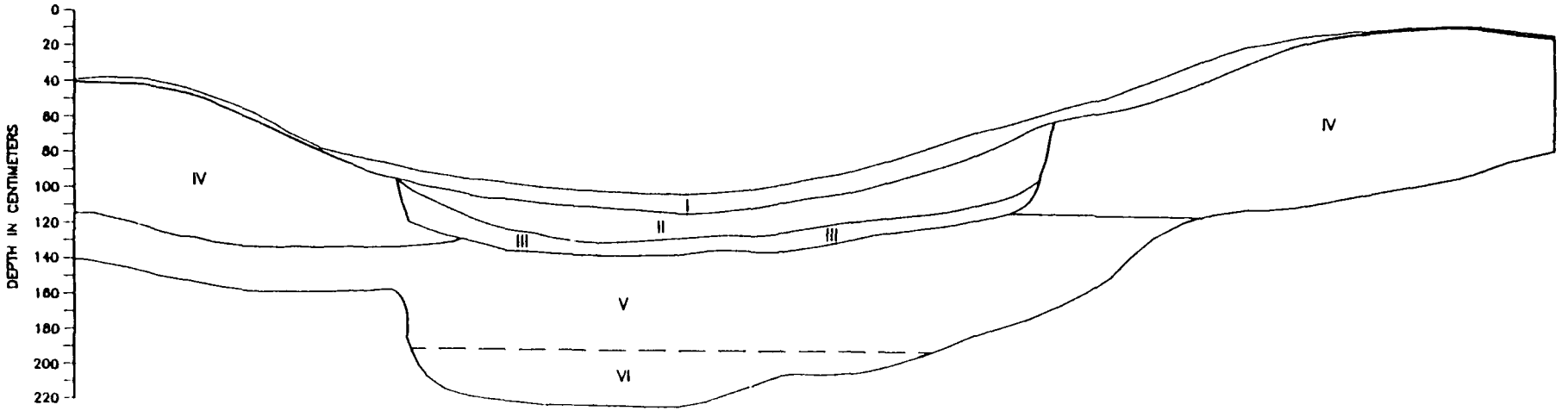
During site testing, two backhoe trenches were excavated within Area 2. Trench 1 bisected the possible Civil War trench, with its southwest corner at N1895, E827 (Figures 48 and 49). Six soil strata were observed within this 8.5 m long trench (Figure 50). Stratum I, a 10YR 3/2 very dark grayish brown silty loam, was a poorly to moderately developed topsoil which overlay the trench. Stratum II contained 10YR 5/3 brown very fine sandy silt mixed with 10YR 7/2 light gray very fine sandy silt. It is a water deposited stratum. No layering was visible within it, indicating that it may have been deposited in a single episode, possibly during a large flood. Without a doubt, seasonal flooding in the area has increased since construction of the Wax Lake Outlet; this may suggest Stratum II was deposited subsequent to construction of the outlet.

Stratum III contained a 10YR 4/1 dark gray clayey silt loam mixed with organics. It covered the bottom of the visible trench. Its soils were very similar to those in Stratum IV, which contained 10YR 4.5/1 dark gray silty clay. Stratum IV was an undifferentiated topsoil that included both the originai topsoil surrounding the ditch and the spoil excavated from the ditch during construction. No visual or textural distinction between the two has survived.

Strata V and VI are Mississippi River deposits which underlie the entire area. Strata V is comprised of 10YR 5/3 brown silty clay mottled with 10YR 3/1 very dark gray silty clay. The underlying Stratum VI is a 5Y 5/2 olive gray very fine sandy silt clay mixed with 10YR 5/6 yellowish brown silty clay.

A number of artifacts were recovered from Trench 1, including a small fragment of redware, aqua bottle glass, a cut nail, a chain fragment, and an iron hook. The aqua bottle glass and the redware were recovered from Stratum V, and they probably were placed in it soon after its original construction, prior to formation of Stratum III. While these artifacts generally date between the mid-nineteenth and early twentieth centuries, they were inadequate to date the construction of the trench. Insufficient data were present within Trench 1 to ascertain whether or not the ditch originally was a Civil War earthworks.

Trench 2 was placed through a magnetic anomaly towards the northeastern end of Area 1 (Figure 48). Its southwest corner was located at N1979, E884. A shallow ditch was visible on the surface, and the excavated trench bisected that ditch. Three soil strata were observed within Trench 2 (Figure 51). Stratum I, a 10YR 3/1 very dark gray clayey silt, was the topsoil deposit. Stratum II contained very thin lamellar layers of 10YR 7/2 light gray very fine sandy silt with occasional bands of 10YR 5/3 brown silty clay. As with Stratum II within Trench 1, this water deposited layer may have occurred subsequent to construction of the Wax Lake Outlet. The profile of the field drainage ditch is visible within the stratum. The basal stratum, Stratum III, contained 10YR 5/3 brown silty clay mottled with 10YR 3/1 very dark gray silty clay and 10YR 5/1 gray silty clay. One wire nail was recovered from Stratum III. In addition, a 20 lb Parrott shell fragment from the Bisland battle was recovered from 2 m southwest of the trench.



I: 10YR 3/2 VERY DARK GRAYISH BROWN SILT LOAM.

II: 10YR 5/3 BROWN VERY FINE SANDY SILT MIXED WITH 10YR 7/2 LIGHT GRAY VERY FINE SANDY SILT.

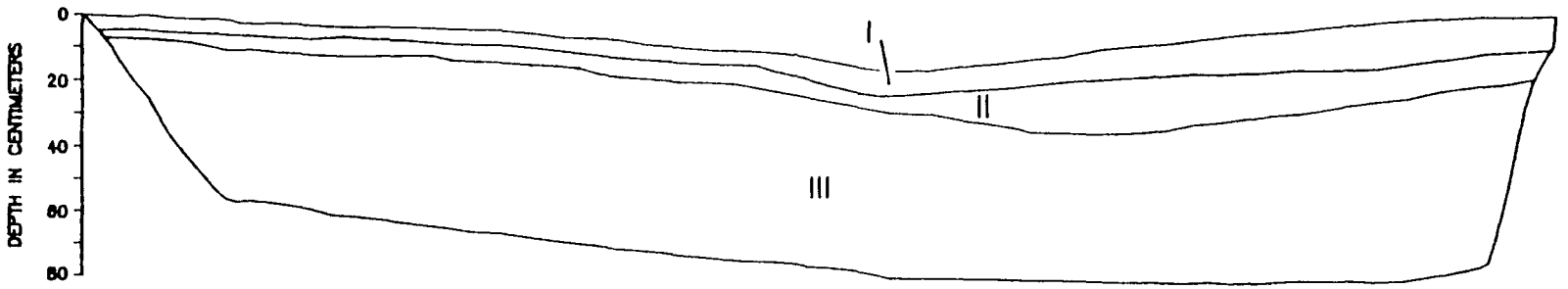
III: 10YR 4/1 DARK GRAY CLAY SILT LOAM WITH ORGANICS.

IV: 10YR 4.5/1 DARK GRAY SILTY CLAY.

V: 10YR 5/3 BROWN SILTY CLAY MOTTLED WITH 10YR 3/1 VERY DARK GRAY SILTY CLAY.

VI: 5Y 5/2 OLIVE GRAY VERY FINE SANDY SILT CLAY MIXED WITH 10YR 5/6 YELLOWISH BROWN SILTY CLAY.

Figure 50. Stratigraphic Profile of the north wall of Trench 1, Segment W-112, Area 2.



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

II: VERY THIN LAMELLAR LAYERS OF 10YR 7/2 LIGHT GRAY VERY FINE SANDY SILT WITH OCCASIONAL 10YR 5/3 BROWN SILT CLAY BANDS.

III: 10YR 5/3 BROWN SILT CLAY MOTTLED WITH 10YR 3/1 VERY DARK GRAY SILT CLAY AND 10YR 5/1 GRAY SILT CLAY.

Figure 51. Stratigraphic Profile of the north wall of Trench 2, Segment W-112, Area 2.

Summary

During field investigations along Bayou Teche and the Wax Lake Outlet, seven archeological sites were identified and recorded. These sites included four postbellum and early twentieth century sites associated with sugar and rice production along the Teche. Moro Plantation (16SMY73), Luckland Plantation (16SMY71), and Avalon Plantation (16SMY70) were predominantly sugar plantations, and included remains of tenant farmer residences and dependencies. Luckland Plantation and Avalon Plantation also contained remains of postbellum sugar houses. Zenor (16SMY72) contained four brick scatters and one small foundation remains, which possibly was part of a pumphouse. Two of the other sites were antebellum sites with postbellum components. Bethel I (16SMY68) was the probable location of an antebellum sugar house and a brick kiln. Bethel II (16SMY69) consisted of a large brick scatter, and of both antebellum and postbellum artifact scatters. Finally, Calumet (16SMY67) is the remains of two twentieth century structures towards the western end of the project area.

Testing also was conducted along the Wax Lake Outlet, within the Bisland battlefield (16SMY166). This testing demonstrated that most of the W-112 levee segment was covered with 2 to 3 m of dredged material. Within the remaining part of the segment, a tram bed, several agricultural field ditches, a remnant protection levee, and the possible remains of a Civil War trench were recorded. Testing of the possible trench failed to prove whether or not it was a Civil War trench.

CHAPTER VIII

LABORATORY ANALYSIS

Introduction

A total of 1,363 historic artifacts, 12 prehistoric ceramic sherds, and 148 ecofacts (including 145 animal bones), and 19 miscellaneous non-artifactual materials (e.g., shell, charcoal, and stone) were recovered from eight sites and four non-site segment areas during archeological investigations of Fort Bisland and Lower Bayou Teche. Sites included Moro Plantation (16SMY73) and Zenor (16SMY72) in segment 1; Luckland Plantation (16SMY71) in Segment 2; Avalon Plantation (16SMY70) in Segment 3; Bethel II (16SMY69) in Segment 5; Bethel I (16SMY68) in Segment 6; Calumet (16SMY67) in Segment 8; and, Bisland (16SMY166) in Segment 9. Of the 1,542 artifacts and ecofacts collected, only 29 artifacts and 1 animal bone were found in non-site segment areas. These areas represent isolated finds in Segment 4, an area in which no sites were recorded, as well as in Segments 5, 8, and 9. The remaining 1,512 artifacts and ecofacts were recovered from Moro Plantation (26 artifacts and two ecofacts), Zenor (334 artifacts and 10 ecofacts), Luckland Plantation (207 artifacts and five ecofacts), Avalon Plantation (141 artifacts and 21 ecofacts), Bethel II (131 artifacts), Bethel I (466 artifacts and 123 ecofacts); Calumet (23 artifacts and five ecofacts), and Bisland (18 artifacts).

Artifacts were washed and sorted by material category, and then cataloged and encoded into a computerized site catalog to allow further manipulation of the data. The computerized site catalog is organized by category, functional group, type, and subtype. The first level, **category**, is based on the format used by the Louisiana Division of Archaeology. The second level, **functional group**, is based on classifications established by South (1977). The third and fourth levels, **type**, and **subtype**, are defined by diagnostic attributes. South's (1977) classifications do not apply to prehistoric remains. The few prehistoric ceramic sherds recovered were sorted by temper, portion of vessel, and surface finish. Sherds were analyzed using types previously identified by Phillips (1970).

The following discussion describes the artifacts recovered from the eight sites and from the non-site segment areas. Tables 4 through 11 list the materials collected from the eight sites. Table 12 lists chronological information pertaining to ceramics, glass, and nails. Table 13 contains attribute data recorded for the 18 whole and partial bricks collected from the sites; attribute data include length, width, thickness, Munsell color designations, hardness values derived from the Mohs test, presence or absence of glaze or mortar, and brick brands. Information concerning various brick forms and functions was obtained from Gurcke (1987).

Table 4

MATERIAL RECOVERED FROM SITE 16SMY73, MORO PLANTATION

	Shovel Tests
Ceramic Materials	
Whiteware	
Plain	4
Flow blue	1
Transfer printed	1
Yelloware	
Ginger beer bottle lip	1
Faunal (Non-human)	
Unidentified bone	1
Unidentified tooth	1
Glass	
Window glass	1
Unidentified bottle glass	
Amethyst	1
Dark green	1
Olive	1
Metal	
Iron Wire	3
Nails	
Cut	3
Wire	1
Unidentified	7
Unidentified furniture metal	1
Total	**28**

Table 5

MATERIAL RECOVERED FROM SITE 16SMY72, ZENOR

	Brick Scatter A			Brick Scatter B	Brick Scatter C	Brick Scatter
	Surface Collection	Unit 1	Unit 3	Unit 2	Shovel Tests	Shovel Tests Along Rays
Ceramic Materials						
Porcelain						
Button	1	2	1		1	
Thimble fragment			1			
Stoneware						
Domestic brown, unidentified						1
Whiteware						
Plain		6		9	6	5
Molded				6		
Dipped/annular				1		
Decalcomania and handpainted						1
Decalcomania				1		
Polychrome handpainted						1
Transfer printed				1		
Ironstone						
White, undecorated				2	1	
Yelloware						
Dipped/annular						
Ginger beer bottle						
Kaolin molded bowl fragment				1		

	Brick Scatter A			Brick Scatter B	Brick Scatter C	Brick Scatter
	Surface Collection	Unit 1	Unit 3	Unit 2	Shovel Tests	Shovel Tests Along Rays
Construction Materials						
Fire brick, whole	1					
Fire brick, partial	1	2	1			
Stiff-mud brick, partial		1				
Soft-mud brick, whole		1				
Mortar		10	4	1		
Limestone						1
Other				2		1
Faunal (non-human)						
Unidentified bone				2	1	2
Glass						
Blow in mold						
Amethyst						1
Aqua				1	1	
Clear					1	
Lip, tooled						
Aqua						1
Lip, applied						
Aqua				1	1	
Lamp glass						
Clear		4	1		1	
Table glassware						
Amethyst				1		1
Window glass			1	2	1	

	Brick Scatter A					
	Surface Collection	Unit 1	Unit 3	Brick Scatter B Unit 2	Brick Scatter C Shovel Tests	Brick Scatter Shovel Tests Along Rays
Pharmaceutical						
Aqua				5		
Clear				1		
Unidentified						1
Unidentified Molded Technique						
Amethyst						1
Aqua				1		
Unidentified bottle glass						
Amber				3		
Aqua		2		11	3	
Clear	1	2				
Light Green	1					
Dark green				3	2	
Olive				1		
Panel bottle fragment		1				
Unidentified glass						
Amber					1	
Amethyst		1		2	2	1
Aqua				3		
Clear		3		5	4	1
Green						1
Metal						
Bolt		1				
Iron eye		1				
Iron wire				4		
Spike				2		
Staple		1			1	
Tin can		1		1		
Miscellaneous wagon/carriage part				1		

	Brick Scatter A			Brick Scatter B	Brick Scatter C	Brick Scatter Shovel Tests
	Surface Collection	Unit 1	Unit 3	Unit 2	Shovel Tests	Along Rays
Nails						
Cut		30	10	55	18	2
Wire		3	9		2	1
Unidentified		2	1	4	1	
Unidentified metal objects		5	2[1]	12	2	6
Shell						
Rangia cuneata		1				
Unidentified fragment		1				
Wood						
Charcoal		1				
Stone						
Coal		2				
Total	5	84	31	145	50	29

KEY

1 = Feature 2 fill

Table 6

MATERIAL RECOVERED FROM SITE 16SMY71, LUCKLAND PLANTATION

	Surface Collection	Shovel Tests
Ceramic Materials		
Porcelain		
Undecorated, hard		5
Overglaze, soft		1
Pearlware		
Plain		1
Whiteware		
Plain		28
Molded		3
Molded, colored glaze		1
Overglaze, handpainted		1
Dipped/annular		1
Sponged		1
Transfer printed		1
Unidentified decoration		1
Yelloware		
Plain		1
Earthenware marble		1
Prehistoric ceramic body sherds		2
Construction materials		
Fire brick, whole	2	
Fire brick, partial	1	
Roofing slate		4
Floral		
Unidentified seed		1
Faunal (non-human)		
Unidentified bone		4
Glass		
Blown in mold		
Aqua		3
Clear		1
Light green		1

	Surface Collection	Shovel Tests
Machine-made bottle		
Amethyst		1
Clear		3
Lip, tooled		
Aqua		1
Lamp glass		
Clear		5
Table glassware		
Pressed, clear		1
Button, milk glass		1
Window glass		2
Unidentified bottle glass		
Amber		5
Amethyst		4
Aqua		4
Clear		15
Light green		1
Milk glass		1
Olive		1
Pressed, aqua		1
Metal		
Bolt		3
Bullet, modern		1
Copper washer		1
Iron wire		9
Slag		2
Spike, cut		1
Nails		
Cut		36
Wire		17
Unidentified		23
Unidentified handle		1
Unidentified hardware		6
Unidentified metal objects		1
Total	3	**209**

Table 7

MATERIAL RECOVERED FROM SITE 16SMY70, AVALON PLANTATION

	Shovel and Auger Tests	Surface Collection
Ceramic Materials		
Porcelain		
Undecorated, hard	3	
Stoneware		
Domestic gray, unidentified	1	
Domestic brown, albany slip on buff	1	1
Whiteware		
Plain	12	4
Dipped/annular	1	
Flow blue		1
Transfer printed	2	
Ironstone		
Dipped/annular		1
Yelloware		
Rockingham/bennington	1	
Stoneware drainage pipe		1[1]
Prehistoric ceramic body sherds	8	
Construction Materials		
Fire brick, whole		4[1]
Soft-mud brick, whole		1[1]
Soft-mud brick, partial		1[1]
Mortar	1	
Faunal (non-human)		
Unidentified bone	19[2]	
Glass		
Blown in mold		
Aqua		1
Cup bottom mold		
Amethyst	1	
Machine-made bottle		
Amber	1	
Clear	4	
Dark green		1[1]

	Shovel and Auger Tests	Surface Collection
Table glassware		
Amethyst	1	
Cobalt blue	1	
Lamp glass		
Clear	1	
Glass stopper		
Amber	1	
Glass aqua tube	1	
Window glass	8	
Unidentified bottle glass		
Amber	1	
Amethyst	1	1
Aqua	6[2]	
Clear	9	1
Cobalt blue	1	
Dark green		8
Olive	5	
Metal		
Iron band/strap	1	1
Metal toy	1	
Nut	1	
Slag	2	
Washer	2	
Nails		
Cut	16	
Wire	2	
Unidentified	11	
Unidentified metal objects	4	
Shell		
Oyster	1	
Stone		
Coal	1	
Other		
Unidentified synthetic object	1	
Total	**135**	**27**

KEY

1 = Sugar house area 2 = One from auger test

Table 8

MATERIAL RECOVERED FROM SITE 16SMY69, BETHEL II

	Shovel Tests	Surface Collection Antebellum Ceramic Sherd Concentration	Surface Collection West 100 m
Ceramic Materials			
Porcelain			
Molded, hard			1
Pearlware			
Plain		3	
Scalloped rim, impressed curved lines		3	
Embossed patterns		4	
Embossed with overglaze handpainting		1	
Willow transfer printed		11	
Transfer printed		18	
Whiteware			
Plain		2	
Dipped/annular		7	3
Scalloped rim, impressed curved lines		4	
Willow transfer printed		8	
Transfer printed		19	
Polychrome handpainted		2	
Blue handpainted		1	
Colored glaze			2
Whiteware/Ironstone			
Plain			2
Yelloware			
Plain			2
Dipped/Annular			1
Redware			
White slipped and clear glazed		1	
Clear glazed, plain		1	
Cream colored earthenware, plain		3	
Unidentified ceramic sherds			
Burnt white body			1
Kaolin tobacco pipe stem fragments		2	
Prehistoric ceramic sherd, eroded		1	

	Shovel Tests	Surface Collection Antebellum Ceramic Sherd Concentration	Surface Collection West 100 m
Construction Materials			
Brick fragment		1	
Glass			
Free blown			1
Dark green			
Blown in mold			
Amber			1
Aqua		1	2
Dark green			1
Machine-Made Bottle			
Clear	1		
Green	1		
Lip Tooled			
Amber			1
Light green			1
Table Glassware			
Amethyst	1		
Unidentified Molded Technique			
Aqua			1
Unidentified Bottle Glass			
Amber			2
Aqua	1		1
Cobalt blue			1
Light green			5
Green	2		1
Dark green		1	
Metal			
Bracket			1
Total	**6**	**94**	**31**

Table 9

MATERIAL RECOVERED FROM SITE 16SMY68, BETHEL I

	Surface Collection	Shovel Tests	Trench 1	Trench 2	Unit N685, E1446 Feature 1	Unit N685, E1446	Unit N676, E1404	Unit N630, E1467 Feature 1	Unit N630, E1467
Materials collected									
Porcelain									
Undecorated, soft		1					1		
Button						3	1		
Stoneware									
Domestic gray, salt glazed and albany slip							1		
Domestic brown, undecorated salt glazed		1							
Pearlware									
Plain						1			
Unscalloped rim, impressed lines						1			
Whiteware									
Plain	3	5	2			20	1		4
Scalloped rim, impressed straight lines						1			
Embossed patterns						1			
Sponged						2			
Sponged and handpainted						2			
Blue handpainted						2			1
Molded						1			
Whiteware/Ironstone									
Plain	1								
Ironstone									
White undecorated	2					1	2		
Handpainted	1								
Yelloware									
Dip; ad/annular					1	2	2		

	Surface Collection	Shovel Tests	Trench 1	Trench 2	Unit N685, E1446 Feature 1	Unit N685, E1446	Unit N676, E1404	Unit N630, E1467 Feature 1	Unit N630, E1467
Redware									
Clear glazed							1		
Bisque doll part							1		
Construction Materials									
Fire brick, partial			1[1]						
Brick fragments		1			8	1	2		
Mortar							3		
Floral									
Unidentified seeds							2		
Faunal (non-human)									
Unidentified bone					21	60	2		
Unidentified tooth						2	4		
Unidentified burned bone					12	8			
Shoe leather fragments							5		
Glass									
Blown in mold									
Aqua			8		1				
Clear					1		4		
Light green							1		
Dark green			1	1	1				
Full height, 3 part, dip									
Mold									
Dark green	1								
Lip, tooled									
Amethyst			1						
Dark green			1						
Iron pontil base									
Dark green		2							
Machine-made bottle									
Aqua							1		

	Surface Collection	Shovel Tests	Trench 1	Trench 2	Unit N685, E1446 Feature 1	Unit N685, E1446	Unit N676, E1404	Unit N630, E1467 Feature 1	Unit N630, E1467
Table glassware									
Clear						1	2		1
Scalloped edge					1				
Window glass		1				1	47		
Button									
Jet-Black							1		
Contact mold									
Milk glass	1								
Non machine-made lip									
Aqua						1			
Melted glass									
Clear							1		
Unidentified bottle glass									
Amber						1	2		
Amethyst		1					4		
Aqua		5				3	15		2
Clear		3		1	4	3	38		
Light green						2	4		1
Green						2	3		
Dark green		1				4	4		
Olive							2		
Milk glass						1	2		
Molded							1		
Pressed		1				1			
Metal									
Chain							1		
Door knob							1		
Padlock			1						
20 lb Parrott shell fragment			1						
Pocket knife			1						
Iron pot fragment				1[2]		1			

	Surface Collection	Shovel Tests	Trench 1	Trench 2	Unit N685, E1446 Feature 1	Unit N685, E1446	Unit N676, E1404	Unit N630, E1467 Feature 1	Unit N630, E1467
Shot gun shell, centerfire							2		
Spike				1[2]					
Suspender part							2		
Slag					2		8	1	
Miscellaneous hardware						2			
Nails									
Cut		3		1[2]	37	28	11	1	
Wire					3		1		
Unidentified		1			2	5	34		
Wagon parts				1[2]					
Unidentified metal object		4		3[2]	10		13		
Shell									
Rangia cuneata						1	1		
Oyster							1		
Unidentified fragment							1		
Stone									
Cinder					1				
Coal						1			
Quartz pebble							2		
Flint flake							1		
Unidentified stone							2		
Wood									
Charcoal									1
Total	9	30	17	9	105	166	241	2	10

KEY

1 = From feature 2 = From metal detector survey

Table 10

MATERIAL RECOVERED FROM SITE 16SMY67, CALUMET

	Surface Collection	Shovel Tests	Metal Detector Survey
Ceramic Materials			
Stoneware			
Domestic gray, bristol glaze		1	
Whiteware			
Plain		5	
Molded		1	
Construction Materials			
Fire brick, partial		1	
Faunal (Non-human)			
Unidentified bone		5	
Glass			
Lip, tooled			
Aqua		1	
Unidentified Bottle Glass			
Amber		1	
Aqua		1	
Clear		2	
Metal			
Ironbar		1	1
20 lb Parrott shell fragment		1	
Unidentified hardware			1
Unidentified nail fragment		2	
Unidentified metal object(s)	1	3	
TOTAL	**1**	**25**	**2**

Table 11

MATERIAL RECOVERED FROM SITE 16SMY166, BISLAND

	Metal Detector Survey	Trench 1	Trench 2
Ceramic Materials			
Redware			
Clear glazed		1	
Glass			
Blow in Mold			
Aqua		3	
Unidentified bottle glass			
Aqua		3	
Metal			
Chain	1	1	
Handwrought hook		1	
Cut spike	1		
20 lb Parrott shell fragment			1
Shotgun shell, centerfire		1	
Nails			
Cut	1	1	
Wire			3
TOTAL	3	11	4

Table 12

CHRONOLOGY OF CERAMIC TYPES, GLASS TYPES, AND NAILS RECOVERED WITHIN THE SURVEY AREA

Material Type	Use Popularity Date Range	Mean	Date Source
CERAMIC WARE AND DECORATION			
Porcelain			
Button	post 1840		Hinks 1988
Stoneware			
Domestic gray, salt glazed and albany slipped	1810-1900	1855	Goodwin, Yakubik et al. 1984
Domestic brown, albany slip on buff	1810-1900	1855	Goodwin, Yakubik et al. 1984
Pearlware			
Plain	1780-1830	1805	South 1977
Willow transfer printed	1795-1840	1818	South 1977
Transfer printed	1795-1840	1818	South 1977
Whiteware			
Plain	1820-1900+		South 1977
Dipped/annular	1820-1890	1855	Ramsay 1947; South 1977
Flow blue	post 1840		Miller 1988[1]
Transfer printed	post 1820		Miller 1989[1]
Sponged	ca. 1850s-1920s		Miller 1988[1]
Whiteware/Ironstone			
Plain	1813-1900+		Goodwin, Yakubik et al. 1984
Ironstone			
White, undecorated	post 1845		Miller 1989[1]
Yelloware			
Plain	1830-1900	1865	Ramsay 1947
Dipped/Annular	1830-1900	1865	Ramsay 1947
Rockingham/bennington glaze	1830-1900	1865	Ramsay 1947
Ginger beer bottle	1830-1900	1865	Ramsay 1947
Decorative Techniques (Pearlware and Whiteware)			
Decalcomania	post 1880		Pittman 1987
Scalloped rim, impressed curved lines	1795-1845		Miller n.d.
Scalloped rim, impressed straight lines	1795-1840		Miller n.d.
Unscalloped rim, impressed lines	1825-1891		Miller n.d.
Embossed patterns	1820-1845		Miller n.d.

Material Type	Use Popularity Date Range	Mean	Date Source
Diagnostic Glass Attributes			
3-piece shoulder height mold	1820s-1900[2]		Jones and Sullivan 1985
Lip, tooled	1820s-1920s		Jones and Sullivan 1985
Iron pontil	1845-1875	1860	Munsey 1970
Machine-made bottle	post 1920		Munsey 1970
Amethyst color	ca. 1875-1920		Jones and Sullivan 1985
Nails			
Cut	1815-1890	1853	Nelson 1968
Wire	post 1890		Nelson 1968

KEY

1 = Personal Communication 2 = For liquor bottles

Table 13

BRICKS RECOVERED BY SITE WITHIN THE SURVEY AREA

Brick No.	Length (cm)	Width (cm)	Thickness (cm)	Munsell	Hardness (Mohs Scale)	Glazing	Mortar	Brick Brands	Comments
Zenor									
1	------	10.0	5.8	5Y 3/1 Very dark gray	5.0	------	------	"... & SONS"	Fire brick
2	------	9.5	5.9	5YR 5/4 Reddish brown and 10YR 6/3 pale brown	4.5	------	------	"...MBLE"	Fire brick
3	------	10.5	6.5	10YR 8/3 Very pale brown	4.5	------	Present	"J.S..."	Fire brick
4	------	10.9	6.2	10YR 8/4 Very pale brown	4.5	------	Present	"MIS[SOURI] X[XX]"	Fire brick
5	------	10.3	5.7	10R 5/6 Red	3.0	------	Present	------	Stiff-mud brick
6	21.0	9.7	5.5	2.5YR 6/4 Light reddish brown	3.5	------	Present	------	Soft-mud brick
7	------	11.0	5.9	10YR 7/4 Very pale brown	3.5	------	Present	"[P.R.M] M CO [NO] 1"	Fire brick
Luckland Plantation									
8	21.6	10.1	6.0	10YR 7/4 Very pale brown	5.5	------	Present	"W.B. FREEMAN"	Fire brick
9	------	9.8	6.1	5Y 6/3 Pale olive	5.5	Present	Present	"...AGLE"	Fire brick
10	22.2	10.6	6.1	10YR 8/6 Yellow	4.5	------	Present	"P.R.M&M CO NO 1"	Fire brick

Brick No.	Length (cm)	Width (cm)	Thickness (cm)	Munsell	Hardness (Mohs Scale)	Glazing	Mortar	Brick Brands	Comments
Avalon									
11	22.0	10.5	6.0- 4.0	10YR 8/8 Very pale brown	5.0	----	Present	"LACLEDE CROWN 2" ST. LOUIS	Fire brick, wedge shaped
12	21.0	10.5	6.5	7.5YR 8/2 Pinkish white	4.5	Present	Present	"ST. LOUIS. No. 1"	Fire brick
13	21.5	10.1	6.4	5YR 7/4 Pink and 10YR 8/3 very pale brown	4.5	----	Present	"A.P & Co"	Fire brick
14	21.0	10.1	6.0	7.5YR 8/2 Pinkish white	5.5	----	Present	"J.S P."	Fire brick
15	----	9.5	5.6	10R 6/6 Light red	3.5	Present	Present	"20"	Soft-mud brick; brick brand stamped on end of brick
16	21.6	10.3	6.7	5YR 7/4 Pink	4.0	----	Present	"L&S"	Soft-mud brick
Bethel I									
17	----	10.0	5.8	7.5YR 6/2 Pinkish gray	4.0	Present	Present	----	Fire brick
Calumet									
18	----	10.0	5.3	10R 4/6 Red	6.5	----	Present	----	Possible fire brick; yellow clay inclusions

Moro Plantation (16SMY73)

Twenty-six artifacts and two animal bones were collected during shovel testing at Moro Plantation (Table 4). Historic ceramic types included four plain, one flow blue, and one transfer printed whiteware sherds, as well as one ginger beer bottle lip (Figure 52). Plain whiteware dates from 1820 to 1900+. Flow blue whiteware post dates 1840, and transfer printed whiteware post dates 1820. Ginger beer bottles have a use popularity date range of 1830 through 1900.

The fifteen metal artifacts included three pieces of iron wire, three cut nails, one wire nail, seven unidentified nail fragments, and one unidentified piece of furniture metal. Cut nails date from 1815 to 1890, with a mean date of 1853, while wire nails post date 1890.

One amethyst colored unidentified bottle glass fragment was recovered. Amethyst colored glass dates from ca. 1875 to 1920. This amethyst fragment had the letter "...N..." embossed on it. Two additional unidentified bottle glass fragments were recovered as was a window glass fragment. One animal bone and tooth also were collected.

Most of the artifacts recovered from Moro Plantation date from the late nineteenth to early twentieth centuries. Some of the artifacts, such as the ginger beer bottle lip, the flow blue whiteware, and the transfer printed whiteware, suggest an earlier antebellum origin.

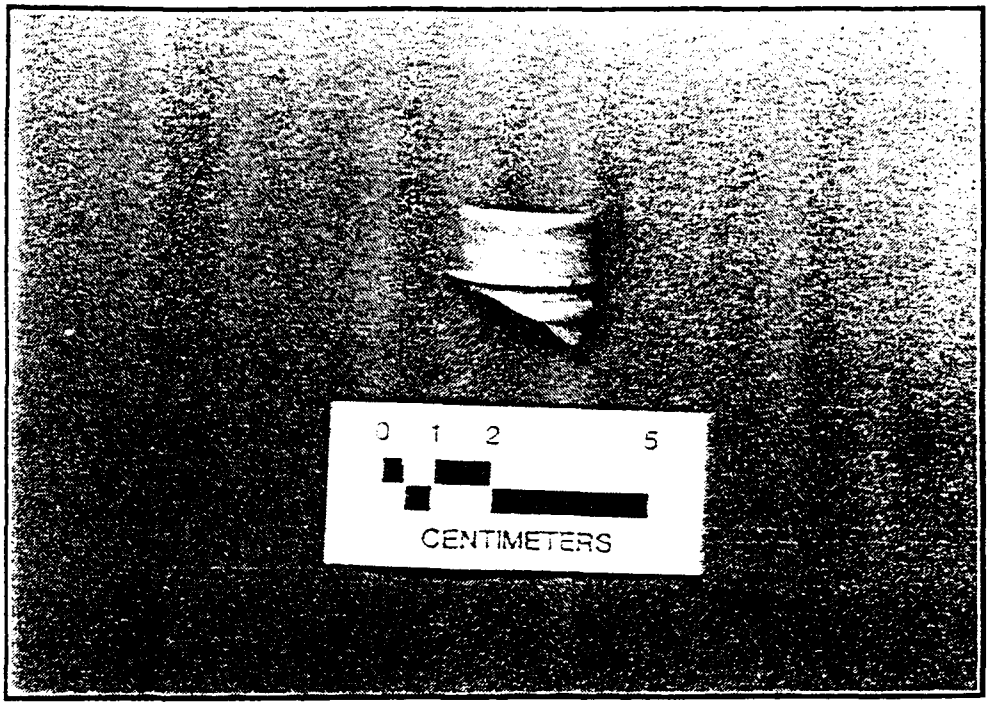
Zenor (16SMY72)

A total of 334 historic artifacts, including seven bricks, five ecofacts, and five miscellaneous non-artifactual materials were recovered during surface collection, shovel testing, and excavation of three 1 x 2 units (Tables 5 and 13). Four brick concentrations, designated A, B, C, and D, were discovered during survey; each is discussed separately.

Scatter A

Surface collection at Scatter A produced one porcelain button, two pieces of unidentified bottle glass, and two partial fire bricks. The porcelain button post dates 1840. Both bricks were stamped with incomplete brands; Brick 1 was marked "...& SONS", and Brick 2 was marked "...MBLE" respectively.

Two 1 x 2 units were excavated in Scatter A. Unit 1 produced 79 historic artifacts and five ecofacts. Unit 1, Stratum I, included one plain whiteware sherd, six glass sherds, including a piece of lamp glass, one fragment of unidentified amethyst glass, two clear and one aqua unidentified bottle glass fragments, and a panel bottle glass fragment. Seventeen metal artifacts collected included one staple, one bolt, nine cut nail fragments,



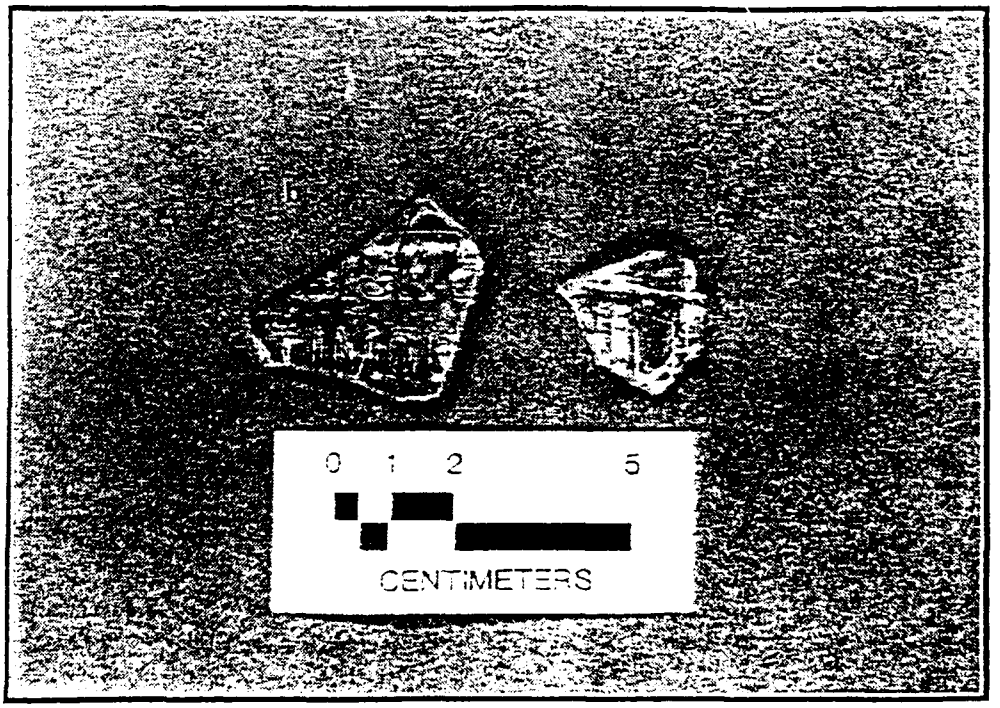


Figure 52. From 16SMY73 (Moro Plantation) - (a) ginger beer bottle lip (Transect 2, Shovel Test 2). From 16SMY71 (Luckland Plantation) - (b) unidentified clear bottle glass fragment from a McCormick & Co. of Baltimore bottle (Transect 3, Shovel Test 5); (c) clear blown in mold glass fragment from an E. W. Hoyt & Co. cologne product bottle (Transect 2, Shovel Test 2).

three wire nail fragments, and three unidentified metal fragments. Seven pieces of mortar, one wood charcoal fragment, two partial fire bricks (bricks three and four), and a partial stiff mud brick (brick five) also were collected from Unit 1. Mortar was present on all three bricks, and both fire bricks were stamped with partial brick brands. "J.S...." was stamped on Brick 3, while "MIS[SOURI]/X[XX]...," was branded on Brick 4. Brick 4 was manufactured by the Missouri Fire Brick Co., Mo., and dates from 1927 to 1930 (Gurcke 1987).

Two mortar fragments and one unidentified nail fragment were collected from Stratum II of Unit 1. Stratum III was situated near Feature 1, an in situ brick foundation. Artifacts from this stratum included two porcelain buttons, three lamp glass fragments, two clear and one aqua unidentified bottle glass fragments, one iron eye, one tin can fragment, two unidentified metal objects, 21 cut nail fragments, and one unidentified nail fragment. Two pieces of coal, one mortar fragment, one *Rangia cuneata* shell, one unidentified shell fragment, and one whole soft-mud brick (Brick 6), also were recovered. Brick 6 exhibited traces of mortar; there was no brand stamp. Stratum IV of Unit 1 contained five plain whiteware sherds and one clear, unidentified glass fragment.

Thirty-one historic artifacts were recovered from Unit 3, including two from Feature 2, a possible postmold associated with Feature 1. Stratum I contained one porcelain button, and one possible porcelain thimble fragment. One piece of window glass, one clear lamp glass fragment, four mortar fragments, four cut nails, four wire nails, and one unidentified nail fragment also were collected. Stratum II yielded six cut nail fragments and five wire nail fragments; one partial fire brick (Brick 7), branded "[P.R.M]& M CO/[NO] 1" also was collected from Stratum II. This brick was manufactured by the Parker-Russell Mining & Mfg. Co., Mo., and dates from 1927 to 1930 (Gurcke 1987). In addition, two unidentified metal fragments were collected from Feature 2. The presence of wire nails, amethyst glass, and fire brick dating from the twentieth century suggests that Features 1 and 2 date from the late nineteenth century to the early twentieth century.

Scatter B

One hundred forty-three artifacts and two animal bones were collected from one 1 x 2 m excavation unit, designated Unit 2. Stratum I of Unit 2 contained 138 historic artifacts and two unidentified animal bones. The 138 artifacts included eighteen whiteware sherds, two white undecorated ironstone sherds, and one molded kaolin bowl fragment embossed with "[T] D". Whiteware consisted of eight plain, six molded, one dipped/annular, one decalcomania printed, and one transfer printed ware. Dipped/annular whiteware was popular from 1820 to 1890, with a mean date of 1855. Decalcomania printed patterns on pearlware and whiteware post date 1880. White, undecorated ironstone post dates 1845. Six pharmaceutical glass fragments, two pieces of window glass, one amethyst table glassware fragment, one aqua blown in mold glass fragment, an aqua applied bottle lip, one aqua unidentified molded technique glass fragment, seventeen unidentified bottle glass sherds, and ten pieces of unidentified glass

also were collected. Five of the pharmaceutical glass fragments retain a portion of "Mexican Mustang/Liniment" embossment; this product was manufactured by George W. Westbrook, St. Louis, Mo. and dates from ca. 1825 to 1948 (Fike 1987). Metal artifacts included four iron wire fragments, one wagon/carriage part, 1 spike, 53 cut nail fragments, four unidentified nail fragments, and 12 unidentified metal objects. Three construction material fragments, including mortar, also were collected. Stratum II of Unit 2 contained one plain whiteware sherd, one spike, one tin can fragment, and two cut nail fragments. Scatter B artifacts date from the late nineteenth to early twentieth centuries.

Scatter C

Forty-nine historic artifacts and one unidentified animal bone were collected during shovel testing. The collection included six plain whiteware sherds, one white undecorated ironstone sherd, and one porcelain button. One plain whiteware sherd displayed the partial maker's mark "HOMER LAUGHLIN." This mark resembles the "HOMER LAUGHLIN" mark that has been used since 1879; the mark was registered in 1912, and again in 1956 (Lehner 1988). Two blown in mold glass fragments (one with an unidentified embossment), an aqua applied bottle lip, one piece of clear lamp glass, one window glass sherd, five unidentified bottle glass fragments, and seven unidentified pieces of glass also were recovered during shovel testing. Metal artifacts consisted of one staple, eighteen cut nail fragments, two wire nail fragments, one unidentified nail fragment, and two unidentified metal objects. Scatter C artifacts date from the late nineteenth to the early twentieth centuries.

Scatter D

Shovel testing along four rays produced 27 historic artifacts and two unidentified animal bones. Eight historic ceramic sherds were collected, including one piece of unidentified domestic brown stoneware, five plain whiteware sherds, one decalcomania printed and handpainted whiteware sherd, and one polychrome handpainted whiteware sherd. One amethyst colored blown in mold glass fragment, one aqua tooled bottle lip, one amethyst table glassware fragment, and one unidentified piece of pharmaceutical glass also were recovered. The fragment of amethyst colored blown in mold glass was embossed with "...AR..." Tooled bottle lips date from the 1820s to 1920s. Three unidentified glass fragments and one piece of amethyst with an unidentified mold technique glass also were recovered. Metal artifacts included two cut nail fragments and one wire nail fragment, and six unidentified metal objects. Two construction materials, including one piece of mortar also were collected. The artifacts date from the late nineteenth to early twentieth centuries. A shallow ditch runs through the scatter; its function is unknown.

Luckland Plantation (16SMY71)

Two hundred and five historic artifacts, two prehistoric ceramic sherds, and five ecofacts were found during surface collection and shovel testing at Luckland Plantation (Table 6). Three fire bricks (Bricks 8 through 10) were collected from the surface (Table 13). Two bricks, Bricks 8 and 9, were found in the sugar house area; Brick 10 was recovered from the fire brick foundation located east of the sugar house. All three bricks exhibited traces of mortar, and Brick 9 was glazed due to its proximity to the kiln fire. Brick 8 is stamped "W.B. FREEMAN" and possibly was manufactured by Freeman Fire Brick Co., WV. his stamp dates from 1921 (Gurcke 1987). Brick 9 exhibits the partial brick stamp "...AGLE", and Brick 10 is marked "P.R.M&M CO/NO 1, a mark that was evident on Brick 7 from Zenor, and which dates from 1927 to 1930 (Gurcke 1987).

The remaining 202 historic artifacts, two prehistoric ceramic sherds, and five ecofacts were recovered from shovel tests. Two very weathered prehistoric grog-tempered ceramic sherds were found. One of the sherds has been classified as Baytown Plain *var. unspecified*; the other appears to be Larto Red *var. unspecified*. Baytown Plain varieties were used throughout much of prehistory, from the Marksville period to European contact. Most of the Larto Red varieties are thought to date from the Baytown period (Phillips 1970). The five ecofacts include four unidentified animal bones and one seed.

The 202 historic artifacts collected include 37 whiteware sherds, 28 of which were plain, three molded, and one each of molded and colored glazed, overglaze handpainted, dipped/annular, sponged, transfer printed, and unidentified decoration. Six porcelain fragments, five hard and one overglaze soft, were collected, as was one fragment each of plain pearlware and plain yelloware. One earthenware marble also was collected. Dipped/annular whiteware was popular from 1820 to 1890, with a mean date of 1855. Sponged whiteware dates from ca.1850 to the 1920s, while plain yellow ware has a use popularity date range of 1830 to 1900, and a mean date of 1865. Pearlware has a use popularity date range of 1780 to 1830, and a mean date of 1805.

Fifty-one glass fragments were collected, including 32 pieces of unidentified bottle glass. Five clear lamp glass fragments, five pieces of blown in mold glass, four machine-made bottle glass fragments, one aqua tooled bottle lip, two window glass fragments, one clear, pressed table glassware fragment, and one milk glass button complete the glass collection. Machine-made bottle glass post dates 1920. One piece of clear blown in mold glass was embossed "...YT'S" followed with a cents mark (Figure 52). This fragment most likely is from a E. W. HOYT & Co. cologne product; the company was founded in 1871 (Fike 1987). Another blown in mold glass fragment, aqua colored, had an unidentified embossment. One unidentified clear bottle glass fragment was embossed with "...MICK/&/...TIMOR...," from McCormick & CO, of Baltimore (Yount 1967) (Figure 52).

One hundred and one metal artifacts were recovered, including 36 cut nail fragments, 17 wire nail fragments, and 23 unidentified nail fragments. Nine pieces of iron wire, three bolts, one copper washer, one modern bullet, one cut spike, and two pieces of slag were collected. Six pieces of unidentified metal hardware, one unidentified metal handle, and one unidentified metal object also were found. Four pieces of roofing slate also were collected.

The artifacts from Luckland Plantation date from the late nineteenth and early twentieth centuries. However, the presence of some pearlware sherds suggests an antebellum origin.

Avalon Plantation (16SMY70)

Shovel testing, auger testing, and surface collections produced 133 historic artifacts, eight prehistoric artifacts, 19 bone fragments, one coal and one oyster shell fragment within the site area (Table 7). One bone fragment originated from an auger test. Eight plain prehistoric ceramic sherds were recovered from a small shell midden; these included seven grog-tempered sherds and one grog and sand-tempered sherd. Six of the seven grog-tempered sherds are possibly Baytown Plain *var. unspecified.* The seventh sherd possibly represents Larto Red *var. unspecified*. The grog and sand-tempered sherd is possibly Baytown Plain *var. Thomas*.

Historic artifacts recovered from shovel tests include fifteen whiteware sherds, including plain, dipped/annular, transfer printed; three undecorated hard porcelain sherds; one unidentified domestic gray stoneware sherd; one domestic brown stoneware sherd with an albany slip; and one Rockingham/Bennington glazed yelloware handle. Domestic brown stoneware with an albany slip dates from 1810 to 1900, with a mean date of 1855. Rockingham/Bennington glazed yelloware dates from 1830 to 1900, with a mean date of 1865. Glass artifacts included one amethyst cup bottom mold, five machine-made bottle glass fragments, two table glassware sherds, one clear lamp glass fragment, one amber glass stopper (Figure 53), one unidentified glass tube, eight pieces of window glass, and 23 fragments of unidentified bottle glass. One unidentified aqua bottle glass fragment was recovered during auger testing. One piece of clear machine made glass, as well as one clear unidentified bottle glass fragment, had unidentified embossments. Cup bottom molds generally date from ca. 1850 to the present (Jones and Sullivan 1985). Machine-made bottle glass post dates 1920.

Metal artifacts from shovel testing included 16 cut nails, two wire nails, 11 unidentified nail fragments, two washers, two slag fragments, one nut, one iron band/strap, one metal toy "jack," and four unidentified metal objects. One mortar fragment and one unidentified synthetic object also were recovered from the shovel tests.

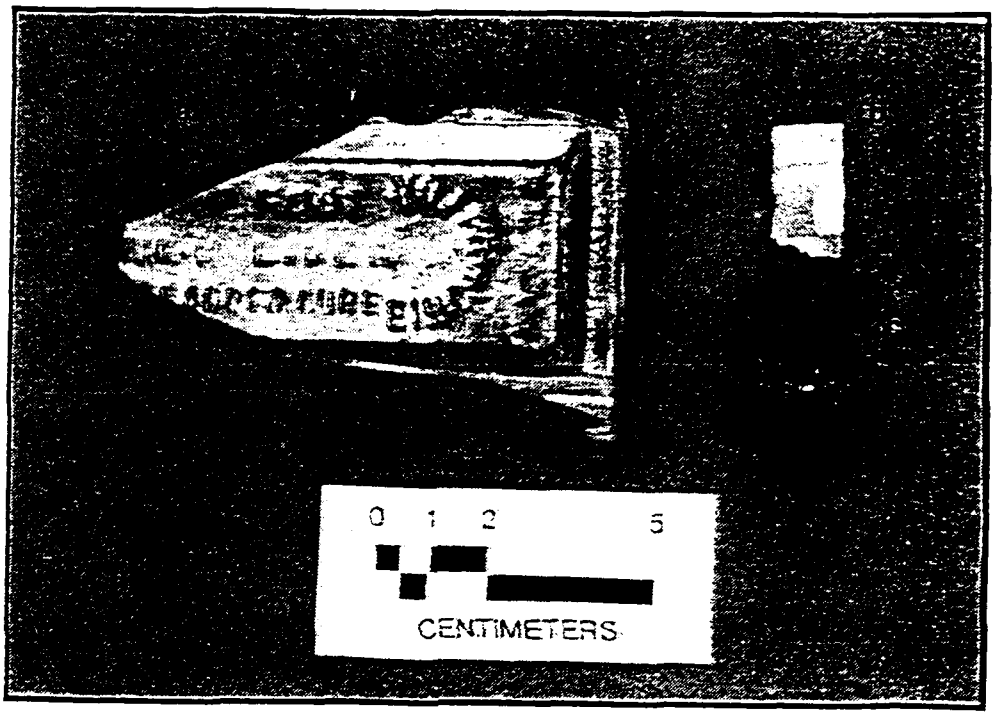


Figure 53. Selected artifacts from 16SMY70 (Avalon Plantation) - (a) aqua blown in mold panel medicine bottle fragment from "Dr. Kilmer's Swamp-Root Kidney Liver & Bladder Cure" of Binghampton, N.Y. (Surface Collection); (b) ironstone with engine-turned decoration (Surface Collection); (c) amber glass stopper (Transect 2, Shovel Test 14)

Surface collection produced four plain and one flow blue whiteware sherds, one domestic brown stoneware sherd with an albany slip, and one dipped/annular ironstone sherd (Figure 53). One stoneware drainage pipe, four whole fire bricks, one partial soft-mud brick, and one whole soft-mud brick were recovered from the sugar house area.

All six Avalon bricks (Brick 11 through Brick 16) exhibited traces of mortar, while Brick 12 and Brick 15 exhibited glazing, due to the proximity to the kiln fire. Brick 14, stamped "J.S.P.," may be the same brand found stamped on Zenor Brick 3. Brick 11 was a wedge-shaped fire brick manufactured by the Laclede-Christy Clay Products Company, in Missouri. A similar brand, "LACLEDE CROWN," was utilized from 1889 to 1942 (Gurcke 1987).

One piece of aqua blown in mold glass, one dark green machine-made glass fragment, 10 unidentified glass fragments, and one iron band/strap also were recovered. The dark green machine-made glass fragment came from the sugar house area. The one piece of aqua blown in mold glass was a panel medicine bottle fragment embossed "[DR. KILMER'S/SWA]MP ROOT/[KID]NEY LIVER/[AND B]LADDER CURE/BINGHAMTON/N.Y. U.S.A." (Figure 53). This product, one of 18 herbal medicines produced by Dr. Kilmer, was the most popular of his medicines. Large-scale marketing and distribution of this product began in 1888, and continued into the twentieth century (Fike 1987). The artifacts collected from Avalon Plantation date from the late nineteenth and early twentieth centuries, with some artifacts possibly originating from an earlier time period.

Segment 4

No sites were located in Segment 4. One unidentified metal object and one eroded grog-tempered prehistoric ceramic sherd were recovered from two separate shovel tests in this segment. The prehistoric sherd was too eroded for type identification.

Segment 5

Surface collection and shovel testing outside of the Segment 5 site area (Bethel II) produced three brick fragments, one transfer printed whiteware sherd, and one very weathered grog and sand tempered plain body sherd. The prehistoric sherd may be Baytown Plain *var. Thomas*.

Bethel II (16SMY69)

Bethel II contains two artifact concentrations, one antebellum and the other postbellum (Table 8). Ninety-three historic artifacts and one prehistoric ceramic sherd

were recovered during surface collection at the antebellum ceramic sherd concentration, while 31 artifacts were collected from the postbellum concentration located in the west 100 m of the site. Six historic artifacts were found in shovel tests within the site area.

Two machine-made bottle glass fragments, one amethyst table glassware fragment, and three unidentified bottle glass fragments were recovered from shovel testing. One of the machine made bottle fragments, a base, had the letter "B" within a circle embossed on it. The mark was used by the Brockway Machine Bottle Co. (1907 - 1933) and the Brockway Glass Co., in business since 1933. The mark postdates 1925 and was copyrighted in 1928 (Toulouse 1971).

Surface collection at the antebellum ceramic sherd concentration produced 40 pearlware sherds, including scalloped rim with impressed curved lines, embossed patterns, embossed patterns with overglaze handpainting, willow transfer printed and other transfer printed wares. Willow transfer printed pearlware as well as other transfer printed pearlware dates from 1795 to 1840, with a mean date of 1818. One transfer printed pearlware sherd was marked "[CL] EWS W[ARRENTED STATFORDSHIRE]" within a circle surrounding a crown in the middle of the mark. This was a makers mark of James & Ralph Clews, Cobridge Works, Cobridge, Staffordshire Potteries. The mark dates from 1818 to 1834 (Godden 1964). The decorative technique of scalloped rims and impressed curved lines on pearlware and whiteware dates from 1795 to 1845. Embossed patterns on pearlware and whiteware date from 1820 to 1845. Plain pearlware was popular from 1780 to 1830, with a mean date of 1805. Forty-three whiteware sherds also were collected; these included willow transfer printed and other transfer printed, dipped/annular, scalloped rim with impressed curved lines, polychrome handpainted, blue handpainted, and plain wares. Vessel forms included plates, teacups, and bowls. Transfer printed whiteware post dates 1820. Two redware sherds and three plain cream colored earthenware sherds, probably from a chamber pot also were found. Plain cream colored earthenware was common from the 1820s to the twentieth century, and represented one of the most inexpensive refined earthenwares available (Miller 1980). Two kaolin tobacco pipestem fragments, one brick fragment, one blown in mold aqua glass fragment, and one unidentified bottle glass fragment complete the historic artifact collection from the antebellum concentration. One prehistoric grog-tempered ceramic sherd also was collected from this concentration. The sherd is too eroded to be assigned a ceramic type.

Thirty-one historic artifacts were collected from the postbellum concentration located in the western 100 m of the site. These included one molded hard porcelain fragment, three dipped/annular and two colored glaze whiteware sherds, two plain and one dipped/annular yelloware sherds, two plain whiteware/ironstone sherds, and one unidentified ceramic burnt white body. Plain whiteware/ironstone has a use popularity date range from 1813 to 1900+. Glass remains included two tooled bottle lip fragments, one possibly free blown dark green glass fragment, four pieces of blown in mold glass, one unidentified molded technique glass fragment, and 10 unidentified bottle glass

fragments. Tooled bottle lips date from the 1820s to the 1920s. One metal bracket also was collected.

Although Bethel II contained both antebellum and postbellum concentrations of artifacts, the entire site is located within a cane field. Plowing may have breached the integrity of this site.

Bethel I (16SMY68)

A total of 589 historic artifacts and ecofacts were recovered during surface collection, shovel testing, and excavation of two backhoe trenches and three 1 x 2 m units at the Bethel I site (Tables 9 and 13). Each of these is discussed separately below.

Surface collection at Bethel I produced nine artifacts, including seven ceramic sherds, one dark green molded partial bottle, and one contact molded milk glass fragment. The ceramic sherds consisted of three whiteware sherds, one whiteware/ironstone sherd, and three fragments of ironstone. One plain whiteware fragment had part of a Royal Arms mark used by Turner, Goddard & Co., of Tunstall, Staffordshire, England. The mark dates from 1867 to 1874 (Korel 1986:12). All of these were undecorated except for one handpainted ironstone sherd. The contact molded fragment is part of a decorated dish or vase. Contact molding is characterized by parallel interior and exterior surfaces, with the interior surface conforming to exterior patterns or embossing. This construction technique was used since Roman times, but with increased frequency after the eighteenth century (Jones and Sullivan 1985:24).

Thirty artifacts were recovered during shovel testing across the site, including seven ceramic sherds, one brick fragment, 13 bottle glass fragments, one window glass fragment, four nails, and four unidentified metal objects. Ceramics, all of which were undecorated, included one soft porcelain fragment, one domestic brown salt glazed stoneware sherd, and five whiteware sherds. Domestic brown salt glazed stoneware generally dates between 1810 and 1900 (Table 12). Although most of the bottle glass was unidentified, two dark green iron pontil base fragments were recovered. The use popularity date range for dark green iron pontil base glass is from 1845 to 1875 (Table 12). Three of the nails collected during shovel testing were cut, while the fourth was unidentified.

A moderate number of artifacts were observed and collected from the two backhoe trenches. Seventeen artifacts were recovered from Trench 1. Those located in the trench back dirt pile included two plain whiteware sherds, a dark green tooled bottle lip, the hasp of a padlock, and a 20 lb Parrott shell fragment from one of the Bisland battles (1862 or 1863). One of the plain whiteware sherds displayed part of a maker's mark, most likely part of a Royal Arms mark (Godden 1964). Artifacts recovered from Strata I and II included a pocket knife, and an amethyst tooled bottle lip. Within the observed feature,

Stratum III artifacts consisted of a partial fire brick (Table 13), a dark green blown in mold bottle glass fragment, and eight fragments of a blown in mold square aqua bottle. This bottle is embossed on one side with "ROY...," and on another side with "L...."

Nine artifacts were collected from Trench 2, all from the back dirt pile. These included one dark green blown in mold bottle glass fragment, one unidentified clear bottle fragment, an iron pot fragment, a spike, one cut nail, an iron wagon strap fragment, and three unidentified iron objects.

Three excavation units were placed across the site. Unit N685, E1446 contained a total of 271 artifacts and ecofacts. The 117 recovered Stratum I artifacts included two pearlware sherds, one with an unscalloped rim with impressed lines; 26 whiteware sherds, including a variety of decorated sherds (Table 9); one white undecorated ironstone, and two dipped/annular yelloware. These ceramic sherds, as an assemblage, probably date from the late antebellum to early postbellum periods. Glass artifacts include one window glass sherd, one clear tableglass sherd, an aqua non-machine made lip, and 15 unidentified bottle glass fragments. Recovered metal artifacts include an iron pot fragment, two pieces of miscellaneous hardware, 23 cut nails and five unidentified nails. Three porcelain buttons (post-1840), and one brick fragment were collected. Ecofacts recovered from Stratum I include 29 animal bone fragments, of which seven were burned; two teeth; and one *Rangia cuneata* shell. One coal fragment also was collected.

Forty-nine artifacts and ecofacts were located within Stratum II of Unit N685, E1446. These included two undecorated whiteware sherds, one whiteware sherd with embossed patterns, two unidentified dark green bottle glass, five cut nails, and 39 bone fragments, one of which is burned.

Feature 1 within Unit N685, E1446, cut through Stratum II, and into the underlying subsoil, Stratum III. It contained 71 artifacts and 34 ecofacts., as well as one cinder. Only one ceramic artifact, a dipped/annular yelloware fragment, was recovered from the feature. Glass artifacts found in the feature included three blown in mold bottle fragments; one table glassware sherd with a scalloped edge; and four unidentified bottle fragments. Forty-two nails were recovered from the feature, including 37 cut nails, three wire nails, and two unidentified nails. Eight brick fragments, two pieces of slag, and ten unidentified metal objects also were collected. Ecofacts located within the feature included 33 animal bone fragments, 12 of which were burned. Based on the presence of wire nails within the feature, it probably dates from the terminal nineteenth or early twentieth centuries.

The second unit excavated, at N676, E1404, contained 241 artifacts and ecofacts. The 134 items recovered from Stratum I included only two ceramic objects: a white undecorated ironstone fragment, and a bisque doll arm or leg fragment. Recovered glass artifacts included 29 window glass sherds, four blown in mold fragments, one fragment of clear table glassware, one melted glass stemware fragment, and 43 unidentified bottle glass fragments. Three of the four blown in mold fragments had unidentified

embossments. Half of a black button also was recovered from the stratum. Metal artifacts included a chain fragment, a shotgun shell base, a suspender button featuring a locomotive surmounted with the designation "UNION," and five unidentified metal objects. Twenty-eight nails also were collected from the stratum, including ten cut nails, and 18 unidentified nails. Two brick fragments and two pieces of mortar were collected from the stratum. Ecofacts recovered from Stratum I included two animal bone fragments, four teeth, one *Rangia cuneata* shell fragment, one unidentified shell fragment, and two seeds. Two unidentified stones and one quartz pebble also were recovered.

Stratum II within Unit N676, E1404, contained 99 artifacts and eight ecofacts. In contrast to Stratum I, these artifacts included a variety of ceramic sherds. Ceramics included one undecorated soft porcelain fragment, one porcelain button, a domestic gray salt glazed stoneware with an albany slip, one undecorated whiteware, one white undecorated ironstone, two dipped/annular yelloware, and one clear glazed redware fragment. Recovered bricks include two brick fragments and one mortar fragment. Glass fragments included 17 window glass sherds, one blown in mold fragment, one machine made bottle fragment, a clear table glassware sherd, and 31 unidentified bottle glass fragments. The machine made bottle fragment may have originated from a Cardui Women's Tonic Bottle, manufactured by the Chattanooga Medicine Company, from 1882 until 1982. Reverend R. I. McElree first produced the product in 1879, and in 1882 sold it to Chattanooga Medicine Company. In 1984, L. D. Ward took over the product from Chattanooga Medicine Company, presently known as Chattem Labs. Since 1985, L. D. Ward has shipped the product in plastic bottles (Fike 1987). Since the Bethel I example is machine made, it postdates 1920. Metal artifacts consisted of part of a door knob assembly, a shotgun shell base, an iron suspender fragment, eight unidentified metal objects, and eight pieces of slag. Eighteen nails also were recovered from the level, including one cut nail, one wire nail, and 16 unidentified nails. Five shoe leather fragments also were recovered. Ecofacts recovered from the stratum included one oyster shell. One flint flake, and one quartz pebble also were recovered. Based on the recovered artifacts, particularly the machine made Cardui tonic bottle fragment, the wire nail, and the shotgun shell base, the stratum dates from the late nineteenth or early twentieth centuries.

The final unit excavated within Bethel I was located at N630, E1467. Only eleven artifacts and one ecofact were recovered from the unit. All of these except for two of the artifacts were located within Stratum I. These included four undecorated whiteware fragments, one blue handpainted whiteware, one clear table glassware, three unidentified bottle glass fragments, and one piece of wood charcoal. Feature 1, represents the remains of a campfire, and it cut through Stratum I. It contained a cut nail fragment, and a piece of slag. The artifacts in the unit generally date from the nineteenth century.

Calumet (16SMY67)

Surface collection, shovel testing, and metal detector survey produced 23 historic artifacts and five animal bone fragments from this site (Tables 10 and 13). One unidentified metal object was recovered during surface collection. Shovel testing produced five plain and one molded whiteware sherd, one bristol glazed domestic gray stoneware sherd, and one possible fire brick (brick 18). Brick 18 exhibited mortar adhesions, and it had yellow clay inclusions. No brick brand was present, and the brick had the highest hardness reading on the Mohs test.

Glass also was found within the shovel tests. One aqua tooled lip and four fragments of unidentified bottle glass were collected. One iron bar, two unidentified nail fragments, one 20 lb Parrott shell fragment (Figure 54), and three unidentified metal objects were found in shovel tests. The five animal bones also were recovered during shovel testing. An iron bar, and one unidentified piece of hardware were collected within the site boundaries during the metal detector survey. In addition, one metal bolt was collected during metal detector survey in Segment 8, outside the site boundaries. The Calumet artifacts, for the most part, are undiagnostic, but they could date from the early twentieth century.

Segment 9

A total of 21 artifacts and one ecofact were recovered from three of the shovel tests placed within Segment 9. These materials included one undecorated whiteware fragment, one window glass fragment, eleven clear machine made bottle glass fragments, one aqua blown in mold glass sherd, one clear unidentified bottle glass fragment, two cut nails, three unidentified nails, one iron construction hardware fragment, and a tooth. The machine made glass fragments, all of which probably came from one bottle, are embossed with "FEDERAL [LAW PROHIBITS SALE OR REUSE OF THIS BOTTLE]." This embossment post-dates 1933 (Pittman 1987:56), when prohibition was repealed. The recovered artifacts generally date from the mid-twentieth century, corresponding to the known ca. 1930s to 1980s occupation of the area.

Bisland (16SMY166)

A total of 18 historic artifacts were recovered during survey and site testing of Bisland (Table 11). One chain, one cut spike, and one cut nail fragment were collected during the metal detector survey of the possible Civil War earthworks. Eleven artifacts also were collected from Trench 1, which bisected the possible Civil War earthworks. The artifacts recovered included one clear glazed redware sherd, three fragments each of blown in mold glass and unidentified bottle glass, one cut nail, one chain fragment, one handwrought iron hook, and one centerfire shotgun shell. However, this artifact collection

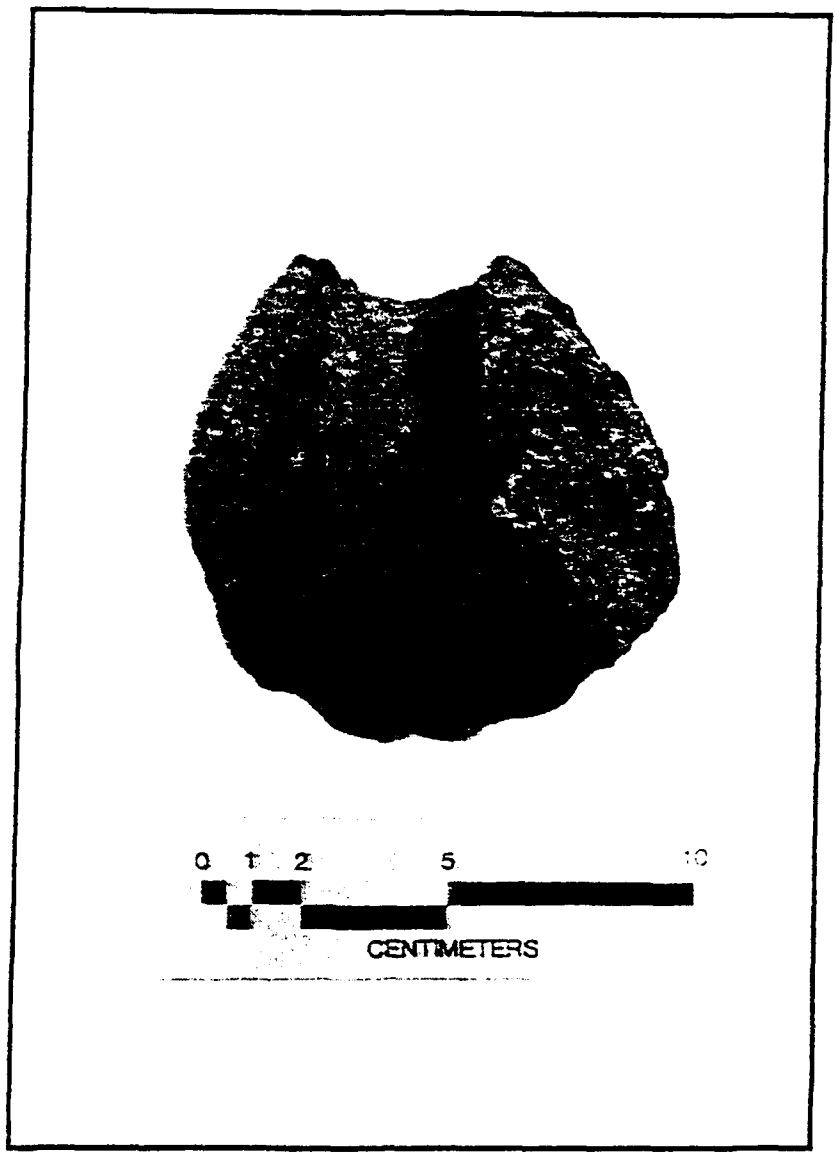


Figure 54. From 16SMY67 (Calumet) - Civil War 20 lb. Parrott shell fragment (Shovel Test N340, E400)

was too incomplete to identify the trench as a Civil War earthwork. Other artifacts collected included three wire nail fragments recovered from Trench 2, and a Civil War 20 lb Parrott shell fragment recovered outside of, but near Trench 2.

CHAPTER IX

RESULTS OF THE RIVERINE MAGNETOMETER SURVEY

Introduction

Underwater archeological investigations designed to locate submerged cultural resources in proposed waterway projects traditionally have included the collection of magnetic and bathymetric survey data. Typically, 50 m lane spacings have been utilized for data collection. Magnetic data gathered during survey then have been analyzed and reduced to a table of anomalies; post plot maps delineating the location of anomalies also have been produced. Preliminary determinations of significance then were formulated and diver investigation was executed on a small sample of the anomalies.

Several problems have been associated with this type of approach. First, lane spacing was not sufficiently tight to locate smaller watercraft, thereby skewing results in favor of larger watercraft. In addition, associated features such as bridges, landings, and other bank and shore related features often were overlooked. Other limitations included a narrow historic orientation focusing solely on wrecks and possibly on bank related features.

Recent investigation of the Atchafalaya River main channel in St. Martin Parish (Pearson and Saltus 1989) for the U.S. Army Corps of Engineers, New Orleans District, resulted in recommendations for improving submerged cultural resources investigations. The current project incorporated some of these recommendations. As a result, lane spacing for the Lower Bayou Teche project was reduced to 30 m; near shore investigations, anomaly probing, and the development of a comprehensive historic, economic, and demographic framework all were undertaken for the Lower Bayou Teche project area.

Magnetics and Interpretation

Magnetic survey of the project area was designed to identify "anomalies" within the earth's magnetic field. The survey utilized a Geometrics 806 magnetometer and a Linseis analog recorder to record the results of magnetic survey. A Loran-C receiver was used to record the locations of each discovered anomaly. Fathometric data also were collected. These data were used to augment the magnetic data by providing detailed bathymetric information. Bathymetric anomalies often are formed as a result of cultural material, e.g., pipelines and shipwrecks, since these obstructions may distort the normal hydrological formations found along the bottom of waterways. Due to changing historic hydrology and to thick deposits of sediments found throughout the project area, the

usefulness of this technique was reduced greatly. Others have used bathymetry to locate shipwrecks, pipes, and cables (Saltus 1982; Pearson and Saltus 1989).

A 21 ft aluminum boat was utilized during survey. The boat was equipped with a magnetometer, fathometer, and Loran-C positioning system. A King Model 1060 fathometer and a King LC 8002 positioning unit were used to produce a fathometric record of the project area.

Magnetic survey was conducted along five transects in the area below River Mile 3.6; three transects were placed in the area between River Miles 4.8 and 3.6. Positioning data were plotted and post plots delineating survey coverage were produced (Figures 55, 56, and 57). At the time of survey, the water level of Bayou Teche was relatively high. This allowed for greater coverage, since water depths outside the channel were extremely shallow (between .6 and 1.2 m), and there is abundant aquatic vegetation. Approximately half of the shallow areas contained areas of dense underwater vegetation. Lillypads were abundant within the downstream portions of the project area.

Additional transect runs were placed within some magnetic anomalies to verify the repeatability of the anomalies, and to eliminate spurious anomalies. Additional runs also were placed within a few anomalies to determine better their extent and nature. However, tightly spaced transects could not be placed within many of the anomalies because of the narrowness of the surveyable portion of the Teche, and the extensive amount of siltation which has occurred within Bayou Teche, outside of the channel. An estimated 60 to 70 per cent of the survey area within the Teche had a water depth of 18 in (.45 m) or less. Transects placed within the channel area were run at approximately 5 miles per hour, those within the surrounding shallow flats were run at 1 to 1.5 miles per hour.

Anomalies with 10 gamma or greater inflections and extending over an area of 15 m or greater were identified as potential shipwreck loci, since no current methodology exists for differentiating modern materials from historic cultural material (Murphy and Saltus 1990). These anomalies then were investigated (Tables 14 and 15). Investigation consisted of probing with a 3 m wooden pole, wading, probing, and visually examining anomalies found in the shallower areas. A hand held Schonstedt magnetometer also was used to test some of the shallower anomalies. The latter proved useful for locating concentrated masses of metal. Once an anomaly was identified, data regarding its intensity, characteristic (dipolar, monopolar, simple, or complex in nature), size (length and width), location and water depth were noted. Anomalies falling within 50 ft (15 m) of the outside edges of the proposed 80 ft (24 m) wide corridor were determined to be in jeopardy of impact by the proposed maintenance dredging. These data then were plotted to facilitate interpretation (Figures 58 and 59). Cross sectional profiles of the project area also were produced to assess sediment deposition, and to identify changes throughout the area (Figures 60 through 64). These cross sections were prepared based on compilation of several sets of data. The modern locations of Howell's 1870 cross sections (Figure 12) were estimated. Water depth data collected during the 1990 marine

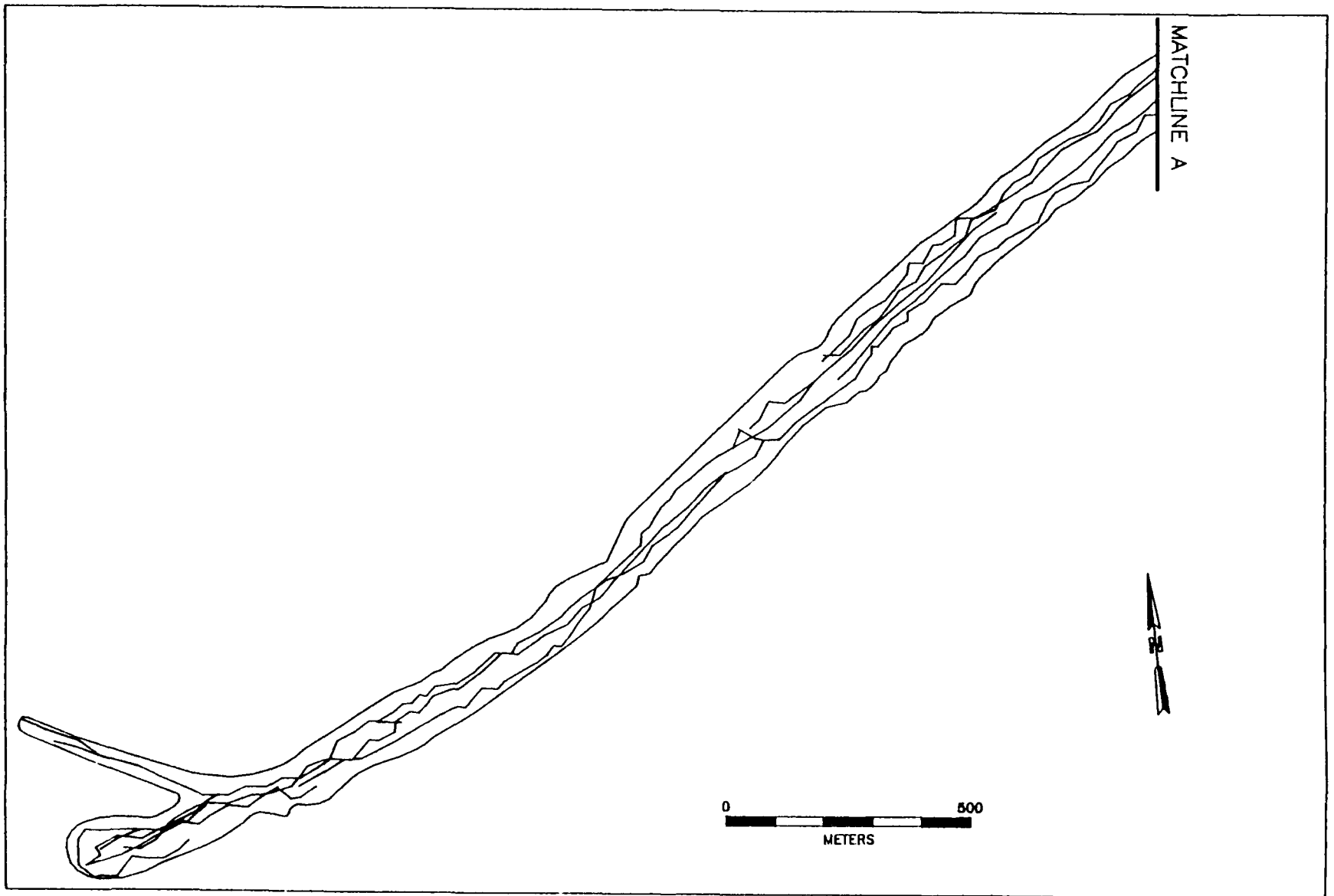


Figure 55. Post plot of the western third of the Bayou Teche riverine magnetometer survey.

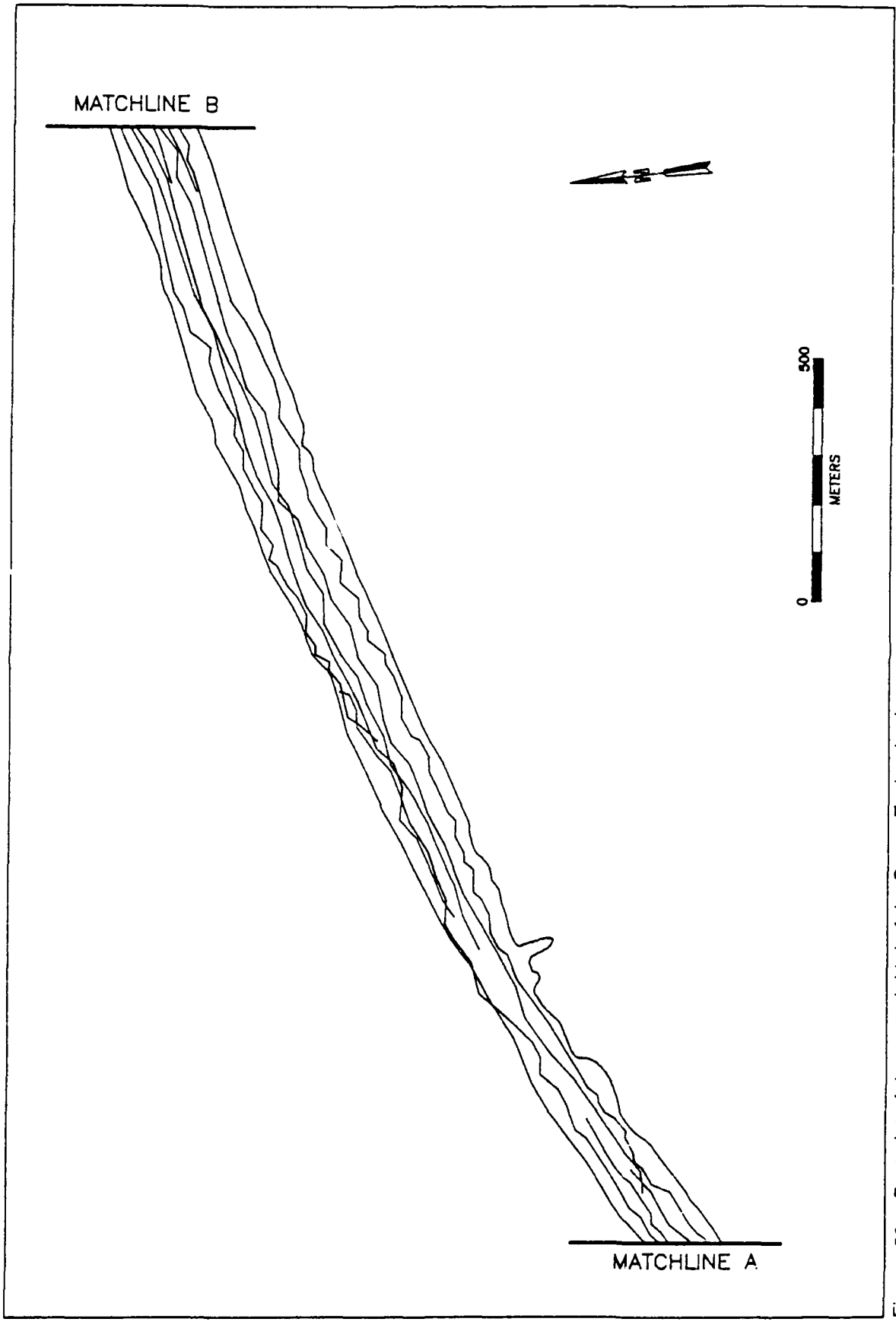


Figure 56. Post plot of the central third of the Bayou Teche riverine magnetometer survey.

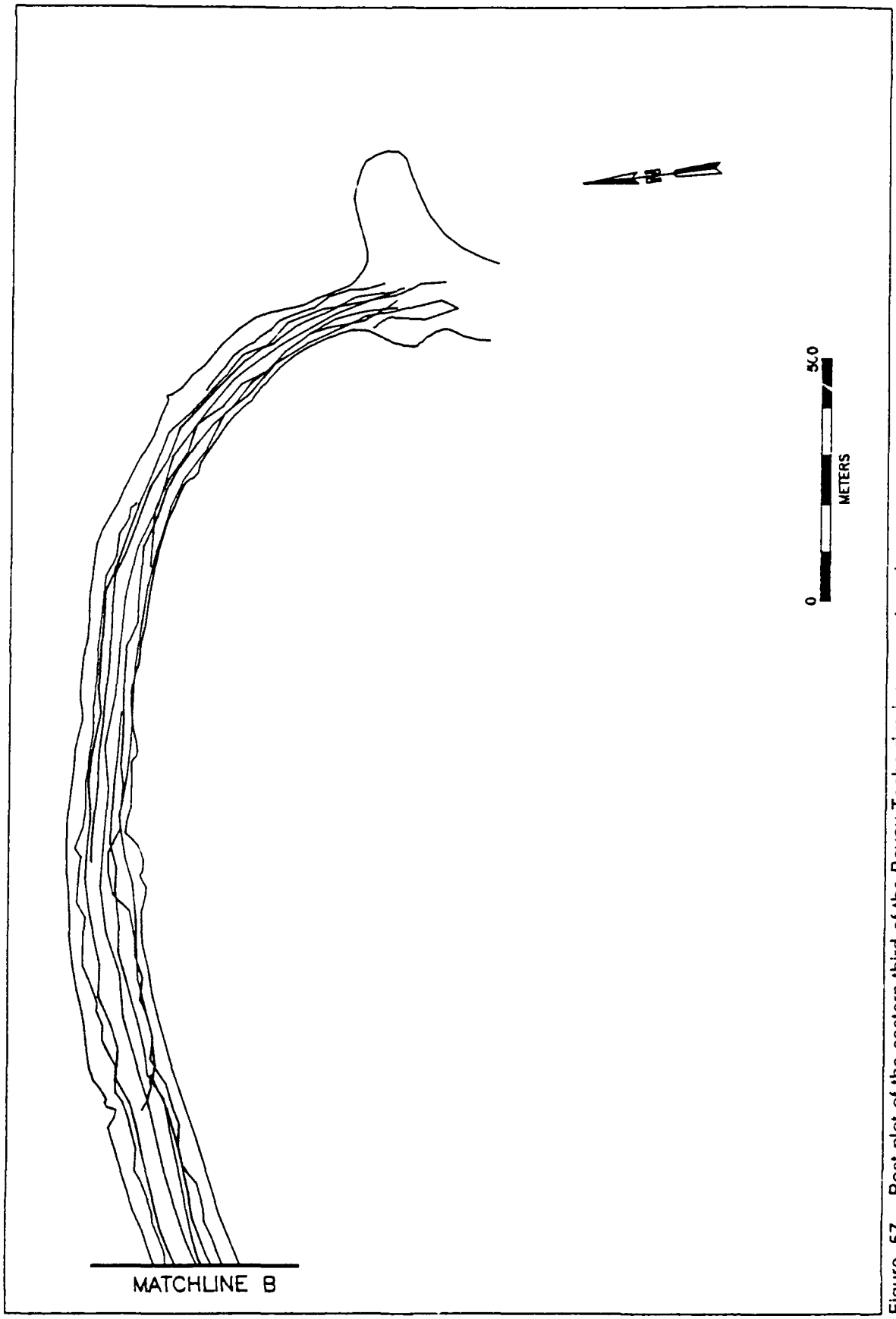


Figure 57. Post plot of the eastern third of the Bayou Teche riverine magnetometer survey.

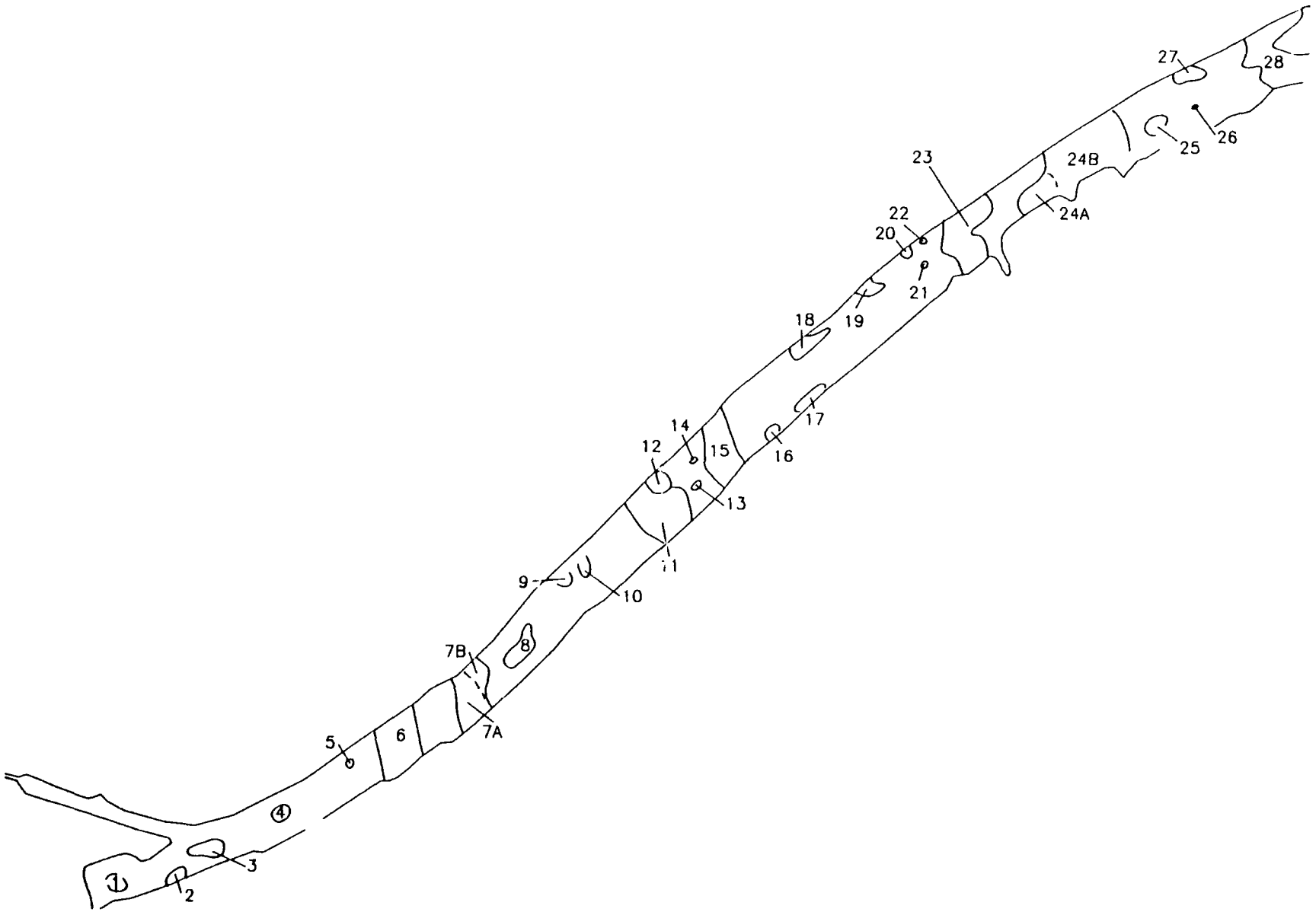


Figure 58. Riverine magnetic anomalies located in the west half of the Bayou Teche survey area.

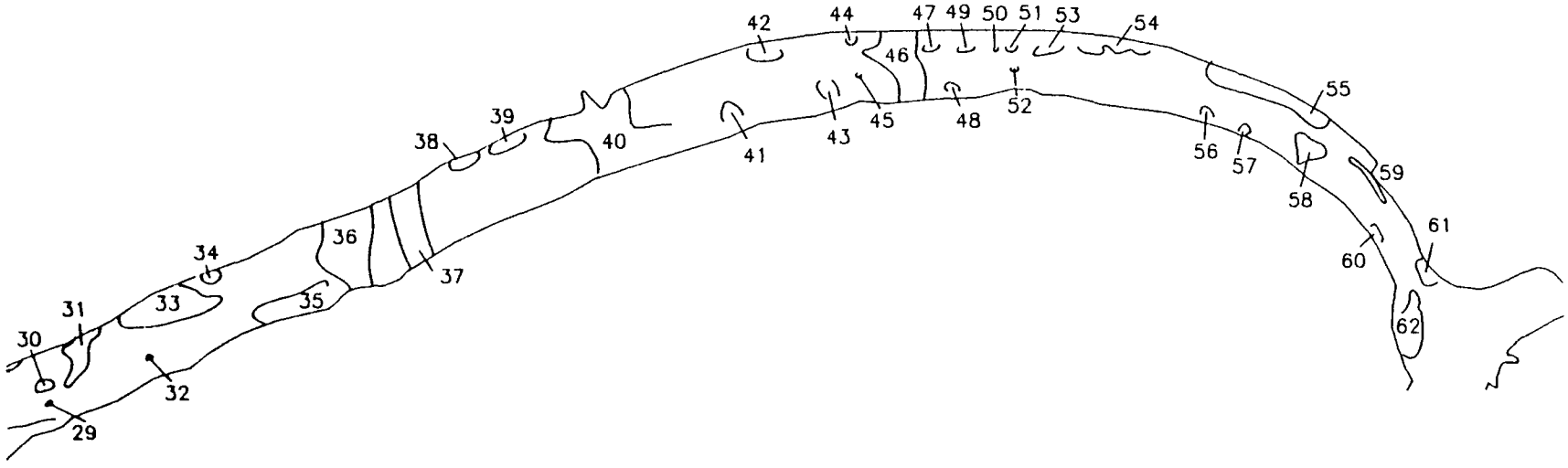


Figure 59. Riverine magnetic anomalies located in the east half of the Bayou Teche survey area.

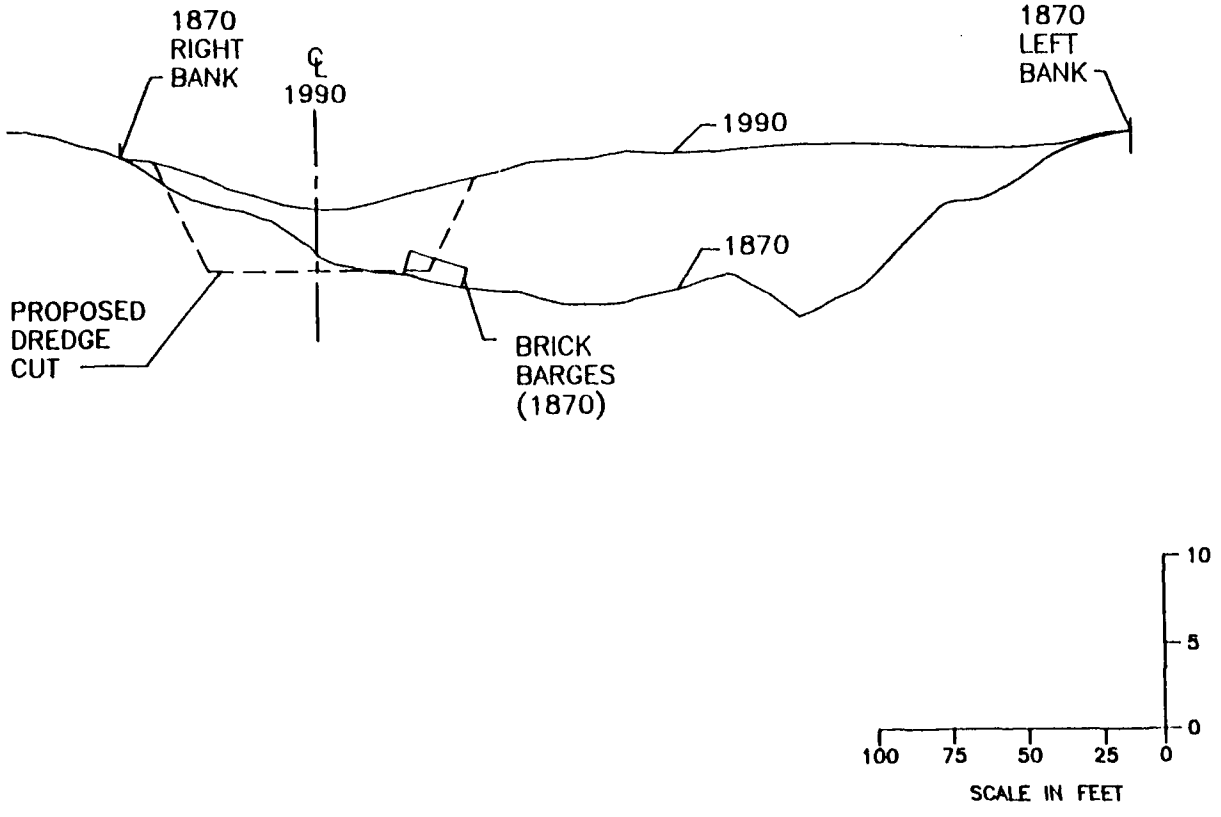


Figure 60. Comparison of Section 24 on Howell's 1870 *Survey of the Bayou Teche* with the generalized corresponding 1990 section, near Baseline Station 39 + 94.40.

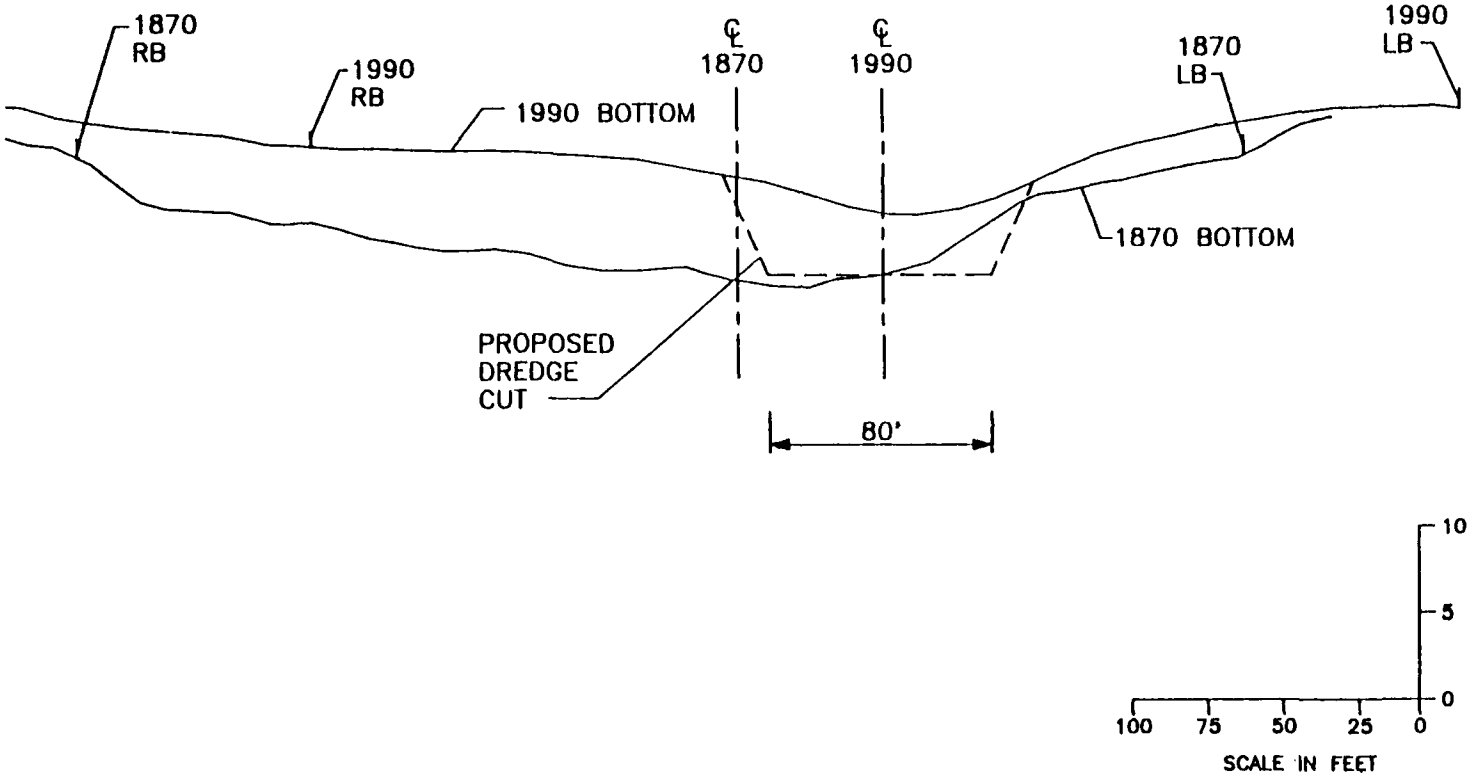


Figure 61. Comparison of Section 25 on Howell's 1870 *Survey of the Bayou Teche* with the generalized corresponding 1990 section, near Baseline Station 90 + 84.05.

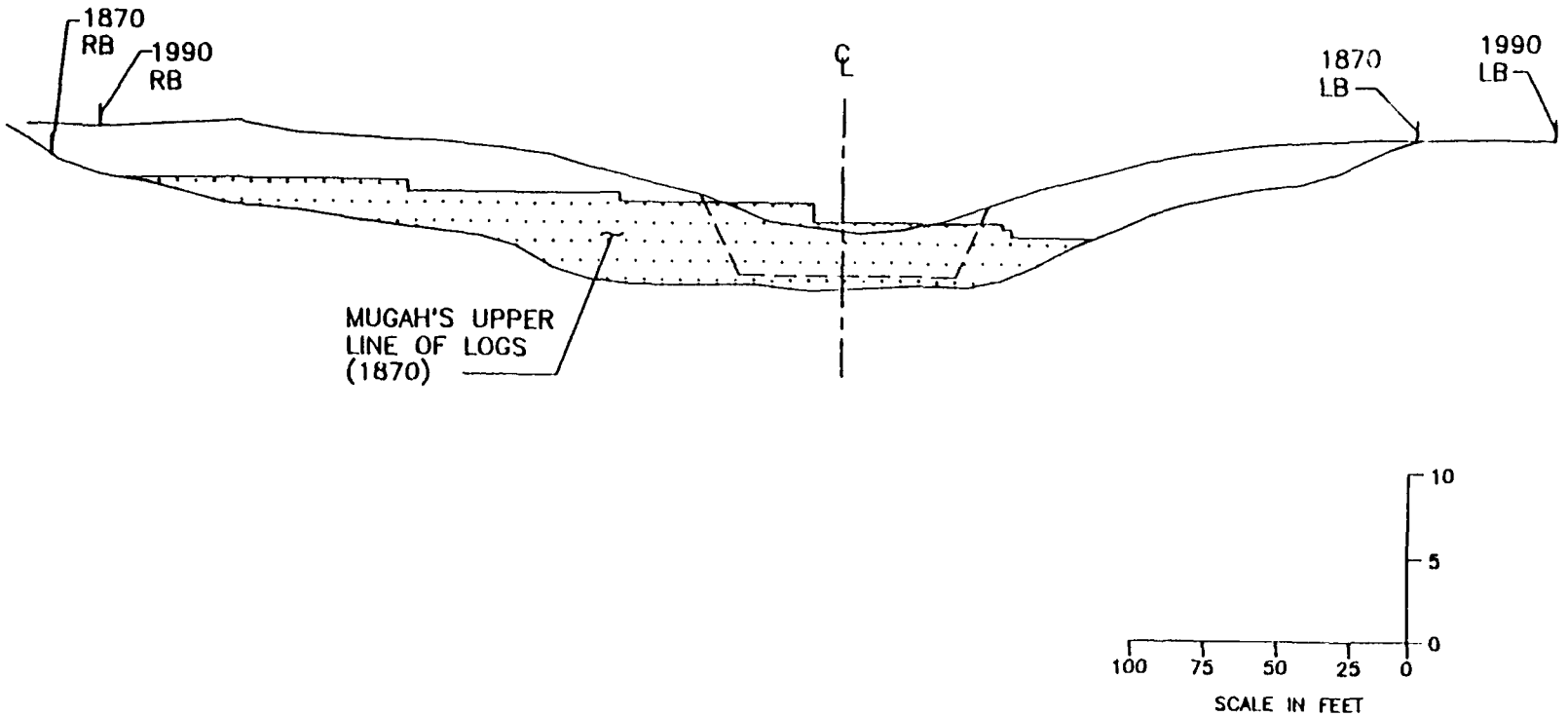


Figure 62. Comparison of Section 26 on Howell's 1870 *Survey of the Bayou Teche* with the generalized corresponding 1990 section, near Baseline Station 160+50.

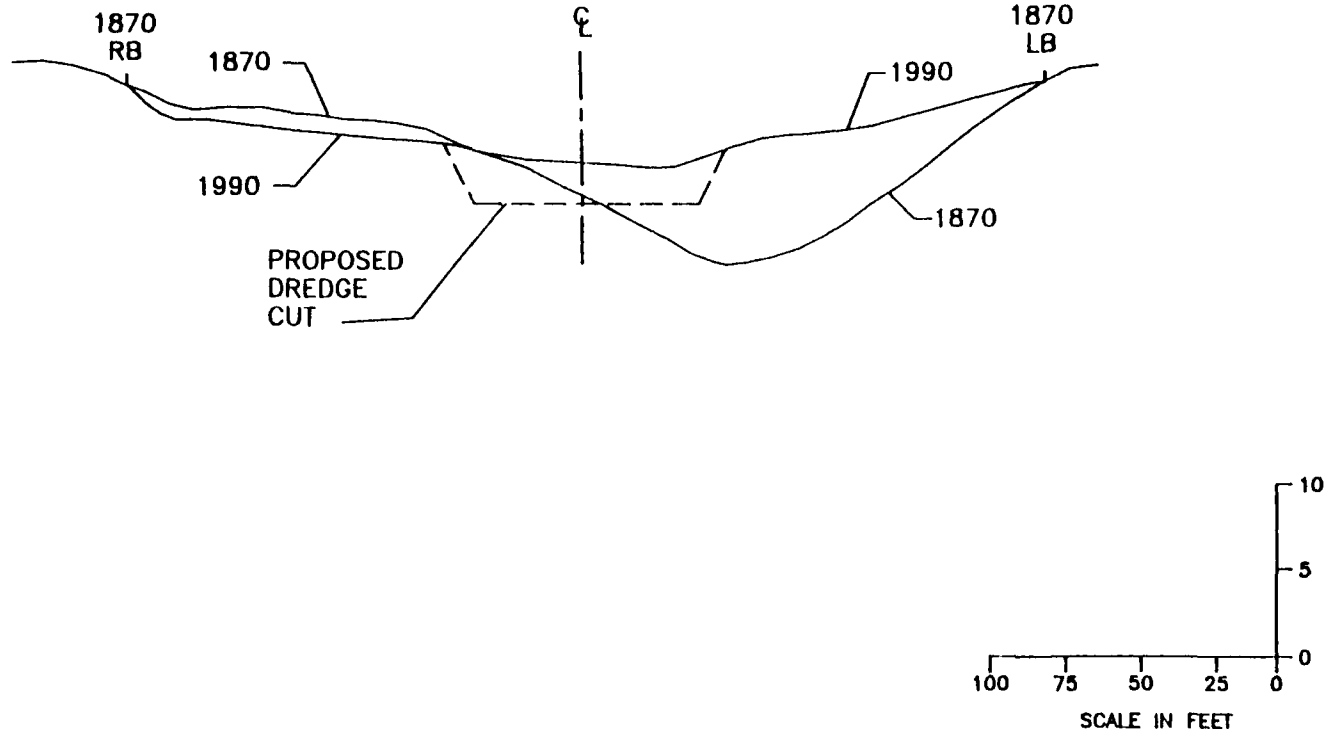


Figure 63. Comparison of Section 27 on Howell's 1870 *Survey of the Bayou Teche* with the generalized corresponding 1990 section, near Baseline Station 240 + 00.

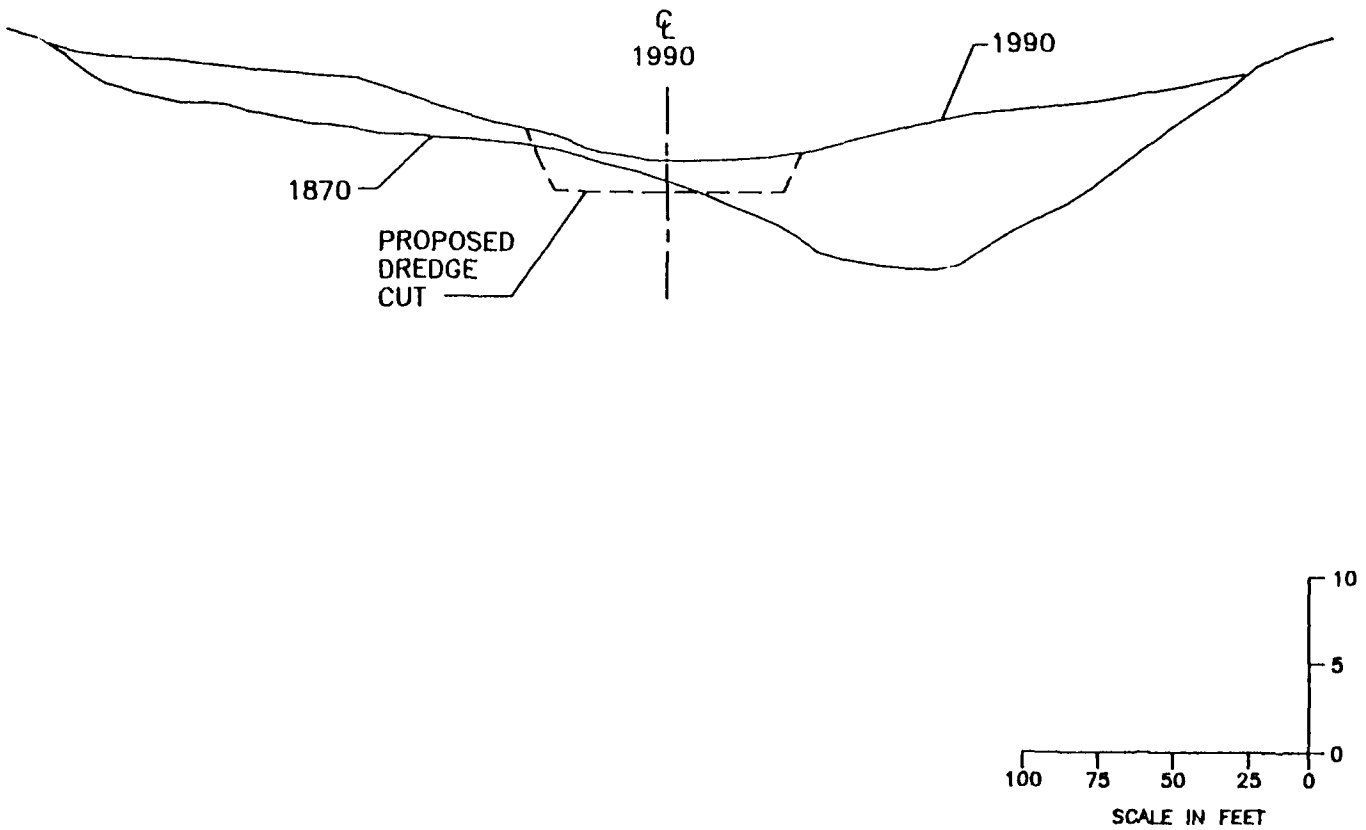


Figure 64. Comparison of Section 28 on Howell's 1870 *Survey of the Bayou Teche* with the generalized corresponding 1990 section, near Baseline Station 261 + 00

Table 14

MAGNETIC ANOMALIES LOCATED WITHIN BAYOU TECHE, UPSTREAM (EASTERN) HALF OF PROJECT AREA

Anomaly Number	Intensity (gammas)	Length (feet)	Width (feet)	Characteristics d=dipole m=monopole c=complex	Location SRM	Water Depth (feet)	Modern Association	Historic Association	Conflict With Project Design	Additional Work Recommended
1	165	200	150	d/c	4.68	3-5		*CSS J.B. Cotton, Landing*		
2	70	220	100	d/c	4.58	0-2		Bethel's bridge (1863)		
3	70	350	150	d/c	4.50	0-5		1893 bridge	Y	N
4	40	180	100	d	4.37	0-7		Calumet (16SMY67)		
5	100	60	b	d	4.25	0-2				
6	-	-	-	-	4.15	-	Pipelines		Y	N
7a	-	-	-	-	4.02	-	Pipeline		Y	N
7b	With P/L	150	100	-	3.98	-		Brick barge		
8	140	400	150	d/c	3.90	5-8		Bethel's Grand Wood Bridge (1870) *CSS Flycatcher*	Y	Y

Anomaly Number	Intensity (gammas)	Length (feet)	Width (feet)	Characteristics d = dipole m = monopole c = complex	Location SRM	Water Depth (feet)	Modern Association	Historic Association	Conflict With Project Design	Additional Work Recommended
9	20	120	b	d	3.76	0-2		1893 bridge		
10	25	100	100	d	3.74	0-2		Landing at Bethel I (16SMY68)		
11	-	-	-	-	3.58	-	Standing bridge			
12	70	250	100	d	3.54	0-3				
13	120	110	50	d	3.50	0-5		Three brick barges	Y	Y
14	25	80	-	m	3.48	0-6				
15	-	-	-	-	3.42	-	Pipeline		Y	N
16	128	160	b	m	3.33	2-6				
17	70	380	b	d/c	3.25	2-8	Sea wall			
18	200	430	100	d/c	3.20	0-3				
19	70	200	100	d	3.05	0-3		1893 bridge		
20	15	80	b	m	2.99	0-3				
21	10	60	50	m	2.98	5-7			Y	N
22	130	60	b	d	2.97	0-3				

Anomaly Number	Intensity (gammas)	Length (feet)	Width (feet)	Characteristics d=dipole m=monopole c=complex	Location SRM	Water Depth (feet)	Modern Association	Historic Association	Conflict With Project Design	Additional Work Recommended
23	1000	600	400	d/c	2.90	0-6	Bridge	Late nineteenth century to 1970 bridge(s)	Y	N
24a	75	550	150	d	2.75	2-8	Shipyard	1863 *Cornay's Bridge, Caisson, Landing*	Y	Y
24b	-	-	-	-	2.65	-	Shipyard/ Docks		Y	N
25	60	210	100	d/c	2.52	0-3	Possible shipyard/docks debris	Early twentieth century dock		
26	60	60	b	d	2.45	0-3				
27	600	300	150	d	2.44	0-4	Wooden trawler			
28	128	950	400	d/c	2.22	0-9		1893-1945 bridge, scow barge-like structure	Y	N

Table 15

MAGNETIC ANOMALIES LOCATED WITHIN BAYOU TECHE, DOWNSTREAM (WESTERN) HALF OF PROJECT AREA

Anomaly Number	Intensity (gammas)	Length (feet)	Width (feet)	Characteristics d=dipole m=monopole c=complex	Location SRM	Water Depth (feet)	Modern Association	Historic Association	Conflict With Project Design	Additional Work Recommended
29	45	60	b	d	2.18	0-2		*CSS Turtle*, CS torpedo machine, landing	Y	Y
30	70	150	50	d	2.18	2-8		*John Bowles*, landing	Y	Y
31	296	300	400	d/c	2.14	0-8		Landing	Y	Y
32	35	90	b	d	2.04	0-2				
33	165	550	150	d/c	2.00	0-8		*John Bowles*, landing	Y	Y
34	20	80	50	d	1.92	0-2				
35	150	600	b	d	1.80	0-2		*CSS Turtle*, CS Torpedo Machine, flume		

Anomaly Number	Intensity (gammas)	Length (feet)	Width (feet)	Characteristics d=dipole m=monopole c=complex	Location SRM	Water Depth (feet)	Modern Association	Historic Association	Conflict With Project Design	Additional Work Recommended
36	-	-	-	-	1.73	-	Pipeline	1893 bridge	Y	N
37	-	-	-	-	1.65	-	Pipeline	1893 bridge	Y	N
38	200	220	b	d	1.55	0-2				
39	30	300	b	d/c	1.48	0-2				
40	470	650	500	d/c	1.35	0-8		early twentieth century bridge, landing	Y	N
41	10	140	b	m	1.18	0-5	Pipeline sign			
42	35	250	b	d/c	1.11	0-2		Land feature		
43	80	70	170	d	1.05	2-5				
44	50	70	b	d	0.98	0-3				
45	20	50	50	d	0.98	0-6				
46	-	-	-	-	0.95	-	Pipeline		Y	N
47	40	120	50	d	0.89	0-3				
48	250	110	b	d	0.87	2-7	Pontoon barge			
49	100	100	b	m	0.85	0-4				

Anomaly Number	Intensity (gammas)	Length (feet)	Width (feet)	Characteristics d=dipole m=monopole c=complex	Location SRM	Water Depth (feet)	Modern Association	Historic Association	Conflict With Project Design	Additional Work Recommended
50	50	50	b	m	0.80	0-4				
51	35	70	b	m	0.79	0-4				
52	40	70	50	m	0.78	7-9	Wreckage along bank		Y	N
53	200	220	b	m	0.74	0-4				
54	85	500	70	d/c	0.65	0-3				
55	30	950	140	d/c	0.50	0-3		*Southern Lady*		
56	60	100	b	m	0.48	1-4	Boat under construc-tion			
57	40	90	b	d	0.42	1-4	Dock			
58	58	260	200	m	0.31	2-8			Y	Y
59	60	450	50	d	0.25	4-6	Trot line		Y	N
60	10	130	b	d	0.18	3-5	Trot line			
61	35	200	80	d	0.10	0-8		Landing		
62	402	500	150	d/c	0.03	5-10		*Mary F. Golden*		

survey, adjusted to sea level using bathymetric data included on Corps of Engineers project maps, were used to estimate the modern sections. Finally, locations of the proposed channel cuts were approximated based on Corps of Engineers field maps. Figures 60 through 64 provide a generalized comparison of cross sections to demonstrate the approximate amount of siltation which has occurred within the bayou since 1870.

Historic associations presented on Tables 14 and 15 were determined from a number of sources. These sources included a ca. 1863 Confederate map of St. Mary Parish (Figure 10); Trinidad's 1868 sketch of the bayou (Figure 14); Howell's 1870 survey of Bayou Teche (Figure 11); various twentieth century maps and photographs; and collected archeological data. Historic maps are not always completely reliable, however, and in some cases resulted in the association of a historic resource with two or more recorded magnetic anomalies.

Results of the Marine Survey

Anomaly No. 1 was a dipolar anomaly located at River Mile 4.68. The anomaly measured 150 x 200 ft (46 x 61 m) and possessed a magnetic inflection of 165 gammas. Bottom depth in the area of Anomaly No. 1 was 3 to 5 ft (.9 to 1.5 m). The anomaly is situated in the central area of a small pond-like remnant which was cut off from the rest of Bayou Teche by a partial plug. The plug is forming along the right descending bank opposite the canal which leads to the Wax Lake Outlet. The anomaly is situated approximately 30 to 40 m off a set of pilings that line the right bank downriver from Cross Section No. 23 near the location of the *J. B. Cotton* (Figure 11). The *Cotton* reportedly was "removed" by the U.S. Army Corps of Engineers. However, Anomaly No. 1 could represent either remnants of this vessel, or cultural material associated with the landing.

Anomaly No. 2 is a complex dipolar anomaly located at River Mile 4.58. The anomaly measured 100 x 220 ft (30 x 67 m), and produced a 70 gamma inflection. Bottom depth in the area of Anomaly No. 2 measured 2 ft (.6 m). This anomaly also is situated in the pond like cutoff described above. The position of the anomaly correlates well with the mapped location of Bethel's bridge (Figure 10).

Anomaly No. 3 is a complex dipolar anomaly located at River Mile 4.50 (Figure 65). The anomaly measured 150 x 350 ft (46 x 107 m) and possessed a magnetic inflection of 70 gammas. Bottom depth in the area of Anomaly No. 3 was 0 to 5 ft (0 to 1.5 m). This location corresponds to the mapped location of an 1893 bridge (Figure 13). Anomaly No. 3 is located above the modern Bayou Teche cut which extends to the outlet. Proposed dredging will not impact the site and no further work is recommended at this time. If dredging is extended into this area at a future date, then further work at Anomaly No. 3 will be required.

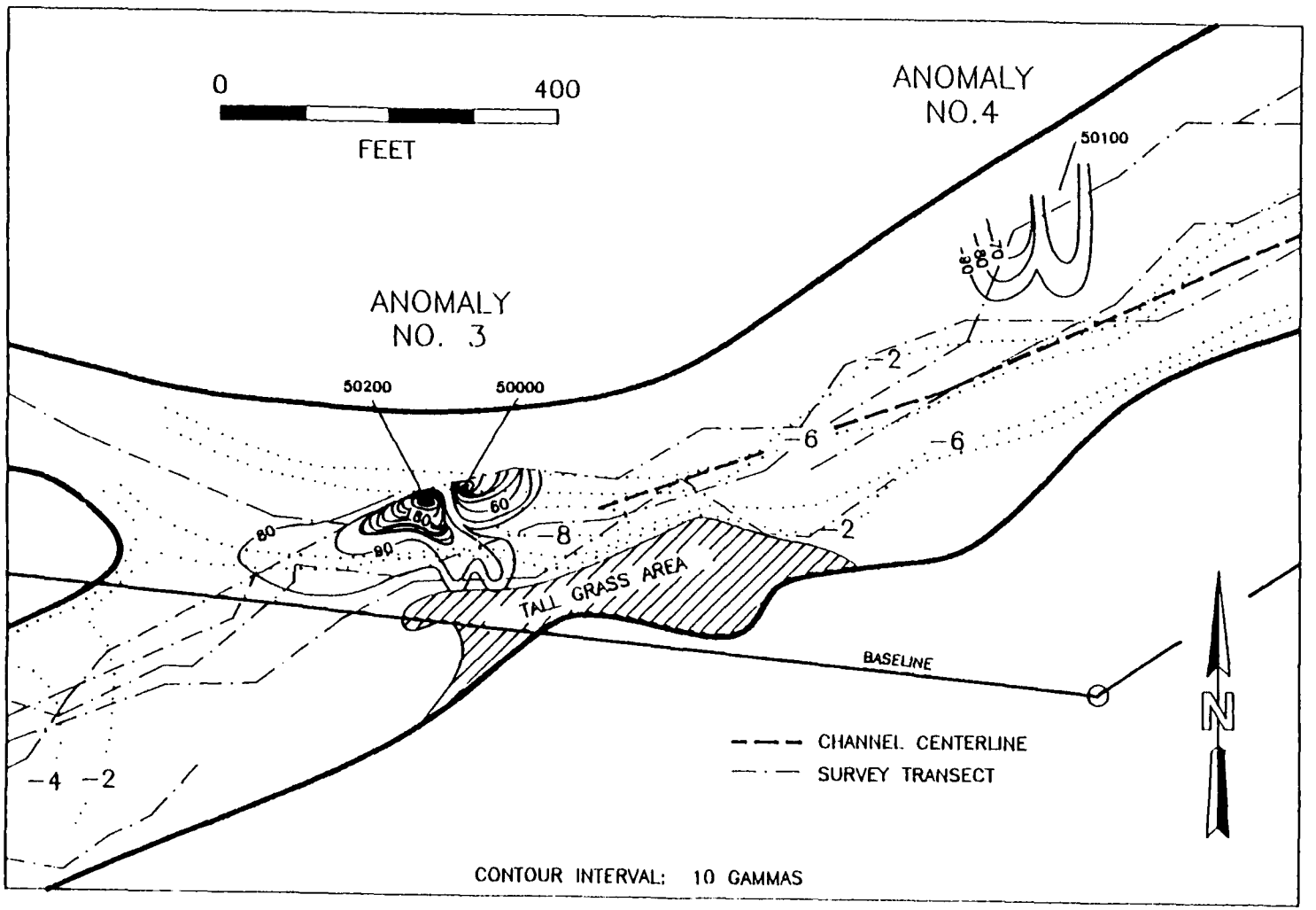


Figure 65. Map showing excerpt of survey coverage and identified sources, for Anomaly Nos. 3 and 4.

Anomaly No. 4 is a dipolar anomaly located at River Mile 4.37 (Figure 65). The anomaly measured 100 x 180 ft (30 x 55 m), and produced a 40 gamma inflection. Bottom depth in the area of Anomaly No. 4 was 0 to 4 ft (0 to 1.2 m). The anomaly lies along the left bank of Bayou Teche. It may be associated with Calumet (16SMY67), located during the current investigations. Anomaly No. 4 is located outside of the existing channel.

Anomaly No. 5 is a dipolar anomaly located at River Mile 4.25. The anomaly measured 60 ft (18 m) along the left descending bank. It had a 100 gamma inflection. Bottom depth in the area of Anomaly No. 5 was 0 to 2 ft (0 to .6 m).

Anomaly Nos. 6 and 7a (Figure 66), situated at River Miles 4.15 and 4.02 respectively, coincided with pipelines that cross Bayou Teche. Anomaly 7b measured 150 x 100 ft (46 x 30 m) along the east bank of the bayou, at River Mile 3.98. It may represent the remains of a brick barge (Figure 11).

Anomaly No. 8 is a complex dipolar anomaly located at River Mile 3.90 (Figure 66). The anomaly measured 150 x 400 ft (46 x 122 m) and had a magnetic inflection of 140 gammas. Bottom depth in the area of Anomaly No. 8 was 5 to 8 ft (1.5 to 2.4 m). Distortions in the 1870 Howell map (Figure 11) allow for two possible historic associations. This anomaly may be associated with the *CSS Flycatcher*, a Confederate gunboat sunk in the Teche to form an obstruction. This interpretation is buttressed by Corps of Engineers shipwreck data, which previously identified the Anomaly No. 8 area as containing the remains of that gunboat. This area also may by associated with Hydrological Cross Section No. 24 on Howell's map (1870). This cross section was taken at the location of "Bethel's Grand Wood" (a swing bridge). Howell noted that a brick barge was lost approximately 30 m up the bayou from Cross Section No. 24. Howell depicts the barge as lying in 8 to 10 ft (2.4 to 3 m) of water. The structure was shown to be 22 ft (7 m) wide and approximately 2 ft (.6 m) deep; this suggests a flat or cheland hull form.

Anomaly No. 8 extends into the main channel of Bayou Teche. The area may be associated with the *Flycatcher*, or the swing bridge and the brick barge. The cause of the anomaly does not appear to be associated with the remains of a sunken Chris Craft or with a steel barge that are found along the west bank (Figure 66). This anomaly will be impacted by the proposed dredging. Further work to determine if Anomaly No. 8 represents the remains of the *Flycatcher*, or the swing bridge and the brick barge is recommended.

Anomaly No. 9 is a dipolar anomaly located at River Mile 3.76. The anomaly measured 120 ft (37 m) along the left descending bank of Bayou Teche. It had a magnetic inflection of 20 gammas; the bottom depth in the area of this anomaly was from 0 to 2 ft (0 to .6 m). In 1893, a bridge spanned the bayou in the vicinity of this anomaly (Figure 13).

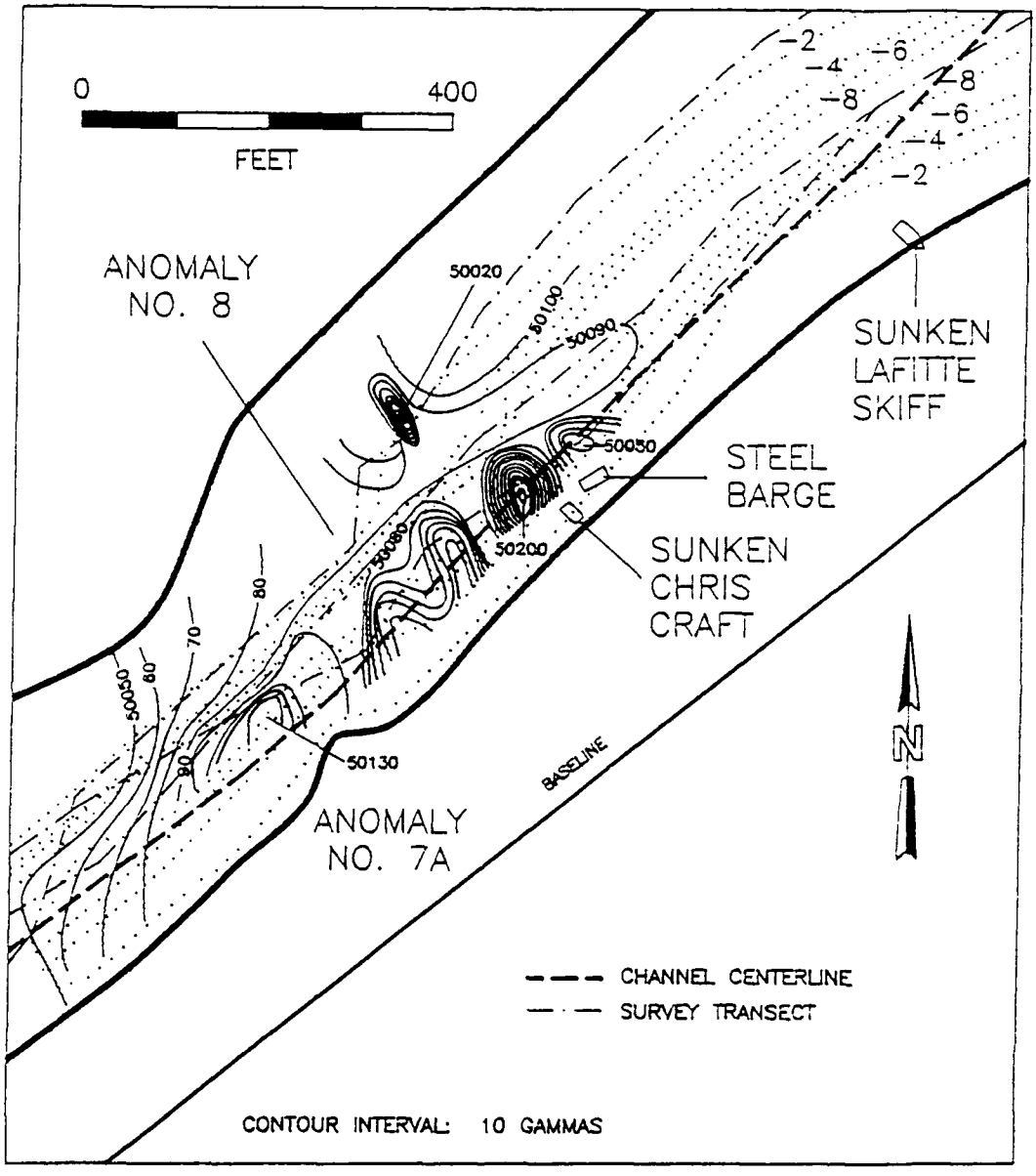


Figure 66. Map showing excerpt of survey coverage and identified sources, for Anomaly Nos. 7A and 8

Anomaly No. 10 is a dipolar anomaly located at River Mile 3.74. The anomaly measured 100 x 100 ft (30 x 30 m), and was associated with the left descending bank of Bayou Teche. Anomaly No. 10 had a 25 gamma inflection. Bottom depth in the area of this anomaly was 0 to 2 ft (0 to .6 m). It was located in an area noted by Howell as containing a dock structure, adjacent to a narrow gauge rail system found and recorded within Bethel I (16SMY68) during the terrestrial magnetic survey of lower Bayou Teche. Anomaly No. 10 probably represents the remains of an historic landing.

Anomaly No. 11 represents Rizzo Bridge, the only existing highway bridge crossing the Bayou Teche project area. It is situated at River Mile 3.58.

Anomaly No. 12 is a dipolar anomaly located at River Mile 3.54 (Figure 67). It measured 100 x 250 ft (30 x 76 m) and possessed a magnetic inflection of 70 gammas. The anomaly is located towards the left descending bank of Bayou Teche in 0 to 3 ft (0 to .9 m) of water. This anomaly may represent the remains of the steamer *CSS Flycatcher* (Figure 11). The *CSS Flycatcher* probably was removed by the Corps of Engineers (Pearson et al. 1989). Wreck removal, however, was a phrase that simply denoted that a wreck was no longer a threat or obstruction to navigation. At times, wreck removal consisted simply of pulling the vessel to an area outside of the navigation channel. Howell (1870) placed the location of the *CSS Flycatcher* in the general vicinity of Rizzo Bridge, and slightly towards the left bank of Bayou Teche (Figure 11). The wreck was lying within 6 ft (1.8 m) of water. The *CSS Flycatcher* was approximately 74 ft (23 m) long, 13.5 ft (4 m) wide, and approximately 6.3 ft (1.9 m) deep.

Anomaly No. 13 is a dipolar anomaly located at River Mile 3.50 (Figure 67). The anomaly measured 50 x 110 ft (15 x 34 m) and produced a magnetic inflection of 120 gammas. Bottom depth in the area of Anomaly No. 13 varied from 0 to 5 ft (0 to 1.5 m). This anomaly may represent either remains of three brick barges, or materials lost during the removal of the *CSS Flycatcher (Figure 11)*. The anomaly, which appears to be deeply buried, falls within the channel impact area. Because of its size, location, magnetic inflection, and possible historic association, this anomaly should be tested prior to channel dredging.

Anomaly No. 14 is a monopolar anomaly at River Mile 3.48 (Figure 67). The anomaly measured 80 ft (24 m) along the left bank of Bayou Teche. The anomaly produced a 25 gamma inflection; bottom depth in the area ranged from 0 to 6 ft (0 to 1.8 m).

Anomaly No. 15, located at River Mile 3.42, falls within an area where pipelines cross Bayou Teche. Anomaly No. 16 is a monopolar anomaly and located near River Mile 3.33. This 128 gamma anomaly measured 160 ft (49 m) long and was positioned along the right bank of Bayou Teche. Bottom depth in the area of Anomaly No. 16 ranged from 2 to 6 ft (.6 to 1.8 m).

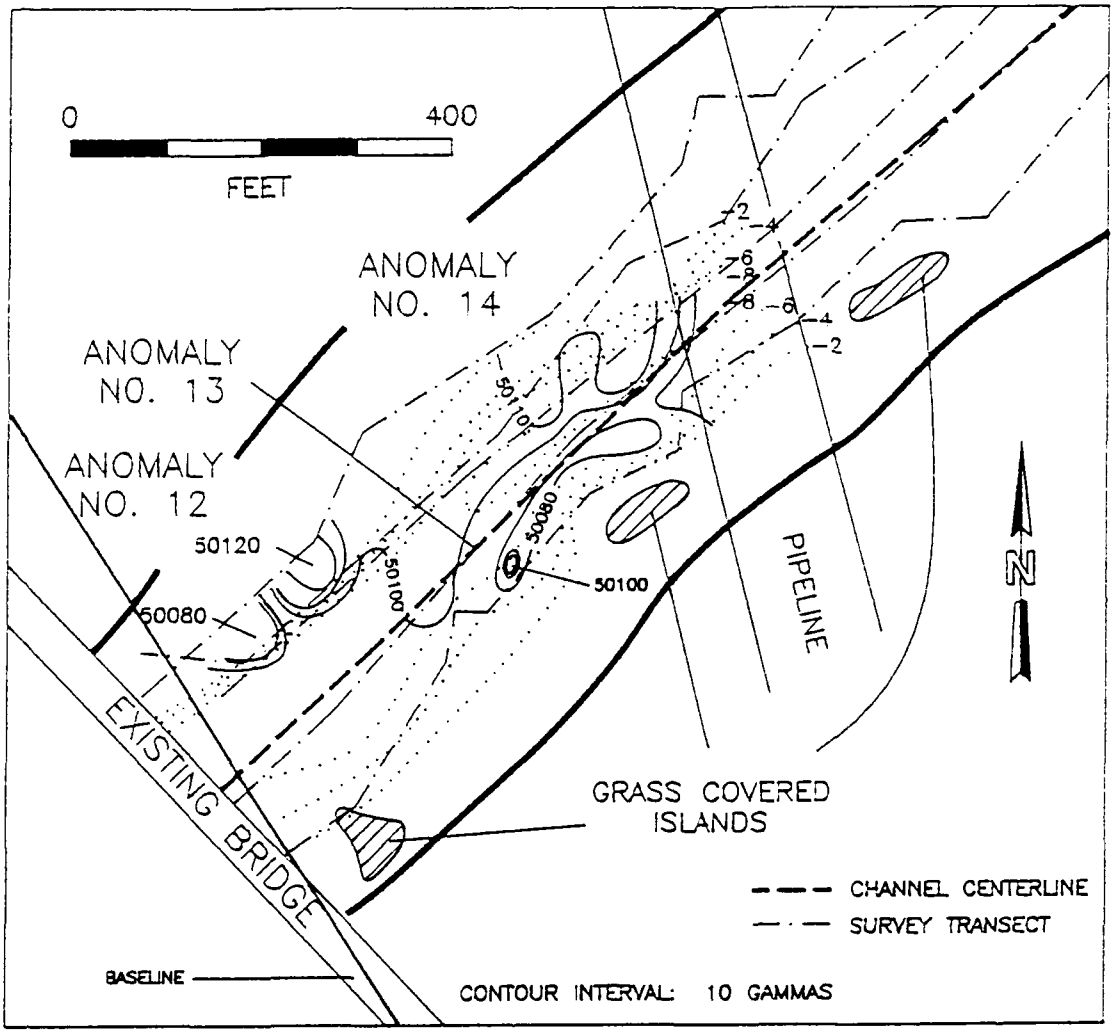


Figure 67. Map showing excerpt of survey coverage and identified sources, for Anomaly Nos. 12, 13, and 14

Anomaly No. 17 is a complex dipolar anomaly located at River Mile 3.25. The anomaly produced a 70 gamma inflection; it was situated along the right descending bank of Bayou Teche. Anomaly No. 17 measured 380 ft (116 m) long. The bottom depth in the area of the anomaly ranged from 2 to 8 ft (.6 to 2.4 m). It may reflect the ferrous materials found within the bulkhead sea wall, boat shed, and boats found along the right bank.

Anomaly No. 18 is a complex dipolar anomaly that was located near River Mile 3.20. The anomaly measured 100 x 430 ft (30 x 131 m) and produced a magnetic inflection of 200 gammas. Bottom depth in the area of this anomaly ranged from 0 to 3 ft (0 to .9 m). This anomaly may lie within an area Howell (1870) identified as containing three brick barges (Figure 11).

Anomaly No. 19 is a dipolar anomaly located at River Mile 3.05. The anomaly measured 100 by 200 ft (30 by 61 m) and produced a magnetic inflection of 70 gammas. Bottom depth in the area of this anomaly ranged from 0 to 3 ft (0 to .9 m). The location of Anomaly No. 19 coincides with the location of an 1893 bridge (Figure 13).

Anomaly No. 20 is a monopolar anomaly at River Mile 2.99. The anomaly measured 80 ft (24 m) and was positioned along the left descending bank of Bayou Teche. Bottom depth in the area of this 15 gamma inflection ranged from 0 to 3 ft (0 to .9 m).

Anomaly No. 21 is a monopolar anomaly located near River Mile 2.98 (Figure 68). The anomaly measured 50 x 60 ft (15 x 18 m) and produced a 10 gamma inflection. Bottom depth in the area of the anomaly measured 5 to 7 ft (1.5 to 2.1 m). This anomaly falls within the area that will be impacted by channel dredging.

Anomaly No. 22 is a dipolar anomaly at River Mile 2.97 (Figure 68). The anomaly measured 60 ft (18 m) along the left bank of Bayou Teche. Bottom depth in the area of Anomaly No. 22 was 0 to 3 ft (0 to 9 m). The anomaly produced a 130 gamma inflection.

Because of their close proximity, Anomalies No. 20, No. 21 and No. 22 may be related. They all are within 200 ft (61 m) of one another in an area that during historic times was positioned between two bridges.

Anomaly No. 23 is a complex dipolar anomaly at River Mile 2.90 (Figure 68). The anomaly measured 400 to 600 x 400 ft (122 to 183 x 122 m) and extended across the width of Bayou Teche. The anomaly produced an inflection of 1000 gammas. Bottom depth in the area of Anomaly No. 23 ranged from 0 to 6 ft (0 to 1.8 m). The bottom in much of this area was shallow and contained several feet of mud and organic material.

This anomaly coincides with the approximate locations of several bridges. One of the bridges depicted on the 1893 map of St. Mary Parish (Figure 13) crossed at this

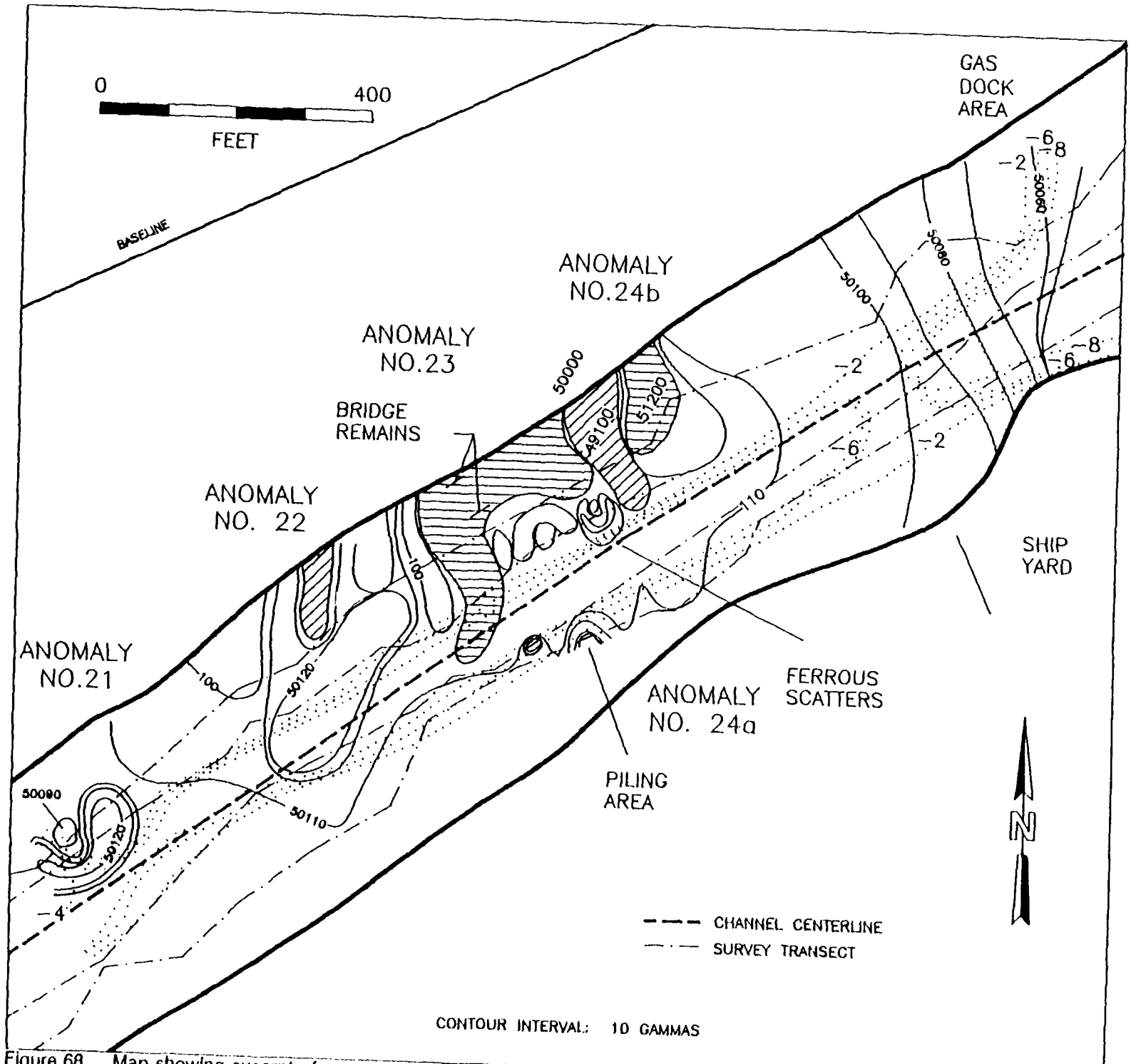


Figure 68. Map showing excerpt of survey coverage and identified sources, for Anomaly Nos. 21, 22, 23, 24a, and 24b.

location. A bridge remained at this location until the 1960s; it is depicted on the 1967 USGS 15 minute series topographic quadrangle, Belle Isle, Louisiana, as a drawbridge. Several other bridges and features were located in the immediate vicinity, probably within this anomaly or within the nearby Anomaly 24a. For example, Cornay's Bridge (Figure 10), which burned during the Civil War, was located within or adjacent to this area. During the battle, a Union caisson was lost off a pontoon bridge constructed at the location of the burned Cornay's bridge (Goodwin, Poplin et al. 1988). Howell (1870) depicts a landing, i.e., pilings, for an unnamed sugar house in the area (Figure 11). In addition, the schooner *CSS Mary Brown* was lost in the general area (Figure 14); however, Trinidad's 1868 sketch is too inaccurate to more precisely estimate the location of the schooner.

Several individuals mentioned that parts from old racing aircraft were thrown into the bayou during cleanup of the Harry P. Williams Airport. These parts belonged to aircraft that were raced by Williams and his partners. Williams was a well respected, early twentieth century racing pilot who apparently designed the planes he raced. It is possible that the non-aluminum portions of the planes contributed to this anomaly.

During survey, remnants of a bridge were observed along the left bank of Bayou Teche. These remains consisted of two sets of square pilings capped by a lentil, and two articulated sections of large squared off timbers separated by approximately 18 in. Each square section consisted of two timbers each. The timbers were held together with 3/8 in rods and 3/4 in diameter fasteners, which extended out from each section for approximately 18 in. Opposite the two bridge abutments on the other side of the bayou a single post extended out of the water.

Anomaly No. 24a is a dipolar anomaly located at River Mile 2.75 (Figure 68). The anomaly measured 150 x 550 ft (46 x 168 m), and produced an inflection of 75 gammas. Bottom depth in the area of the anomaly measured 2 to 8 ft (.6 to 2.4 m). The anomaly was located near the right descending bank of Bayou Teche, near a shipyard (right bank) and dock facility (left bank). As mentioned above, this area may contain remains associated with Cornay's Bridge, a Union caisson, and a landing. In addition, this anomaly may correspond to the location of the *CSS Alligator* (Figure 14). Howell (1870) depicted the hull of an unnamed schooner loaded with bricks in the general vicinity of this anomaly (Figure 11). Anomaly No. 24b, at River Mile 2.65, was associated with the shipyard and dock facilities.

Anomaly No. 25 is a complex dipolar anomaly located near River Mile 2.52 (Figure 69). It measured 100 x 210 ft (30 x 64 m) and produced a 60 gamma inflection. Bottom depth in the area of Anomaly No. 25 ranged from 0 to 3 ft (0 to .9 m). During survey, two rows of pilings were observed. These pilings formed a "T" at the bayou end. A pile of bricks apparently exists along the upriver side of this structure (Mike Davis, personal communication 1990). Mr. Davis also noted that additional pilings exist below the waterline.

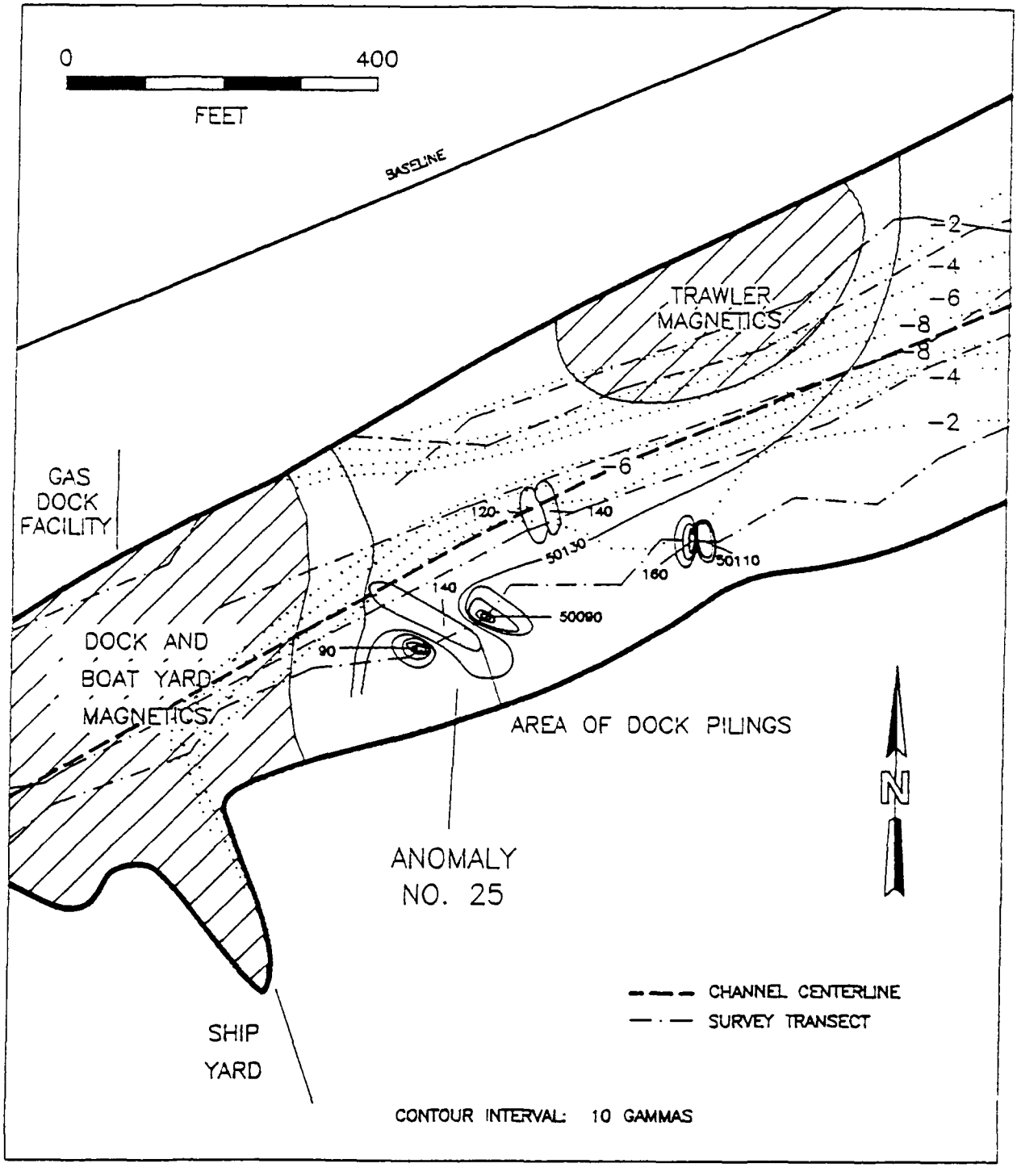


Figure 69. Map showing excerpt of survey coverage and identified sources, for Anomaly No. 25.

Anomaly No. 25 may coincide with the general location of the hull of a sunken brick schooner noted by Howell (Figure 11). The dock structure probably is associated with an early twentieth century dock located near the upstream end of Section 17, north of the Avalon Plantation big house (Figure 17). In addition, there are a variety of magnetics which may be attributed to the gas dock, the dock and boat yard, and a trawler that were identified in the area. Anomaly No. 25 falls outside of the main navigation channel. If the proposed dredging is limited to the existing channel, the proposed project will have no effect on Anomaly No. 25, and no further work is recommended.

Anomaly No. 26 is a dipolar anomaly located near River Mile 2.45. The anomaly measured 60 ft (18 m) long and produced a 60 gamma inflection. Further delineation of the width of the anomaly was not possible since it was located approximately 100 ft (30 m) from the bankline in only 18 in of water. Water depth in the area ranged from 0 to 3 ft (0 to .9 m).

Anomaly No. 27 is a dipolar anomaly located at River Mile 2.44. It measured 150 x 300 ft (46 x 91 m), and produced a magnetic inflection of over 600 gammas. Bottom depth in the area of Anomaly No. 27 measured 0 to 4 ft (0 to 1.2 m). The anomaly appears to represent the remains of a modern wooden trawler-like vessel abandoned within the bayou approximately 50 ft (15 m) from the left descending bank.

Anomaly No. 28 is a complex dipolar anomaly located between River Mile 2.18 and 2.26 (Figure 70). It is approximately 950 by 400 ft (290 by 122 m) long, and produced a maximum inflection of 128 gammas. Bottom depth in the area of Anomaly No. 28 varied from 0 to 9 ft (0 to 2.7 m). This area is located near the location of an antebellum and early twentieth century bridge (Figures 13 and 17). In addition, a sunken scow or barge-like structure was observed near the left bank in the area. Two rows of pilings also were noted. The rows were part of a series of five pilings connected by a 2 x 6 in rub rail. The watercraft was positioned against the rail. The scow measured 15 ft (4.6 m) wide and 35 ft (10.7 m) long and, was approximately 4 ft (1.2 m) deep. The ends of the vessel were raked. A 3 x 12 in board projected out in front of the rake by 1.3 ft (.4 m). One of these boards appeared to be a fastener of some type. The structure is decked with two 4 x 12 in runners placed fore to aft. The runners have an outside to outside distance of 6 ft (1.8 m) (Figure 71). This craft may represent a float or section of a historic bridge associated with Avalon Plantation (16SMY70). It lies north of the channel area.

The anomaly probably represents remains of the Avalon Plantation landing, docks, and bridge (Figure 16). A number of pilings noted along the left descending bank fall within the area noted as Anomaly No. 28. Several pilings also were observed along the right descending bank. These may be associated with landing remains along the right descending bank portion of the plantation. Anomaly No. 28 extends across the navigation channel. Based on the structure identified in association with this anomaly, it

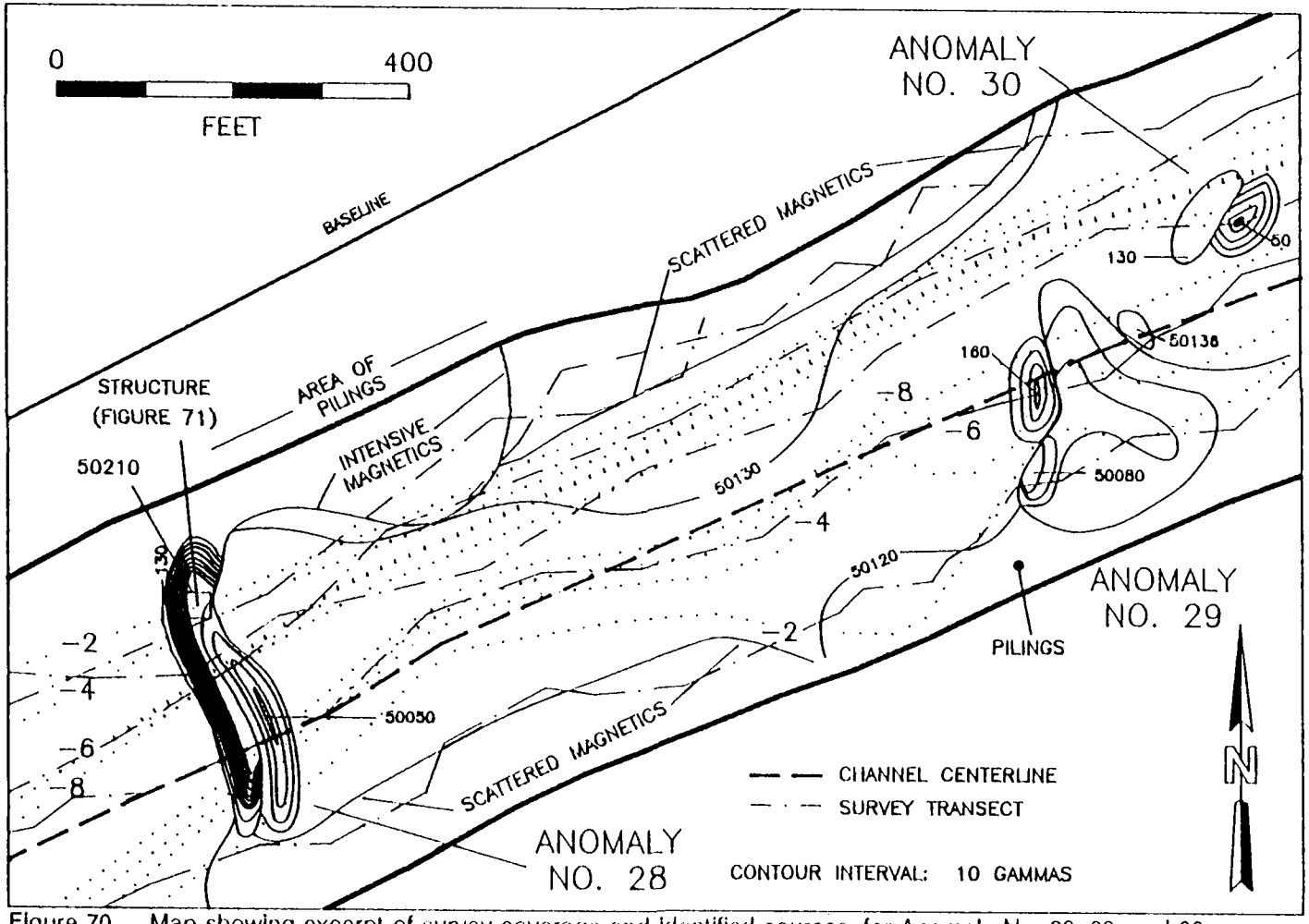


Figure 70. Map showing excerpt of survey coverage and identified sources, for Anomaly No. 28, 29, and 30.

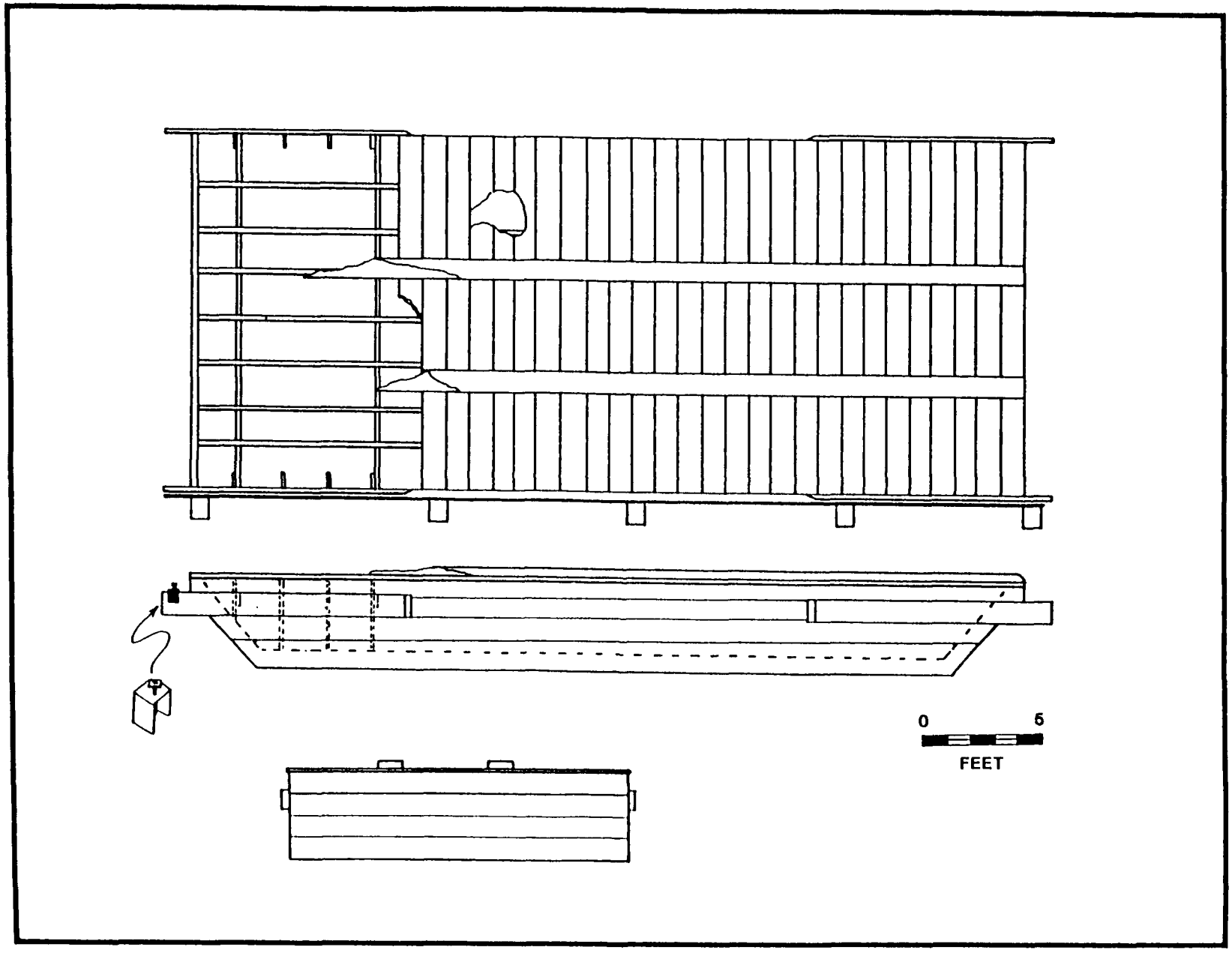


Figure 71. Scow-shaped barge-like vessel, a possible floating bridge segment, located within Anomaly No. 28, at the Avalon Plantation landing

appears that the portion of Anomaly No. 28 in the vicinity of the channel represents the remains of a late nineteenth and first half twentieth century floating pontoon bridge.

Anomaly No. 29 is a dipolar anomaly located near River Mile 2.18 (Figure 70). The anomaly measured 60 ft (18 m) long and extended for an unknown distance. Shallow water prevented the determination of anomaly width. The anomaly produced an inflection of 45 gammas. Bottom depth in the area of this feature ranged from 0 to 2 ft (0 to .6 m). This anomaly lies 150 ft (46 m) from the pilings noted on the left descending bank of Bayou Teche and associated with Anomaly No. 28. It could be associated with the muddigger *CSS Turtle* or a Confederate torpedo machine (Figures 11 and 14).

Anomaly No. 30 is a dipolar anomaly located at River Mile 2.18 (Figure 70). The anomaly measured 50 x 150 ft (15 x 46 m) and produced an inflection of 70 gammas. Bottom depth in the area of this anomaly ranged from 2 to 8 ft (.6 to 2.4 m). Additional runs placed on either side of the initial run indicated that Anomaly No. 30 lies in or under the north side slope of the existing channel. A directional magnetometer was used from the survey boat to assess the nature of the anomaly. The negative results suggested that Anomaly No. 30 probably represents an area of dispersed or deeply buried ferrous material, as opposed to a large, concentrated mass (ie., anchor, pipe, boiler, etc.). It may consist of scattered remains of the *John Bowles* (Figure 11).

Both Anomaly Nos. 29 and 30 extend into or fall within the navigation channel. In addition, areas of scattered magnetics extend throughout the immediate area. Additional work is required to assess the nature of these magnetics and to assess the effect of channel dredging on these anomalies.

Anomaly No. 31 is a complex dipolar anomaly located at River Mile 2.14 (Figure 72). It measured 400 by 300 ft (122 by 91 m), extending from the middle of Bayou Teche to the left descending bank. The anomaly measured 296 gammas. Bottom depth ranged from 0 to 8 ft (0 to 2.4 m). Pilings were located on the left bank of the project area, suggesting the location of a landing, possibly the 1870s Saunders landing. In addition, remains associated with the *John Bowles* may occur in the anomaly area (Figure 11).

Anomaly No. 32 is a dipolar anomaly located near River Mile 2.04 (Figure 72). This 35 gamma anomaly measured 90 ft (27 m) long and was encountered in shallow water approximately 100 ft (30 m) from the shoreline. Bottom depth in the area of this feature was less than 2 ft (.6 m).

Anomaly No. 33 is a complex dipolar anomaly located at River Mile 2.00 (Figure 72). The anomaly measured 150 x 550 ft (46 x 168 m) and produced an inflection of 165 gammas. Bottom depth in the area of the feature varied from 0 to 8 ft (0 to 2.4 m). This area correlates with the approximate location of Saunder's sugar house and landing (Figure 11). This is also the approximate area where the schooner *John Bowles* (Figure

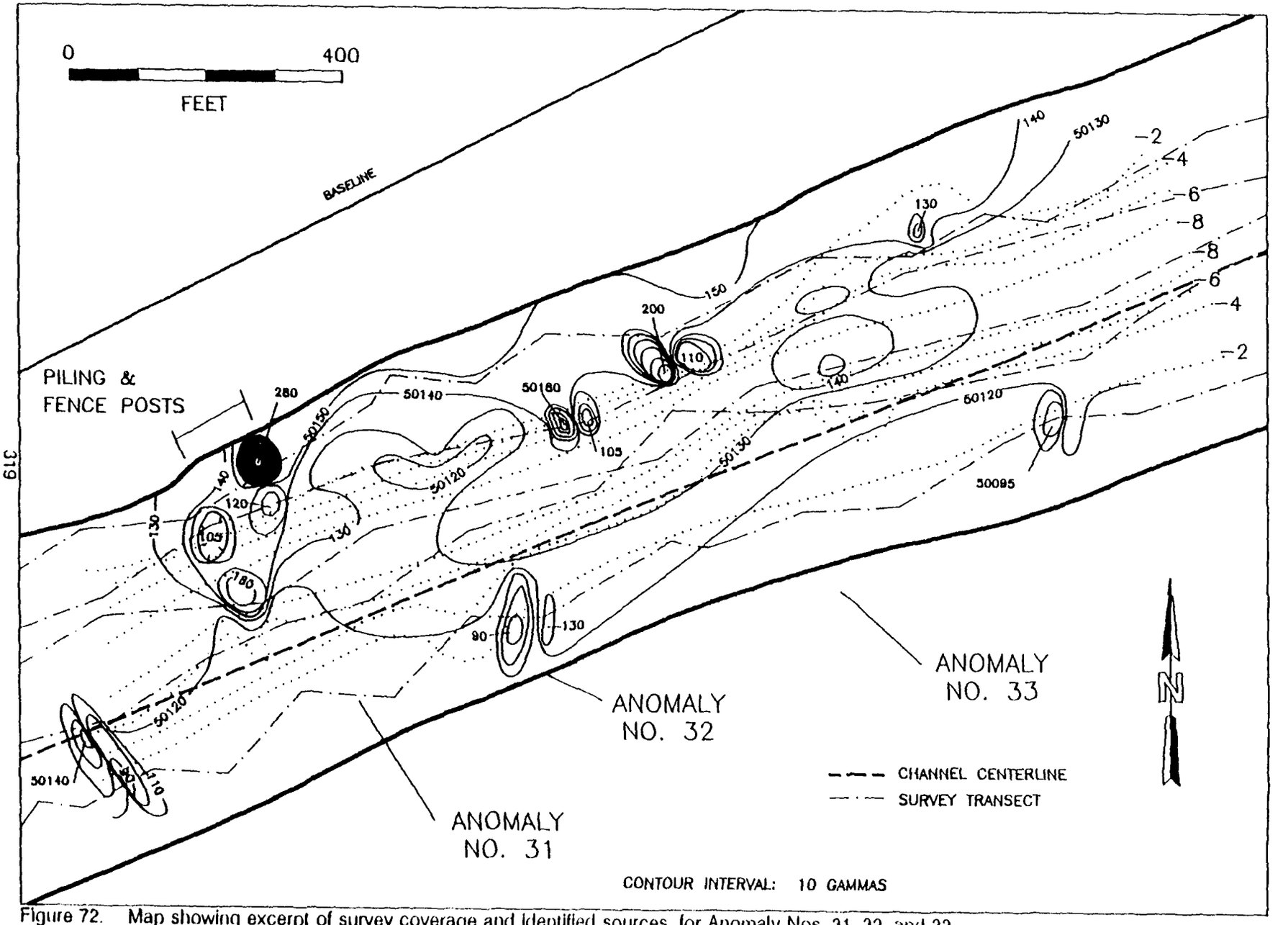


Figure 72. Map showing excerpt of survey coverage and identified sources, for Anomaly Nos. 31, 32, and 33.

11), and possibly the *CSS Mary Brown* (Figure 14) sank. The 1870 Howell map (Figure 11) depicts the wreck of the *John Bowles* in 10 ft (3 m) of water.

Anomaly No. 34 is a dipolar anomaly with a 20 gamma inflection. The anomaly measured 50 x 80 ft (15 x 24 m) and was located at River Mile 1.92. Bottom depth in the area surrounding Anomaly No. 34 ranged from 0 to 2 ft (0 to .6 m). This anomaly may be related to Anomaly No. 33.

Anomaly No. 35 is a dipolar anomaly located at River Mile 1.80. It measured 600 ft (183 m) long and was encountered within shallow water approximately 150 ft (46 m) from the right bank. Bottom depth near Anomaly No. 35 varied from 0 to 2 ft (0 to .6 m)

The area is associated with several historic "events." In 1966, a pump station and wooden flume were located on the banks of Bayou Teche on the border between irregular Sections 44 and 45. Howell (1870) depicts a muddigger and an "older one" in this general area (Figure 11). Captain Trinidad identified both watercraft: the muddigger *CSS Turtle*, and an unnamed Confederate "torpedo machine" (Figure 14). Both wrecks were reported lost off "Jonans sugar house" (Figure 11). Probing within this area revealed structure under 1 ft (.3 m) of mud and 3 ft (.9 m) of water. A handheld magnetometer suggests that the feature represents a small, dispersed concentration of ferrous materials. Since Anomaly 35 will not be affected by the planned dredging of the Teche, no additional testing is recommended.

Anomaly No. 36 and No. 37, situated at River Miles 1.73 and 1.65, are locations where pipelines and an overhead powerline cross Bayou Teche. In 1870, a wooden line of obstructions extended two-thirds of the way across the bayou in this approximate area. The area also is marked as "Muggahs' upper lines," a property boundary (Figure 11). In addition, a late nineteenth century bridge crossed the Teche in this area (Figure 13).

Anomaly No. 38 is a dipolar anomaly located near River Mile 1.55. It produced an inflection of 200 gammas. The anomaly measured 220 ft (67 m) long and was situated along the left bank of Bayou Teche. Bottom depth in the area of this anomaly varied from 0 to 2 ft (0 to .6 m).

Anomaly No. 39 is a complex dipolar anomaly with a 30 gamma inflection. It was located at River Mile 1.48 and measured 300 ft long. Anomaly No. 39 was situated along the left bank in water ranging from 0 to 2 ft (0 to .6 m). Pilings were noted in association with this anomaly. The area may be related to Luckland Plantation; it is approximately 700 ft upstream from the plantation sugar house.

Anomaly No. 40 is a complex dipolar anomaly located at River Mile 1.35 (Figure 73). The anomaly measured 650 ft (198 m) long and extended across the width of the bayou. Bottom depth in the area of this anomaly varied from 0 to 8 ft (0 to 2.4 m). The anomaly produced an inflection of 470 gammas. This area is associated with the

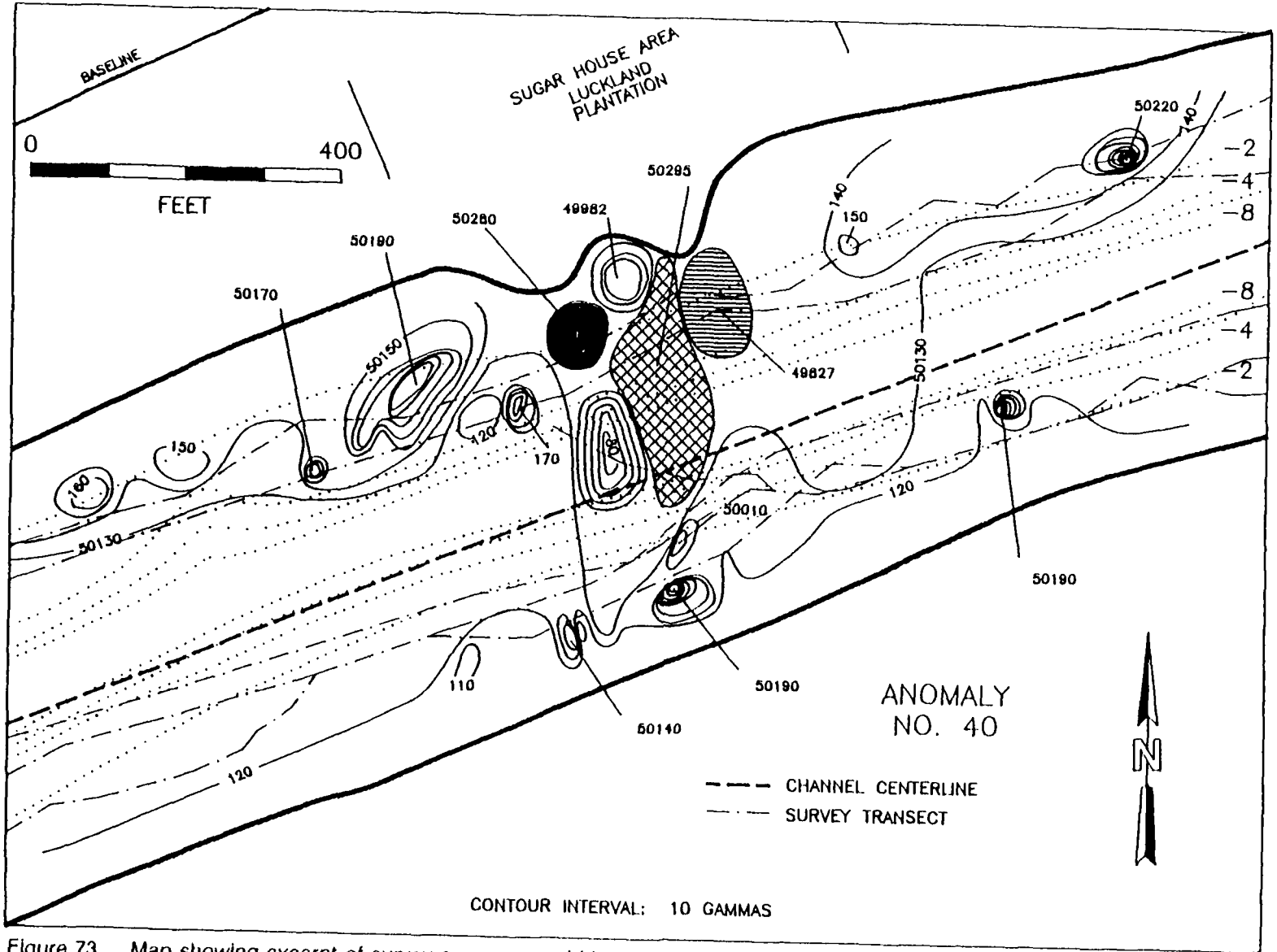


Figure 73. Map showing excerpt of survey coverage and identified sources, for Anomaly No. 40.

Luckland Plantation sugar house. The bank in this area was altered substantially during the late nineteenth or early twentieth century. A peninsula, extending approximately 90 ft (27 m) into the waterway, was noted; it probably served at the east bank terminus for the plantations's bridge across the Teche. An attempt was made to check the nearshore end of this feature however, a soft muddy bottom prevented a walkover of the feature and surrounding area.

Anomaly No. 40, which extends across the main channel, probably represents the remains of Luckland Plantation's landing and floating bridge. The magnetics found in association with this anomaly are much higher than those found in association with Anomaly No. 28, at Avalon Plantation. The remains of a boat also may be situated along the left descending bank. Most of the magnetics are concentrated along the left bank of the bayou.

Anomaly No. 41 is a monopolar anomaly located at River Mile 1.18. The anomaly measured 140 ft (43 m) along the right bank. Bottom depth in the area of this 10 gamma anomaly ranged from 0 to 5 ft (0 to 1.5 m). A pipeline crossing sign was observed near this area, however, insufficient magnetics were recorded to support this claim.

Anomaly No. 42 is a complex dipolar anomaly located near River Mile 1.11. The anomaly measured 250 ft (76 m) long and was positioned along the left bank of Bayou Teche. It produced an inflection of 35 gammas; bottom depth in the area varied from 0 to 2 ft (0 to .6 m). This anomaly was located adjacent to the Zenor site (16SMY72), directly in front of Feature 1 within Brick Scatter A. Feature 1 may represent the remains of a pumphouse; if so, Anomaly No. 42 may represent the intake for that feature.

Anomaly No. 43 is a dipolar anomaly located at River Mile 1.05. The anomaly measured 70 x 170 ft (21 x 52 m) and produced an inflection of 80 gammas. Bottom depth in the area of Anomaly No. 43 ranged from 2 to 5 ft (.6 to 1.5 m).

Anomaly No. 44 is a dipolar anomaly located at River Mile 0.98. The anomaly measured 70 ft (21 m) along the left descending bank of Bayou Teche. The anomaly produced an inflection of approximately 50 gammas. Bottom depth in the area of Anomaly No. 44 varied from 0 to 3 ft (0 to .9 m).

Anomaly No. 45 is a dipolar anomaly located near River Mile 0.98. It produced an inflection of 20 gammas and measured 50 x 50 ft (15 x 15 m). Bottom depth in the area of this anomaly varied from 0 to 6 ft (0 to 1.8 m). Anomaly No. 46, at River Mile 0.95, represents a pipeline crossing.

Anomaly No. 47 is a dipolar anomaly located at River Mile 0.89. The anomaly measured 120 ft (37 m) long and was positioned along the left descending bank of Bayou Teche; it produced an inflection of 40 gammas. Bottom depth in the area of the anomaly ranged from 0 to 3 ft (0 to .9 m).

Anomaly No. 48 is a dipolar anomaly located at River Mile 0.87. It measured 110 ft (34 m) long and was associated with a pontoon barge situated along the left descending bank of Bayou Teche. The anomaly produced an inflection of 250 gammas; bottom depth varied from 2 to 7 ft (.6 to 2.1 m).

Anomaly No. 49 is a monopolar anomaly located at River Mile 0.85. The anomaly measured 100 ft (30 m) along the left descending bank of Bayou Teche. The anomaly produced an inflection of 100 gammas. Bottom depth in the area of Anomaly No. 49 ranged from 0 to 4 ft (0 to 1.2 m).

Anomaly No. 50 was a monopolar anomaly located near River Mile 0.80. The anomaly produced a magnetic inflection of 50 gammas and measured 50 ft (15 m) long. The anomaly was positioned along the left descending bank of Bayou Teche. Bottom depth in the area of this anomaly varied from 0 to 4 ft (0 to 1.2 m).

Anomaly No. 51 was a monopolar anomaly situated near River Mile 0.79. The anomaly measured 70 ft (21 m) long and was positioned along the left descending bank of Bayou Teche. The anomaly produced an inflection of 35 gammas; bottom depth ranged from 0 to 4 ft (0 to 1.2 m).

Anomaly No. 52 was a monopolar anomaly located near River Mile 0.78. The anomaly produced a magnetic inflection of 40 gammas, and measured 50 x 70 ft (15 x 21 m). Bottom depth in the area of this magnetic feature varied from 7 to 9 ft (2.1 to 2.7 m). The left descending bank is littered with modern refuse, including a Lafitte skiff and a shrimp boat. No further work within this area of modern debris is recommended.

Anomaly No. 53 is a monopolar anomaly located near River Mile 0.74. It measured 220 ft (67 m) along the left descending bank of Bayou Teche. This anomaly produced an inflection of 200 gammas. Bottom depth in the area of this magnetic feature ranged from 0 to 4 ft (0 to 1.2 m).

Anomaly No. 54 is located near River Mile 0.65. The complex monopolar anomaly produced a magnetic inflection of 85 gammas. The anomaly measured 500 ft (152 m) long and was found along the left descending bank of Bayou Teche. Bottom depth in the area of Anomaly No. 54 varied from 0 to 3 ft (0 to .9 m).

Anomaly No. 55 is a complex dipolar anomaly located at River Mile 0.50. The anomaly measured 140 x 950 ft (43 x 290 m) and was positioned along the left descending bank. The anomaly produced a magnetic inflection of 30 gammas. Bottom depth in the area of Anomaly No. 55 varied from 0 to 3 ft (0 to .9 m).

Probing in the area of Anomaly No. 55 produced evidence of structure within a 65 to 75 ft (20 to 23 m) long area covered by a few feet of water and light mud. There appeared to be structural members extending upwards for some 8 to 10 in. It may

represent a landing associated with Moro Plantation. The paddleboat *Southern Lady* also may be located in the area. Since the anomaly will not be affected by planned dredging of Bayou Teche, no additional testing is recommended.

Anomaly No. 56 is a monopolar anomaly located at River Mile 0.48. The anomaly measured 100 ft (30 m) long and was positioned along the right descending bank of Bayou Teche. Anomaly No. 56 produced an inflection of 60 gammas; bottom depth in the area of this anomaly ranged from 1 to 4 ft (.3 to 1.2 m). The anomaly was caused by a large ferrous boat which is under construction on the right bank; its internal structure is fabricated and the boat is waiting for its hull plate.

Anomaly No. 57 is a dipolar anomaly located at River Mile 0.42. This anomaly measured 90 ft (27 m) along the right descending bank of Bayou Teche. It produced an inflection of approximately 40 gammas. Bottom depth in the area of Anomaly No. 57 varied from 1 to 4 ft (.3 to 1.2 m). A modern dock structure is located along the bank in this area.

Anomaly No. 58 is a monopolar anomaly located near River Mile 0.31 (Figure 74). The anomaly produced an inflection of 58 gammas, and measured 200 x 260 ft (61 x 79 m). Bottom depth in the area of this feature ranged from 2 to 8 ft (.6 to 2.4 m).

This anomaly falls within the proposed area of impact. The signature of this anomaly appears to be similar to one identified within the Roanoke River. In the case of the Roanoke signature, the magnetics appeared to be related to the remains of cannons, cannon carriages, and ordinances, i.e., quantities of large ferrous objects (Allen R. Saltus, Jr., personal files). Further work to identify the nature of this anomaly is recommended.

Anomaly No. 59 is a dipolar anomaly located near River Mile 0.25. The anomaly produced an inflection of 60 gammas and measured 50 x 450 ft (15 x 137 m). Bottom depth in the area of this feature ranged from 4 to 6 ft (1.2 to 1.8 m). This anomaly may result from a trot line located within the immediate vicinity.

Anomaly No. 60 is a dipolar anomaly located near River Mile 0.18. The anomaly measured 130 ft (40 m) long and was positioned along the right descending bank of Bayou Teche. The anomaly produced an inflection of 10 gammas in 3 to 5 ft (.9 to 1.5 m) of water. This anomaly also may be caused by a trot line located within the immediate area.

Anomaly No. 61 is a dipolar anomaly located near River Mile 0.10 (Figure 75). It measured 200 ft (61 m) long and was positioned along the left descending bank of Bayou Teche. It produced an inflection of 35 gammas, and apparently extended out into the bayou approximately 80 ft (24 m). Bottom depth in the area of this anomaly varied from 0 to 8 ft (0 to 2.4 m). The area is located directly in front of 16SMY10, a prehistoric site containing mounds. Richard Lynch's antebellum sugar house also was located in this

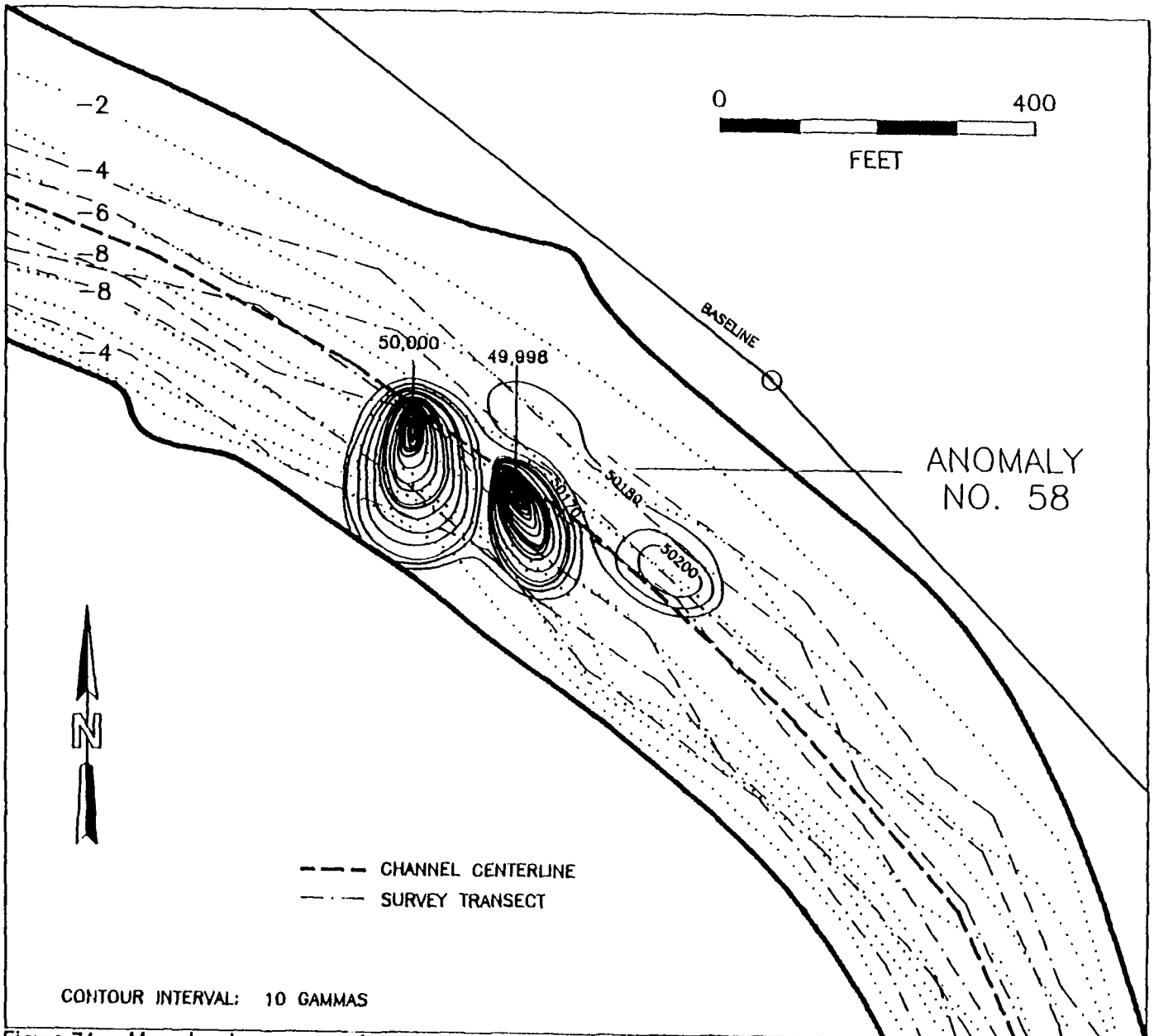


Figure 74. Map showing excerpt of survey coverage and identified sources, for Anomaly No. 58.

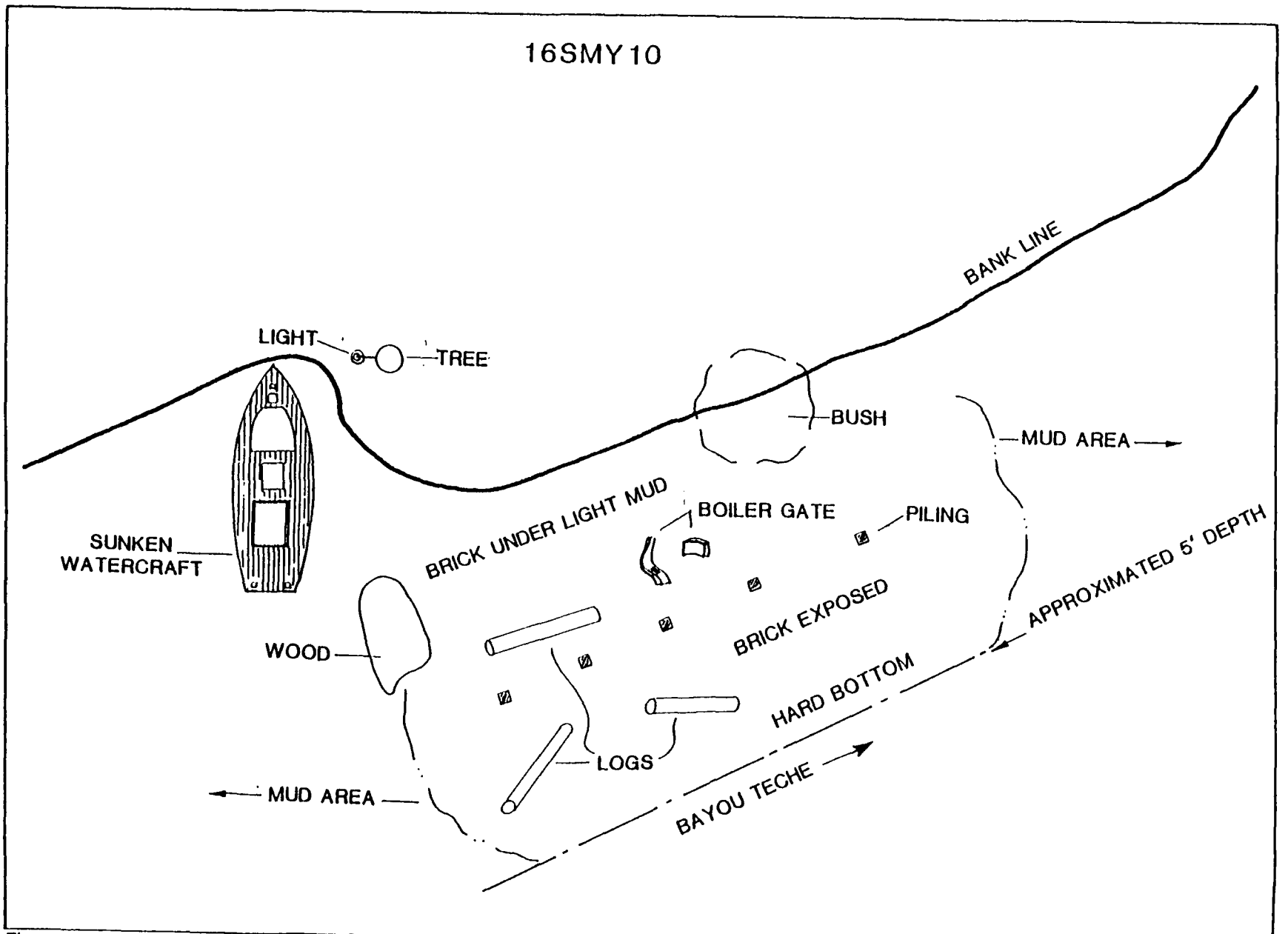


Figure 75. Observed landing remains within Anomaly No. 61, in Bayou Teche adjacent to 16SMY10.

area (Figure 11). A modern 35 to 40 ft (11 to 12 m) watercraft was noted at the upper end of this anomaly.

Approximately 30 ft (9 m) downriver from this watercraft, the bayou changes from a soft, muddy bottom to a hard, compact bottom. This area was noted and then investigated. Upon investigation, a series of bricks, pilings, cut logs, and iron materials were located. This structure appears to be a landing. Bricks recovered near the structure include large crudely made bricks, standard hand-made bricks, and slug plate fire bricks. A boiler grate also was located in the area. Because the area will not be impacted by planned dredging of the Teche, no additional testing of the landing area is recommended.

Anomaly No. 62 is a complex dipolar anomaly located near River Mile 0.03. The anomaly produced an inflection of 402 gammas and measured 150 x 500 ft (46 x 152 m). Bottom depth in the area of this anomaly varied from 5 to 10 ft (1.5 to 3 m). This apparently represents the remains of the *Mary F. Golden*, which sank in this area in 1908. She apparently was lost to fire after her kitchen stove ignited. It will not be impacted by planned dredging of Bayou Teche.

CHAPTER X

SUMMARY AND RECOMMENDATIONS

Archeological Expectations

Prior to survey, a research design was developed predicting the locations of terrestrial and marine cultural resources (Chapter VI). These expectations were used to enhance the effectiveness of the fieldwork and to aid in the interpretation of identified cultural resources. Table 16 compares archeological expectations with the results of the fieldwork. Most of the anticipated terrestrial resources were identified, and a majority of the locations of expected riverine resources either were confirmed, or were found to be associated with magnetic anomalies. Exceptions include two early twentieth century cemeteries; ephemeral remains such as the Union staging area; buildings with imprecise locational data; and destroyed sites, such as Confederate Redoubt No. 2, and probably the *J.A. Cotton*. A few resources, such as the antebellum houses of T. Wilcoxon and Mrs. Meade, probably were masked by postbellum and twentieth century occupation of the same general areas.

Terrestrial Archeological Resources

Summary

During field survey, seven archeological sites were identified within the terrestrial survey area, and additional data were collected on an eighth site, the Bisland Battlefield (16SMY166). T. e seven sites were Moro Plantation (16SMY73), Zenor (16SMY72), Luckland Plantation (16SMY71), Avalon Plantation (16SMY70), Bethel II (16SMY69), Bethel I (16SMY68), and Calumet (16SMY67). Additional testing was conducted at Zenor, Bethel II, Bethel I, and along the Wax Lake Outlet. Each of the sites is summarized and evaluated below.

Moro Plantation (16SMY73) represents the remains of a postbellum and early twentieth century plantation. In addition, the remains of Thomas Wilcoxon's antebellum house (Figure 10) may be present within the site area. Historically, Moro Plantation included a series of tenant farmer dwellings and their dependencies; all were aligned along the crest of the natural levee adjacent to Bayou Teche. The Great Depression destroyed the economic viability of the sugar industry, and resulted in the rapid demise of Moro Plantation. Surviving archeological resources at Moro include brick scatters, a large iron band, and sheet refuse. While not located during survey, subsurface remains such as wells and privies probably are present in the site area. The integrity of the site, however, has been compromised. The plantation remains originally extended a few hundred meters farther downstream. The associated downstream remains have been

Table 16

RESULTS OF SURVEY AT ANTICIPATED HISTORIC ARCHEOLOGICAL RESOURCES IN THE SURVEY AREA

Section Number (T15S, R11E)	Description	Date	Source	Resources Located
TERRESTRIAL RESOURCES				
Sections 21 and 41 (west bank of Bayou Teche)	Up to five structures at southwest end of survey area	Twentieth century	Aerial photographs, 1930; 1933, 1941, and 1954 USGS 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 USGS 7.5' series topographic quadrangle, Patterson, Louisiana	Associated modern debris
Edge of Section 41; Section 42 (east bank of Bayou Teche)	House of T. Wilcoxson near center of Section 42	Burned 1862 or 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives)	Possibly within Moro Plantation remains
	Moro Plantation - eight to 10 structures in survey area; all were destroyed by 1966	Postbellum and twentieth century	Aerial photographs, 1930; 1933, 1941, and 1954 USGS 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 USGS 7.5' series topographic quadrangle, Patterson, Louisiana	Moro Plantation, 16SMY73; possible landing at marine survey Anomaly No. 55
Section 43	House of Mrs. Meade in west half of section	Burned 1862 or 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives)	Possibly within Luckland Plantation remains

Sections 43, 18, and 44	Luckland Plantation - approximately 37 plantation structures, including sugar house and bridge; only two outbuildings survived in 1966	Postbellum and twentieth century	*Official Map of the Parish of St. Mary, Louisiana,* 1893 (National Archives); 1930 aerial photographs; 1933, 1941, and 1954 USGS 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 USGS 7.5' series topographic quadrangle, Patterson, Louisiana	Luckland Plantation 16SMY71; landing at marine survey Anomaly No. 40
	Cemetery at west edge of Section 44	Observable in 1941-1954	USGS 15' series topographic quadrangles, 1941 and 1954, Belle Isle, Louisiana	Not located
Section 44	Bridge	Postbellum	*Official Map of the Parish of St. Mary, Louisiana,* 1893 (National Archives)	Area disturbed by pipelines; possibly at marine survey Anomaly No. 36
Sections 45-48	House of A. Fusilier in center of Section 47	Burned 1862 or 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives)	Possibly within Avalon Plantation remains
	Avalon Plantation - approximately 36 plantation structures, including sugarhouse, wharf, and bridge; all were destroyed prior to 1966	Postbellum and twentieth century	*Map showing portion of Avalon Plantation, St. Mary Parish, Louisiana,* 1920. (St. Mary Parish Courthouse, Map Book 1); 1930 aerial photographs; 1933, 1941, and 1954 USGS 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 USGS 7.5' series topographic quadrangle, Patterson, Louisiana	Avalon Plantation, 16SMY70; landing at marine survey Anomaly No. 28
Section 49	Three unidentified buildings in Section 49 vicinity	1862	Carpenter 1886	Not located (source sketch too vague)

	Cemetery at east edge of section	Observable in 1941-1954	USGS 15' series topographic quadrangles, 1941 and 1954, Belle Isle, Louisiana	Not located
	Small building (boathouse?) at head of slip, in west half of section	First half twentieth century	Aerial photographs, 1930	Slip and a few brick fragments located (Segment 4)
Section 50	Cornay's Bridge near east end of section	Destroyed 1862 or 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives); Goodwin, Poplin, and Hewitt 1988	Located during marine survey at Anomaly No. 23 or 24a
	Saunders house and landing and sugarhouse	Postbellum	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)	Not located (imprecise location on map)
	Building at corner of public road parallel to the bayou and road crossing bayou	Twentieth century	Aerial photographs, 1930; 1941 and 1954 USGS 15' series topographic quadrangle, Belle Isle, Louisiana	Modern debris located
	Bridge in west half of section	Postbellum	*Official Map of the Parish of St. Mary, Louisiana*, 1893 (National Archives)	Not located; possibly same bridge as below
	Bridge near east end of section	Postbellum (?) and twentieth century	Aerial photographs, 1930; 1933, 1941, and 1954 USGS 15' series topographic quadrangles, Belle Isle, Louisiana; 1966 USGS 7.5' series topographic quadrangle, Patterson, Louisiana	Located during marine survey at Anomaly No. 23
Sections 50 and 51	Union staging area, near boundary between these sections	1863	Goodwin, Poplin, and Hewitt 1988	Not located

Section 52	*Bethel's lower sugarhouse* (possibly at east end of Section 53) and two associated structures	*Antebellum and Civil War*; sugarhouse damaged or destroyed 1863	*Ca. 1863 Map of St. Mary Parish* (National Archives); 1863 T. Jekyll *Map No. 16, Battlefield of Fort Bisland* (National Archives); *Goodwin, Poplin, and Hewitt 1988*; Carpenter 1886	*Probably within Bethel I, 16SMY68*
	Sugarhouse, possibly a repaired Bethel's lower sugarhouse	Postbellum	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)	Probably within Bethel I, 16SMY68
	Bridge	Postbellum	*Official Map of the Parish of St. Mary, Louisiana*, 1893 (National Archives)	Probably located during marine survey at Anomaly No. 9
Section 54	Possible south flank of principal Confederate earthworks	1863	Goodwin, Poplin, and Hewitt 1988	Not located
	Bethel's Bridge	Destroyed 1862 or 1863	*Ca. 1863 Map of St. Mary Parish* (National Archives); Goodwin, Poplin, and Hewitt 1988	Probably located during marine survey at Anomaly No. 3
	Bridge	Postbellum	*Official Map of the Parish of St. Mary, Louisiana*, 1893 (National Archives)	Probably located during marine survey at Anomaly No. 2
Sections 55 and 56	Second Confederate defensive line along section line separating Sections 55 and 56	1862 and 1863	*Ca. 1863 Map of St. Mary Parish* (National Archives); 1863 T. Jekyll *Map No. 16, Battlefield of Fort Bisland* (National Archives); Goodwin, Poplin, and Hewitt 1988	Portion probably located within Segment W-112

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	Confederate Redoubt #2, near north end of Section 55, along section line separating Sections 55 and 56	1862 and 1863	Ca. 1863 *Map of St. Mary Parish* (National Archives); 1863 T. Jekyll *Map No. 16, Battlefield of Fort Bisland* (National Archives); Goodwin, Poplin, and Hewitt 1988	Destroyed
In Bayou Teche, near Sections 45 and 46	Schooner *John Bowles*, Muddigger *CSS Turtle*, and unnamed Confederate torpedo machine	1863 - 1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives); Trinidad, 1868 *Rough Sketch [of Bayou Teche]* (National Archives)	Possibly located during marine survey at Anomaly Nos. 29, 30 or 35
In Bayou Teche, near Section 49	Schooner loaded with bricks	Pre-1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)	Possibly located during marine survey at Anomalies No. 24a or 25
In Bayou Teche, near Section 50	Liveoak Obstruction	1862	Ca. 1863 *Map of St. Mary Parish* (National Archives); 1870 C. W. Howell *Survey of the Bayou Teche* (National Archives); Goodwin, Poplin, and Hewitt 1988; Raphael 1975	Data imprecise, possibly located downstream in vicinity of Anomalies 36 and 37
	Union caisson near burned Cornay's Bridge	1863	Goodwin, Poplin, and Hewitt 1988	Possibly part of marine survey Anomaly No. 23 or 24a
	Three brick barges	Pre-1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)	Possibly located during marine survey at Anomaly No. 13 or 18
In Bayou Teche, near Section 51	Hull of *Flycatcher*	Sunk 1862	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives); Raphael 1975	Possibly located during marine survey at Anomaly No. 8, 12, or 13

In Bayou Teche, near Section 54	Brick barge	Pre-1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)	Possibly located during marine survey at Anomaly No. 7b or 8
In Bayou Teche, near Section 55	Confederate ship *Cotton*	Sunk 1862	C W. Howell, 1870 *Survey of the Bayou Teche* (National Archives); Raphael 1975	Not located; probably destroyed; debris from the *Cotton* may be included within Anomaly No. 1
	Schooner adjacent to the *Cotton*	Pre-1870	C. W. Howell, 1870 *Survey of the Bayou Teche* (National Archives)	Not located; probably destroyed

damaged extensively by road construction, and probably by riverine cutting. Therefore, the surviving component represents only a small portion of the original site. Archeological deposits from two adjacent upstream plantations, Luckland and Avalon, have survived intact, and both include remains similar to those located at Moro Plantation. In addition, Luckland and Avalon both include extensive in situ sugar house remains, and associated riverine deposits. Both the incompleteness of the site, and the proximity and better archeological integrity of both Luckland and Avalon, reduce the research potential of Moro Plantation. However, insufficient data were collected to complete evaluation of the site complex. While Moro Plantation probably is not significant, additional archeological testing is necessary before it can be evaluated definitively.

Zenor (16SMY72) is a late nineteenth to early twentieth century site located a short distance downstream from Luckland Plantation. Four brick scatters and sheet refuse were observed across the site. A total of 28 shovel tests and three 1 x 2 m excavation units were placed within the site (Figure 21). The recovered artifacts suggest that the site was in use until the 1930s. Two units placed within Brick Scatter A revealed a small in situ brick foundation positioned along the bank of Bayou Teche. The foundation also was associated with a small magnetic anomaly located during magnetometer survey of the Bayou Teche channel. The size and morphology of the feature, its horizontal location, and its association with the riverine magnetic anomaly, all indicate that the feature probably functioned as the foundation of a pumphouse. Since the nearby agricultural fields were cultivated in rice during the early twentieth century, it is probable that the pumphouse was used to inundate those fields. The shovel tests and excavation unit placed in the other three brick scatters produced no evidence of in situ cultural deposits.

Based on data collected at Zenor during site testing, one in situ feature has survived within the site. Excavations at the foundation provided morphological and contextual data, and sufficient information to interpret the foundation's probable function. However, the site possesses limited archeological integrity, and the site lacks substantive research potential. Therefore, it does not possess the quality of significance as defined by the National Register of Historic Places significance criteria [36 CFR 60.4 (a-d)]. No additional work at Zenor (16SMY72) is recommended.

Luckland Plantation (16SMY71) consists of the archeological remains of the east bank portion of a postbellum and early twentieth century plantation. Archeological deposits include numerous in situ sugar house foundation remains, other brick foundations, a modified Acadian shed, landing remains, tenant farmer residences, and several brick scatters (Figures 26 and 27). The site possesses archeological integrity. In addition, few postbellum and early twentieth century plantation complexes have survived intact with little post-occupation disturbance, and none in the region has been studied extensively. The research potential at Luckland is good for learning about postbellum and early twentieth century sugar production, plantation settlement patterns along the Teche, the socio-economy of tenant farmers, and about plantation landing

construction and use. The site appears to possess the quality of significance, as defined by the National Register of Historic Places criteria.

The postbellum and early twentieth century site of Avalon Plantation (16SMY70) is located directly upstream from Luckland Plantation. It consists of archeological deposits similar to those previously described for Luckland, including extensive sugar house remains, numerous dependencies, a landing, and tenant farmer residences (Figures 28 and 29). The probable remains of the Avalon Plantation floating swing bridge is submerged just upstream from the plantation landing. The site possesses archeological integrity and has research potential. Historical data available for Avalon Plantation include a 1920 plan (Figure 16), and an early twentieth century photograph showing the plantation sternwheeler, part of the sugar house, and a portion of the associated bridge. Avalon Plantation (16SMY70) appears to possess the quality of significance as defined by National Register of Historic Places criteria.

As stated above, archeological evidence indicates that Luckland Plantation (16SMY71), Avalon Plantation (16SMY70), and possibly Moro Plantation (16SMY73), possess the quality of significance. These sugar plantations are associated with one important cultural theme identified in *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983): Plantation Archeology. Based on their known historic development, as discussed in Chapter V, these plantations cultivated and processed sugar cane from the 1870s into the early 1920s. Archeological and historical evidence indicate that numerous houses and dependencies of the plantation laborers aligned the bayou within these sites, along the crest of the natural levee. In addition, the well-preserved remains of the Luckland Plantation and Avalon Plantation sugar houses, along with their bridge and landing remains, are located within these two sites. Important antebellum remains also may occur within them. Other than razing of structures, rather few post-abandonment disturbances have occurred within Luckland and Avalon, and possibly within portions of Moro. The archeological importance of sugar plantations such as Luckland and Avalon is underscored by *Louisiana's Comprehensive Archaeological Plan*:

> Very little archaeological work has been accomplished on sugar plantations in the United States. With the rapid development of the land along Bayou Teche, most of the plantations are in danger, with only the great homes being saved. Knowledge of life on US sugar plantations needs to be expanded through archaeology. How do these plantations compare to those in the West Indies and cotton plantations to the north? (Smith et al. 1983:66)

The degree of preservation, and the completeness of plantation habitation and industrial complexes, indicate that a number of important research questions and goals could be addressed by additional archeological investigations at Luckland and Avalon

Plantations, and possibly at Moro Plantation. The historic archeological deposits at these plantations possess several areas of significance. The well-preserved sugar house remains can provide important information about postbellum and early twentieth century sugar house construction and operation. Tenant farmer residence remains, and associated sheet refuse, contain data important for understanding better the lifeways of plantation workers and their families. Since most of these residents were black, ethnic distinctions within the archeological record also may be discernable. Transportation resources include landing remains, possibly including sunken vessels, and plantation bridge remains. In addition, comparison of archeological data from these proximate, interrelated plantation complexes may provide important information about similarities and diversities between sugar plantations, and how the differences complemented each other.

Bethel II (16SMY69) consists of antebellum and postbellum remains situated in a cane field located a short distance east of Rizzo Bridge. Soft mud brick fragments were scattered throughout the site; higher concentrations were noted within three areas (Figure 31). Artifact concentrations observed within the site suggests two components. One, located along the east end of the site, is an antebellum component containing a variety of decorated pearlware and early whiteware sherds, redware, glass, and brick fragments, including glazed brick. The other component is postbellum. It is concentrated within the western 100 m of the site, and contains post-Civil War material. Because the site lies within a cane field, the cultural deposits probably are disturbed. Also, no in situ archeological deposits were observed within any of the 27 shovel tests placed in the site. Additional subsurface testing, however, would be necessary to ascertain whether or not intact features exist outside of the project area. The antebellum component, in particular, may be important because of the dearth of documented intact antebellum sites in the parish. That component is located just north of the project area under consideration here. That portion of the site within the current project right-of-way does not contain significant, intact cultural materials.

Bethel I (16SMY68) lies on the natural levee crest east of the Rizzo Bridge. It represents the probable location of Bethel's Lower Sugar House, east bank, and of a nearby brick kiln. Testing demonstrated that the site possessed both antebellum and postbellum components. Many antebellum and postbellum artifacts were recovered from the site, and an extensive scatter of soft mud bricks also was noted. A few features were observed; these included a probable mid-nineteenth century ditch, and a possible terminal nineteenth to early twentieth century posthole. Despite the excavation of numerous shovel tests, and of three 1 x 2 units and two backhoe trenches, as well as a magnetometer and metal detector survey, no in situ foundation or structural remains, except for the possible posthole, were observed. While the site possessed moderate archeological integrity, testing at Bethel I failed to demonstrate substantive research potential. The site does not possess the quality of significance as defined by National Register of Historic Places criteria. No further testing is recommended at Bethel I (16SMY68).

Calumet (16SMY67) consists of the damaged early to mid twentieth century remains of two structures situated toward the western end of the project area. During survey, stiff mud bricks and a moderate amount of twentieth century debris were observed within the site. Towards the west end of the site, several large earthen mounds and broad pits also were observed. Much of the site's ground surface was disturbed extensively by clearing with heavy machinery clearing during the 1970s or 1980s. With the possible exception of a small brick pier, no in situ features or deposits were located during survey. Because of the recency of the site, which was occupied until the 1960s, the poor archeological integrity, and due to the site's limited research potential, it does not possess the quality of significance as defined by National Register of Historic Places criteria. No further testing at Calumet is recommended.

Archeological survey along the Wax Lake Outlet, within Bisland (16SMY166), was designed to locate and to identify surviving battlefield features. In addition to a tram bed, a canal, a former protection levee, and several agricultural field drainage ditches, the probable remnant of the Confederate secondary line of defense was located. This remnant comprises a 3 to 4 m wide ditch with an approximate 3 degree orientation. Eroded spoil banks, each 10 to 20 cm high, align the edges of the ditch. It extends from the Wax Lake Outlet southward to an old protection levee and canal. The portion which extends under an elevated gas pipeline is filled. Site testing included an intensive metal detector survey of the possible earthworks, and bisection of the ditch with a backhoe trench. During the metal detector survey, modern debris, much of it deposited during construction of the nearby elevated pipeline, was located along and adjacent to the ditch. No artifacts associated with the Civil War were recovered. This lack of Civil War artifacts may reflect the thick deposit of twentieth century fill that covers the floor of the ditch. The backhoe trench revealed the ditch's morphology, but failed to verify whether or not the ditch was in fact the remains of the secondary Confederate line of defense. While not demonstrated archeologically, both the orientation and location of the ditch strongly suggest that it is the remains of the Confederate earthworks. However, a 1930 Corps of Engineers aerial photograph clearly shows that the surviving ditch was used for drainage. If the ditch is part of the defensive line, then it subsequently was converted into an agricultural feature. This probably resulted in substantial modification to the original morphology of the ditch, adversely impacting its archeological integrity. Therefore, this earthwork remnant lacks archeological integrity, and it has limited research potential; it is not a significant component of the Bisland battlefield (16SMY166), and it is not eligible for the National Register. No further testing of this earthwork remnant is recommended. Finally, a key portion of the Confederate line, Redoubt No. 2, probably was destroyed by riverine cutting along the Wax Lake Outlet.

Recommendations

Seven archeological sites were identified during survey of the Bayou Teche project area. Two of these possess the quality of significance as defined by National Register of Historic Places criteria: Luckland Plantation (16SMY71), and Avalon Plantation

(16SMY70). Three sites, Zenor (16SMY72), Bethel I (16SMY68), and Calumet (16SMY67), do not possess the quality of significance as defined by the National Register of Historic Places criteria. No additional testing is recommended at these three sites, and the planned dredge and dredge disposal activities will have no effect on significant cultural resources in these areas. Significant archeological deposits may occur along the crest of the natural levee at Moro Plantation (16SMY73); however, that portion of the site adjacent to Bayou Teche does not contain significant cultural deposits. A final site, Bethel II (16SMY69), does not contain significant deposits within the planned project corridor. However, this site may contain significant deposits and/or in situ features within the confines of the historic plantation but outside of the area examined intensively herein.

Luckland Plantation, which contains both postbellum and early twentieth century plantation remains, is located west of Moro Plantation, on North Luckland Farms. As mentioned earlier, this site possesses the quality of significance as defined by National Register of Historic Places criteria. Numerous visible in situ remains are located in the vicinity of the sugar house and landing. In addition, in situ deposits are anticipated along the entire length of the previously occupied ridge and adjacent to the shell and gravel road. Based on known settlement patterns within Luckland, it is recommended that dredged material not be deposited within the landing area, approximately 150 m (500 ft) on either side of the sugar house. Dredged material should be confined to the south edge of the site, excluding the landing area, between the lower half of the natural levee ridge, and Bayou Teche to the south. Historic maps of the property indicate no significant occupations or activity areas, other than the landing area, located immediately adjacent to Bayou Teche, and between the lower half of the natural levee and the bayou. Augering and the extant vegetation indicates this area was utilized previously for dredged material placement.

Avalon Plantation is located directly west of Luckland. Avalon Plantation is a significant cultural resource. It possesses considerable research potential concerning postbellum and early twentieth century plantation life and sugar production along Bayou Teche. As with Luckland Plantation, in situ archeological deposits occur in the sugar house area, and they are anticipated near the landing and along the natural levee ridge in the western two-thirds of the site. However, the eastern third of the plantation, from its east end to the designated No Work Area, contains few, if any, in situ structural or occupation-related deposits associated with the plantation. Therefore, it is recommended that dredged material be placed only within the eastern third of Avalon Plantation, east of the small No Work Area. Dredged material should not be placed near the former landing area, i.e., within approximately 150 m (500 ft) of either side of the sugar house remains. Within the remaining portion of Avalon Plantation, dredged material should be confined to the southern edge of the natural levee ridge, between the lower portion of the ridge and Bayou Teche to the south.

As discussed previously, Bethel II contains both antebellum and postbellum archeological deposits. Within the project area under consideration here, no significant

archeological deposits from the Bethel II site have been recovered. However, the antebellum component of the site which is outside of the project area may contain significant deposits and has not been fully evaluated. Therefore, although dredge disposal as planned will have no effect on significant cultural resources, that disposal should be strictly confined to the project limits and care should be taken to avoid any effect to the antebellum component located immediately north of the project boundary.

Moro Plantation is situated on the east bank of Bayou Teche, at the east end of the project area. Archeological remains associated with tenant farmer residences were observed throughout the site area; the bulk of the remains are situated on the ridge of the natural levee adjacent to the shell and gravel road. Because of the lack of observed in situ remains, and the proximity of similar, contemporaneous, better preserved sites, Moro Plantation may not possess the quality of significance as defined by National Register of Historic Places criteria. However, this has not been confirmed by archeological testing; with the exception of shovel tests no archeological units have been excavated at this site. Site occupation occurred primarily along the ridge parallel to Bayou Teche. Therefore, if dredge disposal is confined between the ridge and the lower half of the natural levee and Bayou Teche, it will have no effect of the site regardless of its significance and National Register eligibility. If it is necessary to place dredged materials beyond the designated no effect zone, then additional testing should be undertaken. That testing should focus on hand excavation in order to ascertain the presence, archeological potential, and integrity of the archeological deposits from the domestic tenant farmer occupations.

Marine Archeological Resources

Summary

A total of 62 magnetic anomalies were recorded during magnetometer survey of Bayou Teche (Tables 14 and 15). Nearly two-thirds of these anomalies either can be associated with modern or historic occurrences or they will not be impacted by the dredge project. Several of these were associated with modern objects, including pipelines (Anomalies Nos. 6, 7a, 15, 36, 37, and 46), the existing Rizzo Bridge (Anomaly 24b), several historic bridges (Anomalies Nos. 23, 28, and 40), a modern shipyard (Anomaly No. 24b), a docking facility (Anomaly No. 24b), sunken mid-to-late twentieth century vessels (Anomalies Nos. 27, 52, and 61), and trot lines (Anomalies Nos. 59, and 60). Others had historic associations, including a number of recorded sunken vessels, several landings and docks, and possibly an intake for the pumphouse remains at Zenor Plantation (16SMY72). Finally, a number of anomalies did not have known modern or historic associations.

Eight of the recorded magnetic anomalies without known modern associations may be impacted by the planned dredging of the bayou. These include Anomalies Nos. 8, 13,

24a, 29, 30, 31, 33 and 58. Four of these appear to be the remains of sunken vessels: the *Flycatcher* (Anomaly No. 8); three brick barges (Anomaly No. 13); the muddigger *CSS Turtle* (Anomaly No. 29); and the Schooner *John Bowles* (Anomalies Nos. 30, 31, and 33).

Several of the magnetic anomalies are associated with historic bridges. These are: Cornay's Bridge (Anomaly No. 24a), and several twentieth century bridges (Anomalies Nos. 23, 28, and 40). The live oak obstruction located near Muggah's Upper Line (Figure 11) apparently was situated near Anomalies Nos. 36 and 37. Pipeline crossings at these points have masked any other magnetic anomalies.

Recommendations

As discussed above, 62 magnetic anomalies were identified during survey of the lower Bayou Teche (Tables 14 and 15). Fourteen anomalies fall within or near the planned channel corridor and will be impacted by the proposed dredging. Only eight of these anomalies require further testing. These are: Anomalies Nos. 8, 13, 24a, 29, 30, 31, 33, and 58.

Anomaly No. 8 is a complex dipolar anomaly which measured 150 x 400 ft. The anomaly possessed a magnetic inflection of over 140 gammas; it is located within the proposed channel corridor. This area may be the approximate location of the wreck of the *Flycatcher* (Figure 11). Additional work is recommended to assess the significance of Anomaly No. 8.

Anomaly No. 13 is a dipolar anomaly which measured 50 x 110 ft. The anomaly produced a magnetic inflection of 120 gammas. The anomaly is located inside the impact corridor; it appears to be at the approximate location of three brick barges shown on the Howell Map (Figure 11). Further investigation of this anomaly is recommended.

Anomaly No. 24a is a dipolar anomaly which extends into the projected dredge impact corridor. The anomaly measured 150 x 550 ft, and produced an inflection of 75 gammas. Anomaly No. 24a coincides with the historic location of Cornay's Bridge (Figure 11). The *CSS Alligator* also may be located in this general vicinity. Additional testing at Anomaly No. 24a is recommended to verify this association.

Anomaly No. 30 is located within the impact corridor. It measures 50 x 150 ft and has a dipolar configuration. The anomaly produced an inflection of approximately 70 gammas and appears to be associated with the schooner *John Bowles* and an historic landing. Further work to assess the significance of Anomaly No. 30 is recommended.

Anomaly No. 31 is a complex dipolar anomaly that extends into the planned dredge impact corridor. The anomaly produced a magnetic inflection of over 290 gammas. Pilings were located on the left bank of the area suggesting the area's use as a dock or

landing. In addition, the area is the approximate location of the wreck of the schooner *John Bowles*. Additional work at Anomaly No. 31 is required to assess its nature, historical association, and significance.

Anomaly No. 33 is complex and dipolar and measured 150 x 550 ft and produced an inflection of over 160 gammas. It falls partially within the impact corridor; like the two preceding anomalies, it may be derived from the wreck of the schooner *John Bowles*. Further work at Anomaly No. 33 is recommended.

Anomaly No. 58 is a monopolar anomaly that produced an inflection of over 200 gammas. The anomaly has a complex signature; however, it is not associated with any known historic event. Further work is warranted at this anomaly to assess its historical significance.

Additional fieldwork at each of the aforementioned anomalies is required to identify the source of the magnetic reading, and more importantly, to assess historical significance. Further assessment of these anomalies will require diving to explore the channel bottom; in addition, some excavation may be required to uncover the source of these readings. This additional excavation should be preceded by detailed magnetic and fathometer survey. These surveys should provide additional information regarding the extent of the anomaly, bottom conditions, and the locations of any ferrous concentrations. A physical search of the water bottom, metal detector survey, and probing with metal rods or jet pumps should be used to assess each anomaly. These methods should enable the location of each anomaly, determination of depth below river bottom, and definition of extent. Further excavation may be needed to identify the source of some of these anomalies.

REFERENCES CITED

Autin, Whitney J., Scott F. Burns, Bobby J. Miller, Roger T. Saucier, and John J. Snead
1990 Quaternary Geology of the Lower Mississippi River Valley. In *Quaternary Nonglacial Geology, Conterminous U.S.,* edited by R. B. Morrison, pp.20-56, The Geology of North America, v. K-2, Geological Society of America, Boulder.

Berman, Bruce D.
1972 Encyclopedia of American Shipwrecks. The Mariners Press, Inc. Boston.

Booth, Andrew B.
1984 *Records of Louisiana Confederate Soldiers and Louisiana Confederate Commands.* The Reprint Company. Spartanburg, South Carolina.

Botkin, B. A., editor
1945 *Lay My Burden Down: A Folk History of Slavery.* University of Chicago Press. Chicago, Illinois.

Bouchereau, Alcee
1917 *Statement of the Sugar and Rice Crops, Made in Louisiana* (1877-1917). Pelican Steam and Job Printing. New Orleans, Louisiana.

Bouchereau, Louis
1877 *Statement of the Sugar and Rice Crops Made in Louisiana* (1868-1877). Pelican Steam Book and Job Printing. New Orleans, Louisiana.

Broussard, Beverly Bernard, and Raymond L. Broussard
1955 *A History of St. Mary Parish.* Franklin, Louisiana. No publisher listed.

Brasseaux, Carl A.
1979 New Iberia's Steamboat Days. In *New Iberia - Essays on the Town and Its People*, edited by Glenn R. Conrad, pp. 210-219. University of Southeastern Louisiana, Center for Louisiana Studies, Lafayette.

Businelle, Lynda J.
1986 *The 1860 St. Mary Parish Census.* Published by Lynda J. Businelle. Morgan City, Louisiana.

Cantley, Charles E., John Kern, Edwin Jackson, Joseph Schuldenrein, and Nancy Bernstein

1984 *Cultural Resources Evaluations at Fort Polk, Louisiana.* Submitted to Interagency Archeological Services-Atlanta National Park Service, by Gilbert/Commonwealth Inc. Contract No. CX5000-3-1094.

Champomier, P. A.

1862 *A Statement of the Sugar Crop Made in Louisiana* (1844-1862). Cook and Young. New Orleans.

Conrad, Glenn R., general editor

1988 *A Dictionary of Louisiana Biography*, 2 volumes. Louisiana Historical Association. New Orleans, Louisiana.

Conrad, Glenn R.

1979 A Road for Attakapas. *Attakapas Gazette* 14:30-36.

DAR

1931 *Marriage Records, St. Mary Parish Court House.* No publisher or place of publication.

Darby, William

1816 *Geographical Description of the State of Louisiana.* John Melish. Philadelphia.

Degelos, Pierre A.

1892 Statement of the Sugar Made in Louisiana in 1828 and 1829. *Louisiana Planter and Sugar Manufacturer.* IX:65-68.

De Grummond, Jewel Lynn Delaune

1949 A Social History of St. Mary Parish, 1845-1860. *Louisiana Historical Quarterly* 32:17-102.

Department of Commerce Bureau of Navigation

1911, *Merchant Vessels of the United States.*
1914

Dury, G. H.

1964 *Principles of Underfit Streams.* U.S. Geological Survey Professional Paper 452-A, Reston, Virginia.

1965 *Theoretical Implications of Underfit Streams.* U.S. Geological Survey Professional Paper 452-B, Reston Virginia.

Edmunds, David C.
1979 *Yankee Autumn in Arcadiana: A Narrative of the Great Texas Overland Expedition.* Acadiana Press. Lafayette, Louisiana.

Fike, Richard E.
1987 *The Bottle Book: A Comprehensive Guide to Embossed Medicine Bottles.* Gibbs M. Smith, Inc., Peregrine Smith Books, Salt Lake City.

Fisk, Harold N.
1952 *Geological Investigation of the Atchafalaya Basin and the Problem of Mississippi River Diversion.* Army Engineer Waterways Experimental Station, Vicksburg, Mississippi.

Ford, James A.
1951 Greenhouse: A Troyville-Coles Creek Period Site in Avoyelles Parish, Louisiana. *American Museum of Natural History, Anthropological Papers* 44(1).

1969 A comparison of Formative Culture in the Americas: Diffusion or the Psychic Unity of Man. *Smithsonian Contributions to Anthropology,* Vol. II. Smithsonian Institution, Washington, D.C.

Ford, James A. and George I. Quimby
1945 *The Tchefuncte Culture, an Early Occupation of the Lower Mississippi Valley.* Memoir No. 2, Society for American Archaeology. Menasha, Wisconsin.

Ford, James A., and Clarence H. Webb
1956 Poverty Point, A Late Archaic Site in Louisiana. *American Museum of Natural History, Anthropological Papers* 46(1).

Fuller, Richard S.
1985 *Archeological Survey of the Southern Boeuf Basin, Louisiana: 1984.* Lower Mississippi Survey, Cambridge, Massachusetts.

Frazier, David E.
1967 Recent Deltaic Deposits of the Mississippi River, Their Development and Chronology. *Transactions of the Gulf Coast Association of Geological Societies* 7:287-315.

1974 *Depositional - Episodes: Their Relationship to the Quaternary Stratigraphic Framework of the Northwestern Portion of the Gulf Basin.* Texas Bureau of Economic Geology Geological Circular 74-1, Austin, Texas, p. 28.

Gagliano, Sherwood M.
1967 Occupation Sequence at Avery Island. *Coastal Studies Series* No. 22. Edited by W. G. McIntire. Louisiana State University Press, Baton Rouge, Louisiana

Gagliano, Sherwood M., Richard A. Weinstein and Eileen K. Burden
1975 *Archeological Investigations Along the Gulf Intracoastal Waterway: Coastal Louisiana Area.* Report submitted by Coastal Environmenta, Inc., to the New Orleans District, U.S. Army Corps of Engineers.

Gagliano, Sherwood M., Richard A. Weinstein, Eileen K. Burden, Katherine L. Brooks, Wayne P. Glander
1979 *Cultural Resources Survey of the Barataria, Segnette, and Rigaud Waterways Jefferson Parish, Louisiana.* Submitted to the U.S. Army Corps. of Engineers, New Orleans District Contract No. DACW 29-77-D-0272.

Gibson, Jon L.
1975 *Archeological Survey of Bayou Teche, Vermilion River, and Freshwater Bayou, South Central Louisiana.* The University of Southwestern Louisiana, Lafayette, Louisiana.

1982 The Troyville-Baytown Period in Lower Mississippi Valley Prehistory: A Memorial to Robert Stuart Neitzel. *Louisiana Archaeology* 9:31-63. Louisiana Archaeology Society, Lafayette, Louisiana.

Gibson, Jon L., Robert B. Gramling, Steven J. Brazda, Stephen Truax, Michael J. Nault, and Kathleen Mary Byrd
1978 *Archaeological Survey of the Lower Atchafalaya Region, South Central Louisiana.* Submitted to the U.S. Army Core of Engineers, New Orleans District, Louisiana by the University of Southwestern Louisiana Center for Archaeological Studies. Contract No. DACW29-77-C-0083.

Gilmore, A. B.
1917 *Directory of Louisiana Sugar Planters.* The Sugar Planters' Journal. New Orleans.

Glass, J. S.
1898 *St. Mary Parish.* J. S. Glass. Franklin, Louisiana.

Godden, Geoffrey A.
1964 *Encyclopaedia of British Pottery and Porcelain Marks.* Bonanza Books, New York.

Goodwin, R. Christopher, Stephen Hinks, William P. Athens, and Paul V. Heinrich
1990 *Historical and Archeological Investigations of Fort Bisland and Lower Bayou Teche, St. Mary Parish, Louisiana, Preliminary Report.* Submitted by R. Christopher Goodwin & Associates, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

Goodwin, R. Christopher and Kenneth R. Jones
1986 *Cultural Resources Survey of the Wax Lake Outlet Control Weir, Atchafalaya Basin, Louisiana, Project.* Submitted by R. Christopher Goodwin & Associates, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

Goodwin, R. Christopher, Eric C. Poplin, and Lawrence L. Hewitt
1988 *The Battle of Fort Bisland: Historical Research and Development of an Archeological Research Design.* Submitted by R. Christopher Goodwin & Associates, Inc., to the U.S. Army Corps of Engineers, New Orleans District.

Goodwin, R. Christopher, Jill-Karen Yakubik, Galloway W. Selby, and Kenneth R. Jones
1985 *Cultural Resources Survey of the Morgan City and Vicinity Hurricane Protection Project.* Submitted by R. Christopher Goodwin & Associates, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

Gould, H. R. and J. P. Morgan
1962 Field Trip No. 9, Coastal Louisiana Swamps and Marshes. In *Geology of the Gulf Coast and Central Texas and Guidebook of Excursions,* edited by E. H. Rainwater and R. P. Zingula, pp. 287-341, 1962 Annual Meeting Guidebook, Geological Society of America, Boulder, Colorado.

Greengo, Robert E.
1964 Issaquena: An Archaeological Phase in the Yazoo Basin of the Lower Mississippi Valley. *Society for American Archaeology, Memoirs* 18.

Gurcke, Karl
1987 *Bricks and Brickmaking: A Handbook for Historical Archaeology.* University of Idaho Press, Moscow, Idaho.

Hansen, Harry
1941 *Louisiana: A Guide to the State.* Hastings House. New York.

Heitman, John Alfred
1987 *The Modernization of the Louisiana Sugar Industry, 1830-1910.* Louisiana State University Press. Baton Rouge, Louisiana.

Hinks, Stephen
1988 *A Structural and Functional Analysis of Eighteenth Century Buttons.* Unpublished M.A. thesis, Department of Anthropology, College of William and Mary, Virginia, Williamsburg.

Howell, Major C.W.
1870 *Survey of Bayou Teche*, Plate 3. National Archives, Cartographic Division, Records Group 77, Civil Works Map File, M137-1. Washington, D.C.

Jones, Olive and Catherine Sullivan
1985 *The Parks Canada Glass Glossary.* Studies in Archaeology, Architecture and History, National Historic Parks and Sites Branch, Parks Canada.

Kovel, Ralph and Terry Kovel
1977 *Dictionary of Marks - Pottery and Porcelain.* Crown Publishing, New York. Reprint of the 1953 edition.

1986 *Kovel's New Dictionary of Marks: Pottery and Porcelain 1850 to the Present.* Crown Publishers, Inc. New York.

Kuttruff, Carl
1975 The Poverty Point Site: North Sector Test Excavations. *Louisiana Archaeology* 2:129-151.

Lehner, Lois
1988 *Lehner's Encyclopedia of U.S. Marks on Pottery, Porcelain, & Clay.* Collector Books, Paducah, Ky.

Lenzer, J.P.
1977 Geology and Geomorphology. In *The Hanna Site: An Alto Village in Red River Parish,* edited by P.T. Thomas, L.J. Campbell, and S.R. Ahler, pp. 32-50, New World Research Report of Investigations No.3.

Louisiana Planter and Sugar Manufacturer
1904 August 20:117.

1923 *The Reference Book of the Sugar Industry of the World.* Louisiana Planter and Sugar Manufacturer. New Orleans, Louisiana.

1929 *The Reference Book of the Sugar Industry of the World.* Louisiana Planter and Sugar Manufacturer. New Orleans, Louisiana.

Lower Bayou Teche Tourist Commission
1986 *Franklin, Louisiana.* John Landry. Franklin, Louisiana.

Lytle, S.A., B. F. Grafton, Alexander Ritchie, and H. L. Hill
1959 *Soil Survey of St. Mary Parish, Louisiana.* USDA Soil Conservation Service, Washington, D.C.

Marquette, C. L., editor
1940 Letters of a Yankee Sugar Planter. *Journal of Southern History* VI:521-546.

McIntire, W. G.
1958 *Prehistoric Indian Settlements of the Changing Mississippi River Delta.* Coastal Studies Series No. 1. Louisiana State University Press, Baton Rouge.

Menn, Joseph Karl
1964 *The Large Slaveholders of Louisiana - 1860.* Pelican Publishing Company. New Orleans, Louisiana.

Miller, George
n.d. Date Ranges for the Periods of Highest Popularity and Production for the Different Types of Shell Edge Decorated Pearl and White Wares. Unpublished Manuscript.

Miller, George L.
1980 Classification and Economic Scaling 19th Century Ceramics. *Historical Archaeology* 14: 1-40. Society for Historical Archaeology.

Millet, Donald J.
1983 Southwest Louisiana Enters the Railroad Age: 1880-1900. *Louisiana History* 24(2):165-183.

Morgan, J. P.
1976 Louisiana Deltaic Geology. In *Guidebook Louisiana Deltaic Plain and Its Salt Domes,*edited by D. H. Kupfer and J. P. Morgan, pp. 1-17 American Association of Petroleum Geologists/Society of Economic Paleontologists and Mineralogists Field Trip, May 24-26, 1976, American Association of Petroleum geologists, Tulsa, Oklahoma.

Muller, Jon
1983 The Southeast. In *Ancient North Americans.* Edited by Jesse D. Jennings. W. H. Freeman and Company, New York.

Munsey, Cecil
1970 *The Illustrated Guide to Collecting Bottles.* Hawthorn Books, Inc., New York.

Murphy, Larry E. and A. R. Saltus, Jr.
1990 Considerations of Remote Sensing Limitations to Submerged Historical Site Survey. *Underwater Archaeology from the Society for Historical Archaeology conference*. Society for Historical Archaeology, Tucson, Arizona.

Neitzel, Robert S. and J. Stephen Perry
1977 *A Prehistory of Central and North Louisiana*. Ms. Submitted to the Research Institute, Northeast Louisiana University.

Nelson, Lee H.
1963 Nail Chronology as an Aid to Dating Old Buildings. In *American Association of State and Local History*. Technical Leaflet 15.

Neuman, Robert W.
1973 *An Archaeological Assessment of Water Resource Planning Areas 9 and 10, Louisiana*. Report on file, Louisiana Division of Archaeology, Department of Culture, Recreation and Tourism.

1977 *Mélanges*. An Archaeological Assessment of Coastal Louisiana. Report on file, Museum of Geoscience, Louisiana State University, Baton Rouge, Louisiana.

1977 An Archaeological Assessment of Coastal Louisiana. *Melanges No. 11*, Museum of Geoscience, Louisiana State University, Baton Rouge.

1984 *An Introduction to Louisiana Archaeology*. Louisiana State University Press, Baton Rouge.

Neuman, Robert W. and A. Frank Servello
1976 *Atchafalaya Basin Archaeological Survey*. Submitted by the Department of Geography and Anthropology, School of Geoscience, Louisiana State University, to the New Orleans District, U.S. Army Corps of Engineers.

Pearson, Charles E., George J. Castille, Donald Davis, Thomas E. Redard, and Allen R. Saltus
1989 *A History of Waterborne Commerce and Transportation within the U.S. Army Corps of Engineers, New Orleans District and an Inventory of Known Underwater Cultural Resources*. Submitted by Coastal Environment, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

Pearson, Charles E., David B. Kelly, Richard A. Weinstein, Sherwood M. Gagliano
1986a Dating the course of the Lower Red River in Louisiana: the archeological evidence. *Geoarchaeology* v. 1:39-43.

1986b *Archaeological Investigations on the Outer Continental Shelf: a Study within the Sabine River Valley, Offshore Louisiana and Texas.* Coastal Environments, Inc., Baton Rouge.

Pearson, Charles E. and A. R. Saltus, Jr.
1989 *Remote Sensing Survey of the Atchafalaya Basin Main Channel, Atchafalaya Basin Training Project, Sts. Mary and Martin Parishes, Louisiana.* Submitted by Coastal Environment, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

Penland, Shea, Daren E. Ramsey, Randolph A. McBride, John T. Mestayer, and Karen Westphal
1988 Relative Sea Level Rise and Delta Plain Development in the Terrebone Parish Region Louisiana Geological Survey Coastal Geology Technical Report No. 4, Louisiana Geological Survey, Baton Rouge, 120 p.

Perrin, William Henry, editor
1891 *Southwest Louisiana: Biographical and Historical.* Gulf Publishing Company. New Orleans, Louisiana.

Phillips, Philip
1970 Archeological Survey in the Lower Yazoo Basin, Mississippi, 1949-1955. *Papers of the Peabody Museum,* Vol. 60. Harvard University, Cambridge, Massachusetts.

Phillips, Ulrich Bonnell
1929 *Life and Labor in the Old South.* Little Brown and Company. Boston, Massachusetts.

Pittman, William E.
1987 *Laboratory Manual.* Office of Archaeological Excavation, Department of Archaeology, Colonial Williamsburg Foundation.

Ramsay, John
1947 *American Potters and Pottery.* Tudor Publishing Company, New York.

Raphael, Morris
1975 *The Battle in the Bayou Country.* Harlo Press, Detroit.

Roland, Charles P.
1957 *Louisiana Sugar Plantations During the American Civil War.* E. J. Brill. Leiden.

S P Bulletin
1952 *A Century of Progress in Louisiana.* Southern Pacific Texas and Louisiana Lines. Souvenir Reprint. No place of publication.

St. Mary Parish Planning Board
1949 *St. Mary Parish Resources and Facilities.* Planning Division, Department of Public Works. Baton Rouge, Louisiana.

Saltus, Allen R., Jr.
1982 *Cultural Resources Survey of a Portion of the Northeast Cape Fear River and Report on the Test Excavation to Evaluate the Steamship Spray.* Prepared for Atlantic Salvesen, and the North Carolina Division of Archives and History, Underwater Archeological Research Unit, Kure Beach, North Carolina.

1984 *Survey of Portions of the Mississippi River, Including Segements of Lower Childress - Fort Jackson and Venice, Louisiana Areas.* Prepared by the author for the U.S. Army Corps of Engineers, New Orleans District.

Saucier, R. T.
1974 *Quaternary Geology of the Lower Mississippi Valley.* Arkansas Archeological Survey Research Series No. 8, Fayetteville, p. 26.

Shenkel, J. Richard
1984 Early Woodland in Coastal Louisiana. In *Perspectives on Gulf Coast Prehistory.* Edited by Dave D. Davis pp.41-71. University of Florida Press/Florida State Museum, Gainesville, Florida.

Sitterson, J. Carlyle
1953 *Sugar Country: The Cane Sugar Industry in the South.* The University of Kentucky Press. Lexington, Kentucky.

Smith, Lawson M., Joseph B. Dunbar, and Louis D. Britsch
1986 *Geomorphological Investigation of the Atchafalaya Basin, Area West, Atchafalaya Delta, and Terrebonne Marsh.* U.S. Army Engineer Waterways Experimental Station Technical Report GL-86-3. Vicksburg, Mississippi.

Smith, Steven D., Philip G. Rivet, Kathleen M. Byrd, and Nancy W. Hawkins
1983 *Louisiana's Comprehensive Archaeological Plan.* State of Louisiana, Department of Culture, Recreation and Tourism, Officer of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana.

Struever, Stuart

1964 The Hopewell Interaction Sphere in Riverine-Western Great Lakes Culture History. In *Hopewellian Studies,* edited by J. Caldwell and R.L. Hall. Scientific Papers 12:3, Illinois State Museum.

Struever, Stuart and Kent D. Vickery

1973 The beginnings of Cultivation in the Midwest-riverine area of the United States. *American Anthropologist* 75:197-220.

Suter, John R., Henry L. Berryhill, and Shea Penland

1987 Late Quaternary Sea-Level Fluctuations and Depositional Sequences, Southwest Louisiana Continental Shelf. In *Sea-Level Fluctuations and Coastal Evolution,* edited by Dag Nummedal, Orrin H. Pilkey, and James D. Howard, p. 199-222, Society of Economic Paleontologists and Mineralogists Special Publication No. 41. Society of Economic Paleontologists and Mineralogists, Tulsa, Oklahoma.

Toth, Edwin Alan

1977 Early Marksville Phases in the Lower Mississippi Valley: A Study of Culture Contact Dynamics. Ph.D. Dissertation presented to the Department of Anthropology, Harvard University, Cambridge, Massachusetts.

Toulouse, Julian Harrison

1971 *Bottle Makers and Their Marks*. Thomas Nelson Inc., Camden, New Jersey.

Trinidad, Captain E.B.

1868 *Rough Sketch [of Bayou Teche]*. National Archives, Cartographic Divison, Washington, D.C.

U.S. Army Corps of Engineers

1870 *Report of the Chief of Engineers*. War Department, Office of the Chief of Engineers, U.S. Army Corps of Engineers, Washington, D.C.

1884 *Report of the Chief of Engineers*. War Department, Office of the Chief of Engineers, U.S. Army Corps of Engineers, Washington, D.C.

1915 *Report of the Chief of Engineers*. War Department, Office of the Chief of Engineers, U.S. Army Corps of Engineers, Washington, D.C.

1964 *Bayou Teche, La. Maintenance Dredging Sta. 25+00 (Vic. Calumet, La.) to Sta. 199+00 (Vic. Luckland Plantation Plan and Profile.* File No. J-12-23120, U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana.

1965 *Report of the Chief of Engineers.* Department of Defense, Office of the Chief of Engineers, U.S. Army Corps of Engineers, Washington, D.C.

1989 *Water Resources Development in Louisiana 1989.* U.S. Army Corps of Engineers, Lower Mississippi Valley Division. U.S. Government Printing Office, Washington, D.C.

Van Lopik, Jack R.

1955 *Recent Geology and Geomorphic History of Central Coastal Louisiana.* Unpublished: Louisiana State University. 180 pages.

Walthall, John A.

1980 *Prehistoric Indians of the Southeast Archaeology of Alabama and the Middle South.* University of Alabama Press, University of Alabama.

Webb, Allie Bayne Windham, editor

1983 *Mistress of Evergreen Plantation: Rachel O'Connor's Legacy of Letters, 1823-1845.* State University of New York Press. Albany, New York.

Webb, Clarence H.

1968 The Extent and Content of Poverty Point Culture. American Antiquity 33(3):297-321.

Wells, Carol

1979 Extinguishing the Lights: The Teche District. *Louisiana History* 20:293-303.

Weinstein, Richard A. and Philip G. Rivet

1978 Beau Mire: A Late Tchula Period Site of the Tchefuncte Culture, Ascension Parish, Louisiana *Anthropological Report* 1. Department of Culture, Recreation and Tourism Louisiana Archaeological Survey and Antiquities Commission, Baton Rouge, Louisiana.

Wetherbee, Jean

1985 *A Second Look at White Ironstone.* Wallace-Homestead Book Company, Lombard, Illinois.

Wetmore, Elizabeth Bisland

1902 *A Candle of Understanding.* G. P. Putnam. New York.

Yount, John T.

1967 *Bottle Collector's Handbook and Pricing Guide.* Cleveland Supply, Texas.

UNPUBLISHED SOURCES

Conveyance Office Books, St. Mary Parish Court House

PERSONAL COMMUNICATIONS

Davis, Mike 1990

Guarisco, Maria, Patterson, Louisiana 1990

Miller, George 1988.

Williams, Bob, U.S. Department of Agriculture, Soil Conservation Service 1984.

APPENDIX I

SCOPE OF SERVICES

CELMN-PD-RA 31 January 1990

***REVISED**
SCOPE OF SERVICES
Historical and Archeological
Investigations of
Fort Bisland and Lower Bayou Teche,
St. Mary Parish, Louisiana

1. Introduction. These investigations are required to support two separate projects under the jurisdiction of the New Orleans District. The projects include the Bayou Teche, Louisiana navigation project and the Atchafalaya Basin, Louisiana project. The Bayou Teche project was authorized by the River and Harbor Act of 26 June 1934 and provides for a navigation channel 8 feet deep and 80 feet wide from the mouth (at Lower Atchafalaya River) to New Iberia, a 6- by 60-feet channel from New Iberia to Keystone Lock, thence to Arnaudville a 6- by 50-feet channel. The project reach under consideration in this contract is mile 0 to 5, the Lower Atchafalaya River to Wax Lake Outlet. This portion of the project has been previously dredged to project dimensions in 1941 and 1964. The next scheduled maintenance dredging is planned for the summer of 1990.

The other Corps project represented in this study is the Atchafalaya Basin, Louisiana project, an important floodway feature of the Mississippi River and Tributaries project. Specifically, two elements of this project constructed in the 1940's are involved. These are the Wax Lake Outlet and W-112 levee item. Both projects have apparently caused adverse effects to the Bisland Battlefield as discussed in the 1988 report entitled The Battle of Fort Bisland: Historical Research and Development of an Archeological Research Design. No immediate project construction is planned for this project. However, the erosion of the Wax Lake Outlet's banks is an on-going problem with potential adverse effects on the physical remains of the battlefield.

2. Study Area. The study area consists of the construction rights-of-way as shown on the attached maps and listed below:

a. Bayou Teche, Mile 0 to 5, bank to bank (Attachment 1);

b. Proposed maintenance dredging disposal areas on both banks of Bayou Teche, Mile 0 to 5 (Attachment 1); and

c. Portion of the levee right-of-way for WABPL Item W-112 identified as the location of battlefield features (Attachment 2).

* Revisions are shown in italics.

3. **Background Information.** The proposed investigations are a mix of several investigative approaches and methodologies. The resources expected to exist in the study area include the Bisland Battlefield, a full range of historic sites along Bayou Teche, and sunken historic vessels in Bayou Teche.

First, the study is a partial implementation of the research design proposed in the final report entitled The Battle of Fort Bisland: Historical Research and Development of an Archeological Research Design. Several hypothesized battlefield features are located in the W-112 levee right-of-way and could be adversely affected by on-going erosion. Additionally, other features are expected to exist in the western disposal areas planned for the upcoming maintenance of Bayou Teche. Finally, several submerged resources related to the Civil War activities at Fort Bisland may be located in Bayou Teche. These include the J.B. Cotton, Cornay's Bridge, and caissons lost or dumped in the bayou.

The scope of this study is not limited to the Civil War battle of Fort Bisland. Other historic resources, unrelated to this event, are expected to exist in the channel and disposal areas along Bayou Teche. The range of historic sites expected to exist in the project vicinity includes home sites, plantation-related sites such as sugar mills, slave/tenant house sites, and outbuildings, landings, bridge locations, etc.

Another important cultural element of the study area is the significant maritime history of Bayou Teche. The navigation history of the bayou is documented in the report entitled A History of Waterborne Commerce And Transportation Within the U.S. Army Corps of Engineers, New Orleans District and an Inventory of Known Underwater Cultural Resources prepared by Coastal Environments, Inc. This study documented 137 recorded shipwrecks in Bayou Teche, but also concluded that the historic record represents an incomplete and biased sample of the submerged resources expected to exist. Thus, additional submerged resources undoubtedly exist in the bayou.

An extremely valuable resource exists for the remote sensing investigation of the bayou. An 1870 Corps of Engineers examination of Bayou Teche performed by Capt. C.W. Howell produced a detailed map of obstructions existing at that time. Within the present study area, numerous historic vessels are recorded including the J.B. Cotton, the Flycatcher, the Muddigger, several schooners, barges, bridges, and pilings. According to the Chief of Engineers report for 1871, all obstructions below New Iberia had been removed from the navigation channel. It is not clear that this included all the cultural features identified by Capt. Howell.

4. **General Nature of the Work.** The study will consist of historical and archeological investigation of lower Bayou Teche, detailed magnetometer survey of Bayou Teche, partial implementation of the Fort Bisland research design, and data analysis and report preparation.

5. **Study Requirements.** 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 study will be conducted in five phases: Historical research of Lower Bayou Teche, Magnetometer survey of Lower Bayou Teche, Terrestrial survey of Lower Bayou Teche, Archeological investigation of the Fort Bisland Battlefield, and Data Analysis and Report Preparation.

A. Phase 1. Historical Research of Lower Bayou Teche. The study will begin with research of available literature and records necessary to establish the historic setting, predict the nature of the resource base in the project area, and refine the survey methodology. No further research into the Civil War Battle of Bisland is required. This phase will include archival research, a literature review, a brief review of the geomorphology, and research of historic maps and records including aerial photos and drawings on file at the New Orleans District. Due to the wealth of regional CRM documents covering the study area, this research will focus on the identification of historic feature locations.

A brief, interim report will be prepared at the conclusion of this phase and submitted to the Contracting Officer's Representative (COR). The report will specifically include the following:

(1) a brief description of the study area's geomorphology, prehistory, and history as they relate to the location, identification, and evaluation of cultural resources;

(2) predictive statements of the geomorphological and archeological expectations based on the background research. Included as part of the report will be a graphical prediction of historic features, both terrestrial and marine, on the project maps (attachments 1 and 2);

(3) refinements in the survey methodologies as necessitated by these predictions;

(4) discussion and listing of completed and planned GIS layers. And;

(5) identification of the two selected grid cells in the W-112 right-of-way for intensive magnetometer and metal detector survey.

The report shall be submitted within 3 weeks after delivery order award for review and approval. All review comments will be resolved or incorporated within 1 week after submittal.

B. Phase 2. Magnetometer Survey of Lower Bayou Teche. Upon approval of the Phase 1 report, the contractor shall proceed with execution of the marine magnetometer fieldwork. The equipment array required for this survey effort is:

(1) a marine magnetometer
(2) a positioning system
(3) a recording fathometer

The contractor will begin by establishing the shore reference stations for the positioning system. The following requirements apply to the survey:

(1) transect lane spacing will be no more than 100 feet,
(2) positioning control points will be obtained at least every 100 feet along transects,
(3) background noise will not exceed +/- 3 gammas,
(4) magnetic data will be recorded on 100 gamma scale,
(5) the magnetometer sensor will be towed a minimum of 2 1/2 times the length of the boat or projected in front of the survey vessel,
(6) the survey will utilize the Louisiana Coordinate System,
(7) additional, tightly-spaced, transects will be run over all potentially significant anomalies to provide a detailed magnetic location and plan map, and
(8) probing of the water bottom will be performed at all potentially significant anomalies.

C. Phase 3. Terrestrial Survey of Lower Bayou Teche. Upon approval of the Phase 1 report by the COR, the Contractor shall also initiate the terrestrial fieldwork. Standard terrestrial survey as described below, or modified by the Phase 1 report, is the required procedure. The intensive pedestrian survey will utilize lane spacing of 20 meters and a shovel/auger testing interval of 50 meters in an offset pattern. Shovel tests will be approximately 30x30 cm in the horizontal plane and approximately 25-50 cm deep, i.e. to sterile subsoil. Auger testing to depths as great as 2 meters will be performed where research indicates the presence of recent sedimentation or dredged material disposal. The excavated soil will be screened through 1/4 inch wire mesh. This systematic procedure will be supplemented with judgmental shovel/auger testing where the background research indicates high probability geomorphic features or historic sites.

All sites located in the survey corridors will be mapped, photographed, and briefly tested using shovel, auger, and limited controlled surface collection to determine depth of deposit, site boundaries, stratigraphy, condition, and cultural association. *It is estimated that two archeological sites will require the hand excavation of two or more 1 x 2 meter units to assess their National Register*

eligibility. Therefore, a total of 5 days for a three-man crew, consisting of a Field Archeologist and two Archeological Assistants, has been allotted for the site testing phase of the survey. The selection of sites for testing will be coordinated with and approved by the COR. If a balance of field time remains at the completion of this phase, it will be applied to the archeological investigation of potential features in the W-112 portion of the Bisland Battlefield (see section 5.D.(7) below). At a minimum, site maps will show site boundaries, locations of features and artifact scatters, locations of all subsurface testing units, and prominent natural and cultural features in the site area. All shovel/auger tests and excavation units will be immediately backfilled upon completion of archeological recordation.

For all sites discovered during the survey, the Contractor will file state site forms with the Louisiana State Archeologist and cite the resulting state-assigned site numbers in all draft and final reports. In addition, the Contractor will submit site update forms to the State Archeologist for all previously recorded sites. These forms will correct previously filed information where appropriate and summarize the results of the present investigation. All sites located within the project area will be recorded to scale on the appropriate 7.5 minute quadrangle and aerial mosaic project maps. The quadrangle maps will be utilized to illustrate the site forms. One copy of the aerial mosaic project maps, marked with the locations of all sites and historic structures in the project easement, and two unbound copies of each site and site update form will be submitted to the COR with the draft report.

All standing structures located in the survey area will be identified by function, dated and described in standard terminology of formal and/or vernacular architecture, as appropriate. Each structure predating 1945 or of potential National Register eligibility will be recorded on Louisiana state standing structure forms accompanied by a minimum of three black and white photographs showing front, back and side views of the structure. The Contractor will determine whether subsurface features are present. If present, the structure and features will be treated as a site and documented accordingly. The Contractor shall assess the significance, i.e. the National Register eligibility, of all standing structures. Two copies of all standing structure forms will be submitted with the draft report.

D. Phase 4. Archeological Investigation of the Fort Bisland Battlefield. Upon approval of the phase 1 report, the Contractor shall initiate the archeological study of the battlefield. The methodology to be employed is *based upon the recommendations contained* in the report entitled The Battle of Fort Bisland: Historical Research and Development of an Archeological Research Design. The specific procedures to be utilized are described below:

(1) Establish a site grid - Prior to the conduct of any archeological fieldwork, a permanent grid system will be established over the battlefield. This will include placing a permanent datum and a series of subdata as necessary.

These data will be placed in the Corps rights-of-way and their precise location will be approved by the COR prior to their placement in the field. The grid system established will be aligned to the UTM grid and will utilize a 100 meter interval. Finally, this grid system will be superimposed on existing maps of the battlefield, as well as all new maps generated by this study.

The remainder of the methodology is divided into two parts. First, the procedures to be applied in the Bayou Teche portions of the battlefield (i.e. the westernmost disposal areas) are described in sections (2) and (3) below. The methods to be employed in the W-112 levee right-of-way are discussed in sections (4) through (7) below.

BAYOU TECHE:

(2) Field Survey - The field survey is limited to the project areas identified in section 2.b. of this scope. This effectively excludes the currently cultivated portions of the battlefield, which were a primary focus of the research design. Therefore, the survey methods should be designed to fit the expected field conditions. The project areas to be studied under this contract are, for the most part, wooded and have experienced the placement of dredged material.

Due to the dredged material placement that has occurred in the study area, the field survey will begin with an attempt to quantify the amount of recent fill existing on the pre-1940 land surface. This information can then be used to modify the survey procedures to ensure efficient site discovery. The amount of filling will be estimated from inspections of the Bayou Teche bankline and from random auger tests placed away from the banklines.

The field survey will utilize 1 hectare grid units as the basic survey unit. The survey transect interval shall be 10 meters, with subsurface testing every 20 meters along the transects in an offset pattern. Shovel tests will be approximately 30x30 cm in the horizontal plane and approximately 25-50 cm deep, i.e. to sterile subsoil. Auger testing to depths as great as 2 meters will be performed where research indicates the presence of recent sedimentation or dredged material disposal. The excavated soil will be screened through 1/4 inch wire mesh.

The surface inspection shall be augmented with use of metal detectors during the initial pedestrian survey. *The metal detector survey will be performed, at a minimum, along every other survey transect.* In addition, a separate magnetometer survey will be performed along the survey transects in an attempt to locate subsurface features. All potential features identified by the survey methods will be examined with the placement of shovel/auger tests along rays at 2 meter intervals.

(3) Limited testing - Potentially significant features will be subject to limited testing to determine depth of deposit, site boundaries, stratigraphy, condition, and cultural association. This phase is limited to the minimum necessary to describe the feature and assess its National Register eligibility. The

methods to be used include additional shovel/auger testing, controlled surface collection, and the hand excavation of 1 x 2 meter units. *It is estimated that two archeological sites will require the hand excavation of two or more 1 x 2 meter units to assess their National Register eligibility. Therefore, a total of 5 days for a three-man crew, consisting of a Field Archeologist and two Archeological Assistants, has been allotted for the site testing phase of the survey. The selection of sites for testing will be coordinated with and approved by the COR. If a balance of field time remains at the completion of this phase, it will be applied to the archeological investigation of potential features in the W-112 portion of the Bisland Battlefield (see section 5.D.(7) below).*

W-112 RIGHT-OF-WAY:

(4) Investigate Depth of Dredged Material - Due to the dredged material placement that has occurred in the study area, the field survey will begin with an attempt to quantify the amount of recent fill existing on the pre-1940 land surface. This will consist of a detailed examination of the Wax Lake Outlet bankline and an extensive augering program. Approximately 51 auger tests up to 3 meters in depth will be placed at or near the 100 meter grid corners. The result of this investigation will be a dredged material contour map over the entire W-112 right-of-way.

(5) Inspection of the Wax Lake Outlet Bankline - A boat-based inspection of the bankline will be performed to determine the presence or absence of cultural remains in the present exposure. Any potentially significant remains located will be recorded and briefly investigated.

(6) Remote Sensing Survey of Two Grid Cells - This phase will consist of magnetometer and metal detector survey of two 100 meter grid cells. One of the grid cells will be selected at random while the other cell will be selected for its likelihood to contain large features of the battlefield (i.e. trenches, redoubts, etc.). The surveys will utilize 10 meter transect intervals oriented parallel to the site baseline. The graphic results of this effort will be a detailed map of metal objects located during the metal detector survey and a detailed contour map of the magnetic readings in the two selected grid cells.

(7) Archeological Investigation of Magnetic Anomalies - If site testing man-hours are available from the terrestrial survey of Bayou Teche (section 5.C. above) and the Bisland fieldwork in the western portion of the Bayou Teche disposal areas [section 5.D.(3) above], potentially significant magnetic anomalies will be investigated. The procedures will include shovel and auger tests as well as excavation of 1 x 2 meter units as necessary. The selection of anomalies for testing will be coordinated with and approved by the COR.

E. Phase 5, Data Analyses and Report Preparation. All data will be analyzed using currently acceptable scientific methodology. The Contractor shall catalog all artifacts, samples, specimens, photographs, drawings, etc., utilizing the

format currently employed by the Louisiana State Archeologist. The catalog system will include site and provenience designations.

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. The Contractor will classify each site as either eligible for inclusion in the National Register, potentially eligible, or not eligible. The Contractor shall fully support his recommendations regarding site significance. For those sites considered worthy of additional testing, the Contractor will recommend a specific testing scheme. The Contractor shall also recommend appropriate mitigation measures for all sites classified as eligible.

Based on the results of the limited investigation of the W-112 right-of-way, the Contractor shall provide a detailed analysis of present site conditions and the potential for intact remains of the Bisland Battlefield. Recommendations for additional archeological investigations shall be tailored to fit the field conditions.

The interpretation of identified magnetic anomalies will rely on expectations of the character (i.e. signature) of shipwreck magnetics derived from the available literature, and also on the correlation of magnetic anomalies with predicted historic site locations. Interpretation of anomalies will also consider probable post-depositional impacts (i.e. dredging, bridge and pipeline crossings), and the potential for natural and modern, i.e. insignificant, sources of anomalies.

For the marine magnetometer survey of Lower Bayou Teche, post-survey data analyses and report presentation will include, as a minimum:

(1) post-plots of survey transects, data points and bathymetry;

(2) same as above with magnetic data included;

(3) plan views of all potentially significant anomalies showing transects, data points, and contours;

(4) correlation of magnetic data and fathometer data, where appropriate; and

(5) correlation of anomalies and predicted historic site locations.

The report shall contain an inventory of all magnetic anomalies recorded during the magnetometer survey, with recommendations for avoidance or further identification and evaluation procedures as appropriate. These discussions must include justifications for the selection of specific targets for avoidance or further evaluation. Equipment and methodology to be employed in evaluation studies must be discussed in detail. The potential for each target or submerged historic property to contribute to archeological or historical knowledge will be assessed. Thus, the Contractor will classify each anomaly as either potentially eligible for inclusion in the National Register, or not eligible. The report will include a summary table listing all anomalies, the assessment of potential significance, and recommendations for further work.

One set of project area maps with the locations of all magnetic anomalies accurately plotted thereon will be submitted with the draft reports. In addition to the locations of all anomalies, the maps will also show other pertinent features such as: channel beacons and buoys, channel alignments, bridges, cables and pipeline crossings. The maps will be accompanied by tables listing all magnetic anomalies recorded during the survey. At a minimum, the tables will include the following information: Project Name; Survey Segment/Area; Magnetic Target Number; Gammas Intensity; Target Coordinates (Louisiana State Plane).

The analyses will be fully documented. Methodologies and assumptions employed will be explained and justified. Inferential statements and conclusions will be supported by statistics where possible. Additional requirements for the draft report are contained in Section 6 of this Scope of Services.

6. Reports-

a. Phase 1 Report. Two copies of the report on the results of the Phase 1 investigations will be submitted to the COR within 3 weeks after work item award for review and approval. This report will present in detail the proposed field methodology.

b. Draft and Final Reports (Phase 1-5). Eight copies of the draft report integrating all phases of this investigation will be submitted to the COR for review and comment within 16 weeks after delivery order award. Along with the draft reports, the Contractor shall submit:

(1) One copy of the aerial mosaic project maps, marked with the locations of all sites, standing structures, and magnetic anomalies in the project easement;

(2) two unbound copies of each site, site update, and standing structure form;

(3) three copies of the National Register Registration Forms for each site recommended as eligible for inclusion in the National Register. This documentation will contain all of the data required by NPS National Register Bulletin 16: Guidelines for Completing National Register of Historic Places Forms.

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.

The COR will provide all review comments to the Contractor within 6 weeks after receipt of the draft reports (22 weeks after work item award). 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 4 weeks (26 weeks after work item award). 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 30 weeks after work item award. The Contractor will also provide computer disk(s) of the text of the final report in Microsoft Word or ASCII format, and copies of all CAD or GIS files generated by this study.

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. 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. Attachments-

(1) Bayou Teche, Maintenance Dredging, B/L Sta. 4+00 to B/L Sta. 264+00, Plan and Profile, 2 drawings.

(2) West Atchafalaya Basin Protection Levee, Station 5740 to 5780, Right-of Entry for Cultural Resources Investigations, Station 5763+85.75 to Station 5821+80, 1 drawing.

(3) Survey of the Bayou Teche, May 1870, prepared under supervision of Capt. C.W. Howell, 3 plates.

(4) Recorded Shipwrecks on Bayou Teche from database prepared by Coastal Environments for report entitled A History of Waterborne Commerce And Transportation Within the U.S. Army Corps of Engineers, New Orleans District and an Inventory of Known Underwater Cultural Resources, 137 records with key.