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Exhibit HH.
CSX Almonaster Site
Phase I Cultural Resources Assessment Report

LOUISIANA ECONOMIC DEVELOPMENT CERTIFIED SITE

GREATER NEW ORLEANS INC
REGIONAL ECONOMIC DEVELOPMENT

DRAFT REPORT

CSX Almonaster Site Phase I Cultural Resources Assessment Report

AUGUST 2022

PHASE I CULTURAL RESOURCES SURVEY OF A 31 HA (76.3 AC) PARCEL ALONG ALMONASTER AVENUE IN NEW ORLEANS, LOUISIANA

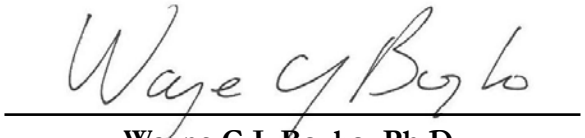
PREPARED FOR:

ARCADIS OF MICHIGAN LLC
28550 CABOT DRIVE, SUITE 500
NOVI, MI 48377

Sensitive Information: Not For Public Distribution

R. CHRISTOPHER GOODWIN & ASSOCIATES, INC.
309 JEFFERSON HIGHWAY ▪ NEW ORLEANS, LA 70121

Phase I Cultural Resources Survey of a 31 ha (76.3 ac) Parcel along Almonaster Avenue in New Orleans, Louisiana



Wayne C.J. Boyko, Ph.D.
Principal Investigator

Draft Report

By

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August 2022

For

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Abstract

R. Christopher Goodwin & Associates, Inc. conducted a Phase I cultural Resource Survey of a 31 ha (76.3 ac) parcel along Almonaster Avenue in New Orleans, Louisiana during June of 2022. Extensive pedestrian survey as well as the excavation of 228 shovel tests and 4 auger tests produced no evidence of the presence of cultural resources (i.e., archeological sites, prehistoric or historic districts, objects, or cemeteries), or standing structures within the proposed Project Area of Potential Effects. All work was performed in accordance with applicable federal guidance, including the Secretary of the Interior's "Standards and Guidelines" (48 CFR 44716-42); the Advisory Council on Historic Preservation's handbook entitled Treatment of Archeological Properties; procedures outlined in the National Historic Preservation Act of 1966, as amended, and its implementing regulations 36 CFR Part 800, entitled "protection of Historic Properties"; the Archaeological and Historic Preservation Act of 1974. Additionally, this survey abided by applicable administrative rules and guidelines pertaining to historic preservation published by the Louisiana Division of Archaeology, Louisiana Office of Cultural Development, Louisiana Department of Culture, Recreation and Tourism. RCG&A recommends that work be allowed to continue without further cultural resource investigations within the proposed Project tract.

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Chapter I
Introduction

This report describes the results of Phase I Terrestrial Cultural Resources Survey within a 40 ha (76.3 ac) tract of land along Almonaster Ave (Figures 1.1 and 1.2). This work was completed by R. Christopher Goodwin & Associates, Inc. (RCG&A) in June of 2022. All work for this project was performed in accordance with applicable federal guidance, including the Secretary of the Interior's "Standards and Guidelines" (48 CFR 44716-42); the Advisory Council on Historic Preservation's handbook entitled Treatment of Archeological Properties; procedures outlined in the National Historic Preservation Act of 1966, as amended, and its implementing regulations 36 CFR Part 800, entitled "protection of Historic Properties"; the Archaeological and Historic Preservation Act of 1974. Additionally, this survey abided by applicable administrative rules and guidelines pertaining to historic preservation published by the Louisiana Division of Archaeology, Louisiana Office of Cultural Development, Louisiana Department of Culture, Recreation and Tourism.

Project Description

The Phase I Cultural Resources Survey was conducted to support the Louisiana Economic Development (LED) Site Certification process. The LED Certified Site Application requires certified sites must be cleared for development by the Louisiana State Historic Preservation Officer (LA SHPO) to verify there are no historic or prehistoric archeological sites that will be destroyed by an industrial development. Specific development plans for this tract have not yet been developed.

Area of Potential Effects (APE) and Scope of Work

The project area is located in New Orleans East along Almonaster Avenue north of the Mississippi River – Gulf Outlet (MR-GO). The proposed Project area is an undeveloped tract situated in a non-urban area that has been repeatedly impacted by storm and other weather events. Overall, the proposed Project area was characterized as possessing a low probability for containing cultural resources; it was not investigated using the standards the LA SHPO has promulgated for urban archeological investigations. Shovel test and auger were placed at 50-meter (m) (164-foot [ft]) or closer intervals along transects spaced 50 m (164 ft) or closer apart.

This cultural resources investigation included background research on the project area and within a 1.6 kilometer (km) (1.0 mile [mi]) buffer around it, archeological survey fieldwork, data analysis, reporting, and the curation of all records and associated documents once the final report has been accepted.

Curation

Following the completion and acceptance of the final report, all records, photographs, and field notes will be curated with the State of Louisiana, Department of Culture, Recreation & Tourism, Office of Cultural Development, Division of Archeology.

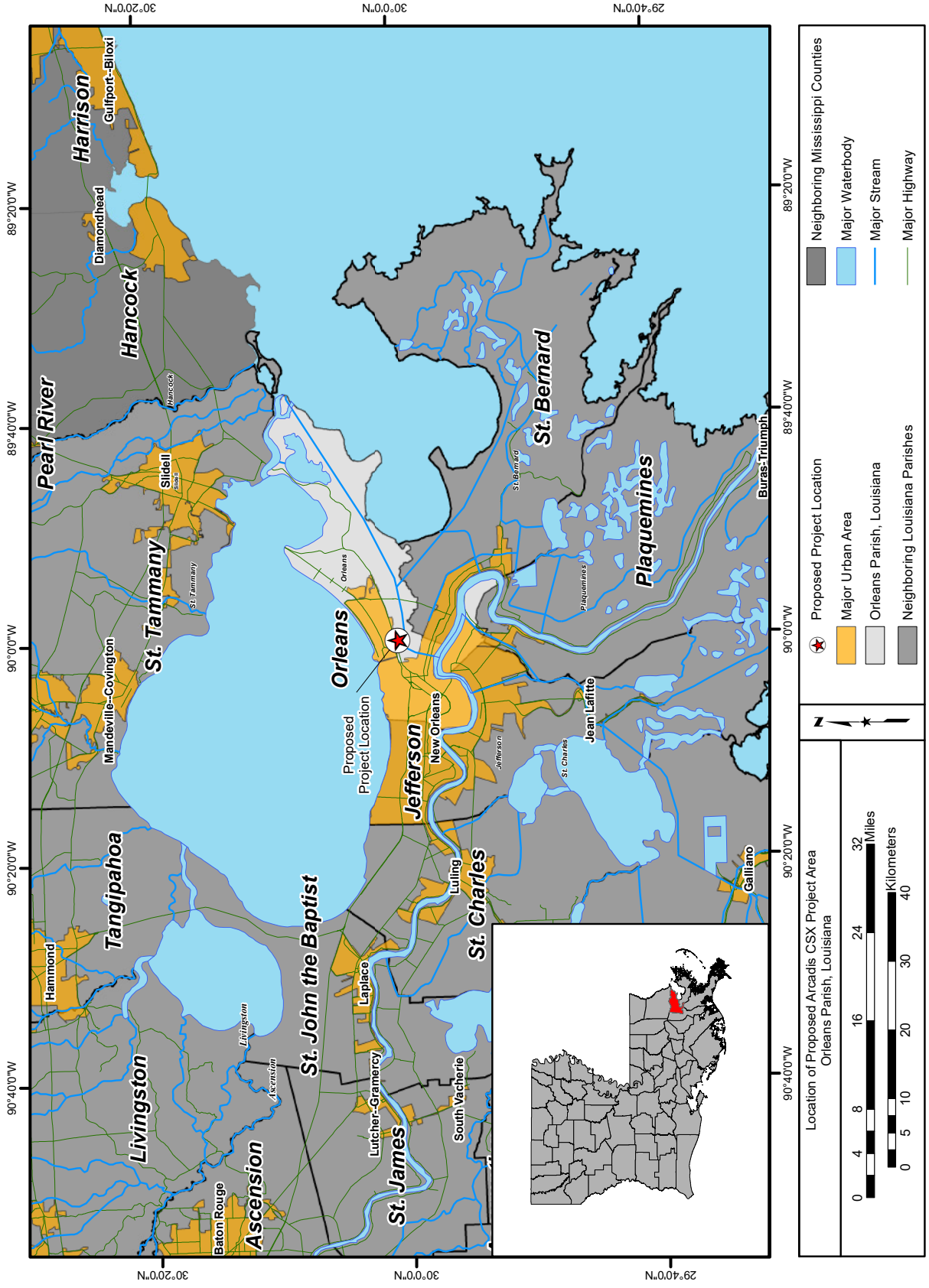

Figure 1.1 Locator map for the Arcadis CSX project area within Orleans Parish, Louisiana.

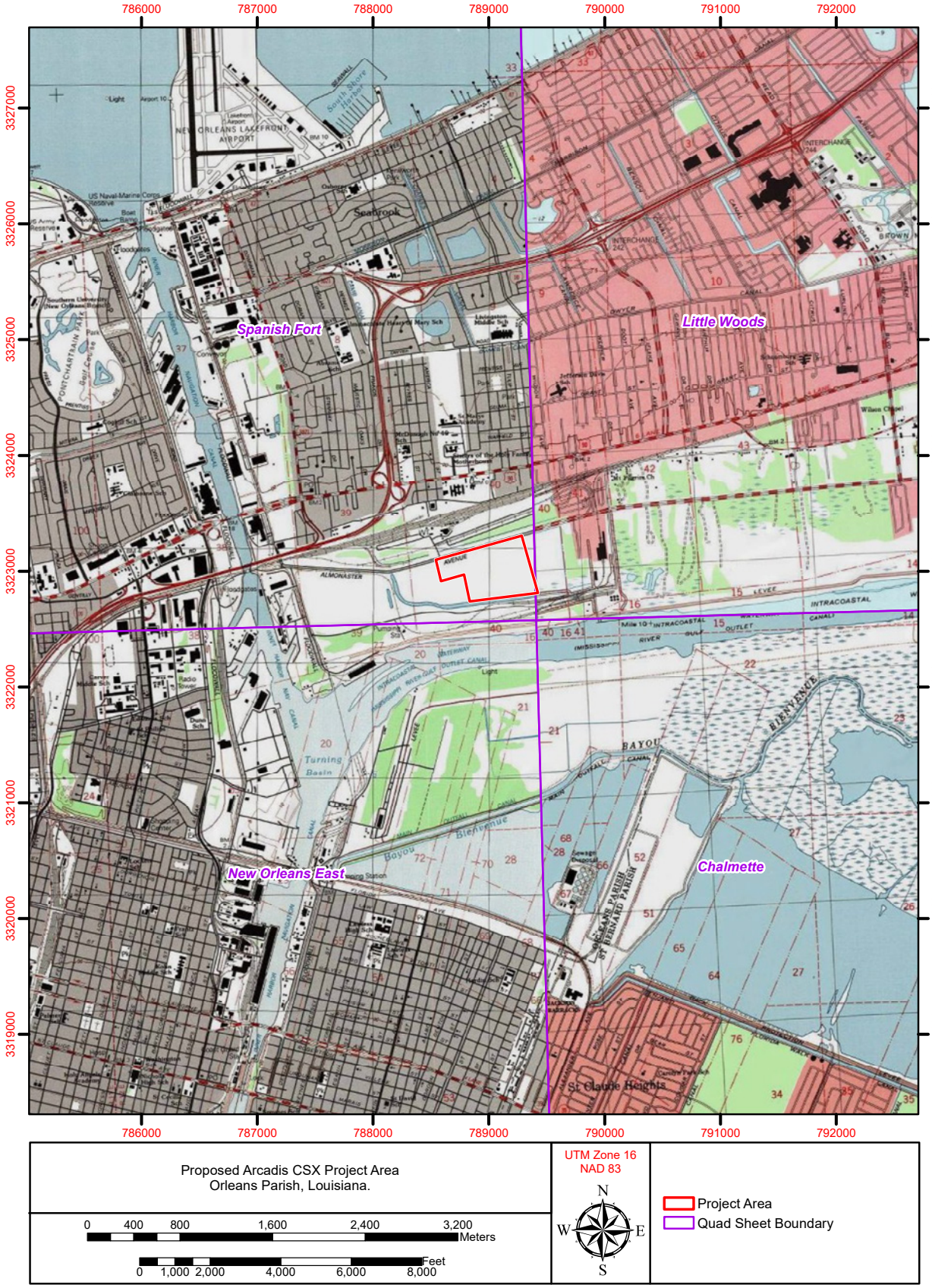

Figure 1.2 USGS Quad Map showing the Arcadis CSX Project area.

Project Personnel

Dr. Wayne C.J. Boyko, R.P.A., served as the Principal Investigator for this project. Dr. Scott Kirk, R.P.A., acted as Project Manager. This report was written by Drs. Kirk and Boyko with a contribution by Ms. Susan Barrett Smith, B.A. Field crew for this project included Dr. Kirk as project lead, in addition to Ms. Leslie Clements, B.A., Mr. Christopher Alfonso, B.A., Ms. Olivia Russell, M.A., R.P.A., and Ms. Jordan Pendel, B.A. Mr. Tyler Leben, B.A., and Ms. Carys Caffarel, M.A. acted as GIS specialists and produced the graphics for this report. Ms. Heidi Post, B.A., produced this report.

Summary of the Results of the Investigations

This Phase I Cultural Resources Survey did not identify any archeological sites, prehistoric or historic districts, objects, cemeteries or above ground built resources within the direct or indirect Area of Potential Effect (APE). No further cultural resource investigations within this tract appear warranted and none are recommended for this this Project.

Organization of the Report

The natural setting and historical context of the Project area are discussed in Chapter II. Chapter III reviews previously recorded archeological sites, standing structures and cemeteries as well as previously completed cultural resources surveys conducted in the vicinity of the proposed Project area. Methodologies used during the completion of this project are discussed in Chapter IV. The results of the completed investigation, a summary of the findings, and recommendations are provided in Chapter V.

Chapter II
Environmental and Historical Settings

Natural Settings

The proposed Arcadis CSX Project area (Project) is located in New Orleans, Orleans Parish, Louisiana. More specifically, the proposed Project is situated in New Orleans East, east of the Inner Harbor Navigation Canal and North of the Gulf Intracoastal Waterway along Almonaster Avenue. This area was not particularly developed until the 1950s, and suffered severe impacts from Hurricane Katrina. This chapter focuses on the natural and historical forces that played a role in the development of the area. The intent of this discussion is to examine the role of the natural environment and the settlement patterns of the region.

Geology and Geomorphology

New Orleans is situated within a portion of the West Gulf Coastal Plain physiographic province known as the Mississippi Deltaic Plain. This deltaic plain is a composite geomorphic surface that consists of a series of coalesced delta complexes. The surface of each of these complexes exhibits an extensive network of distributaries that radiate largely gulfward. The five delta complexes that comprise the modern Mississippi Deltaic Plain are the (1) Maringouin, (2) Teche, (3) St. Bernard, (4) Lafourche, and (5) Plaquemines delta complexes. Each of these represent a major delta-building event that has occurred at a frequency of one every 1,000 to 2,000 years. These delta complexes either lie on the surface of the former glacial coastal plain of prehistoric Louisiana or on older delta complexes constructed when sea level was lower during the Pleistocene and Early Holocene (Coleman et al. 1998; Roberts 1997).

Each delta complex consists of individual delta lobes. Delta lobes are composed of smaller deltaic plains built by one of a number of major distributaries branching from the single Mississippi River course that fed the delta complex. Like with delta complexes, the amount of water and sediment that a delta lobe received from the Mississippi River varied greatly throughout the life of the complex. Thus, within the life of a delta complex, the times at which the different delta lobes comprising it were active varied considerably (Frazier 1967).

Soil Series Map Units Identified within the Proposed Arcadis CSX Project Area

Soils within the Project area are classified on a general soils map by units that have distinctive patterns of drainage, relief, and soil composition (Figure 2.1). Soil series map units are based on the perceived relationships that exist between the soils and identified hydrologic conditions that might affect the land use associated with each particular unit. Current National Resource Conservation Service (NRCS) data place a single soil series within the Project area (USDA 2022). This soil type is described below.

Sk – Schriever Clay, 0 to 1 percent slopes, rarely flooded

Schriever clay is typically found at elevations of 0 to 6.1 m (0 to 20.0 ft) above mean sea level (amsl). It is classified as prime farmland. A typical soil profile for Schriever clay consists of three strata:

- *Ap* - 0 to 8 inches: clay
- *Bssg1* - 8 to 39 inches: clay
- *Bssg2* - *3*9 to 80 inches: clay

These soils are poorly drained and nonsaline to very slightly saline. They rarely flood and never

Figure 2.1 Soils map for the Arcadis CSX project area.

pond. Schriever clay is part of the Delta Plain – Poorly Drained Backswamp ecological area.

Climate

Orleans Parish has a humid, subtropical climate that is typical of the Mississippi deltaic plain bordering the Gulf of Mexico. Being so close to the Gulf of Mexico, the Project area is dominated by subtropical humid air masses that originate from it. Only periodically do drier continental air masses from the north and west influence the weather of the Project area. Both the air masses from the Gulf of Mexico and the extensive wetlands moderate the climate of the study area (Grymes 2000).

During the summer, temperatures can be hot. From June to early September, the daytime maximum temperatures average 32˚C (90˚F) or above. Although they do not occur in every year, temperatures above 38˚C (100˚F) do occur for two or more days in a row. According to data recorded for the period 1955 to 1977 in New Orleans, Louisiana, July is the warmest month of the year with an average daily maximum temperature of 90.4˚F (32.4˚C) and an average daily minimum temperature of 73.1˚F (22.8˚C) (Grymes 2000; Trahan 1989).

Because of the moderating aspects of the Gulf of Mexico and extensive wetlands, the winter temperatures within the region of the Project area typically are very mild. The average monthly minimum temperatures for the winter months are all above freezing. According to data recorded for the period 1955 to 1977 at New Orleans, Louisiana, January is the coolest month of the year with average daily maximum temperature of 61.5˚F (16.4˚C) and average daily minimum temperature of 42.6˚F (5.9˚C). Very short periods of sub-freezing weather associated with Arctic air masses, however, can occur. Still, single-digit temperatures are rare (Grymes 2000).

Flora and Fauna

Swamp or seasonally inundated regions and levee environments, such as those within the Arcadis CSX Project area, constitute highly productive environments with significant habitats for a diverse range of fauna and flora. Prior to being cleared, the land surrounding the Project area originally supported a mixed, deciduous hardwood forest assemblage most likely consisting of several species of oak (*Quercus* sp.), bitter pecan (*Carya illinoensis*), red maple (*Acer rubrum*), and green ash (*Fraxinus pennsylvanica*) with an understory of dwarf palmetto (*Sabal minor*). These areas were cleared for sugarcane agriculture during the eighteenth and nineteenth centuries.

A variety of mammals, birds, reptiles, amphibians, and fish are found in and around the Project area. Game mammals – of interest to both the historic and prehistoric inhabitants of the land – include white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), eastern cottontail (*Sylvilagus floridanus*), and swamp rabbit (*Sylvilagus aquaticus*). Predator mammals – some of which were only known to have inhabited the area prior to the mid-twentieth century – include black bear (*Ursus americanus*), red fox (*Vulpes fulva*), gray fox (*Urcyon cinereoargentus*), racoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), mink (*Mustela vison*), bobcat (*Felis rufus*), eastern panther (*Felis concolor*), and red wolf (*Canis rufus*). These predatory mammals, in addition to various species of raptor, have been important in limiting the size of rabbit, mouse, squirrel, and other bird populations. The mink, racoon, beaver (*Castor canadensis*), and opossum (*Didelphis virginiana*) were important fur bearers.

The aquatic environments of the Mississippi River and its bottomlands are rich in varied aquatic and semi-aquatic fauna. The Lower Mississippi River Valley is occupied by over 85 species of fish including white bass (*Morone chrysops*), yellow bass (*Morone mississippiensis*), carp (*Cyprinus carpio*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodistis olivaris*), white crappie (*Pomoxis annularis*), freshwater drum (*Aplodinotus grunniens*), garfish (*Lepisosteus* sp.), sauger (*Stizostedion canadensis*), shad (*Dorosoma* sp.), and sucker (various genera of *Catostomidae*).

A variety of amphibians including salamanders, toads, tree frogs, and true frogs are also present in the Project area. These amphibians typically require very moist soils, temporary pools, or permanent ponds. The numerous reptiles found in the Project area and vicinity include the Amer-

ican alligator (*Alligator mississippiensis*), and a number of iguanids, skinks, lizards, snakes, and turtles. Like the amphibians, most of the reptiles prefer moist or aquatic habitats. Finally, over a hundred species of birds are permanent, seasonal, or transient residents of the Project area. These include major game birds such as the wood duck (*Aix sponsa*), and wild turkey (*Meleagris gallopavo*) (Lowery 1974a, 1974b).

Prehistoric Overview

The prehistory of the Project study area extends from ca. 12,000 B.C. to A.D. 1700, and is divided into four general archeological stages. These four stages (Paleoindian, Archaic, Woodland, and Mississippian) represent developmental segments characterized by dominant patterns of subsistence, social organization, and technology (Bense 1994; Krieger 1953; Willey and Phillips 2001). Each stage can be divided into chronologically defined periods, often associated with cultures or phases that are defined based on similarities in artifact types and culture traits common to a particular geographic region (e.g., Walthall 1980; Willey and Phillips 2001:22-24).

The Paleoindian Stage (ca. >12,000 - 7,500 B.C.)

The Paleoindian stage represents the earliest inhabitants of the New World, from the first migration of peoples to the Americas sometime before 12,000 B.C., to the final receding of the Wisconsin glacial sheet and the rise of modern climatic conditions at the end of the Pleistocene epoch, ca. 8,000 B.C. (Bense 1994, Rees 2010a). The Paleoindian stage is divided into four periods. The Early Paleoindian period (ca. >12,000-11,500 B.C.) includes artifact inventories found throughout North and South America that generally are characterized as "pre-Clovis" (Morrow et al. 2012; Waguespack 2007). To date, no Early Paleoindian sites have been identified in Louisiana, or anywhere within the Lower Mississippi Valley, although certain areas of Louisiana do possess landforms (e.g., Tertiary Uplands, Pleistocene era aeolian deposits, and salt domes) that have the potential to contain sites dating from this period.

The Middle Paleoindian Period (ca. 11,500-11,000 B.C.) is represented by the Clovis culture, the earliest culture in the Americas that can be defined archeologically (Anderson and Sassaman 2012). Clovis sites appear to fall within a relatively narrow time span, ranging from ca. 11,500-11,000 B.C. (Fiedel 2004). Distinctive bifacially flaked fluted projectile points serve as the principal diagnostic marker for Clovis (Haynes 2002). In Louisiana, Middle Paleoindian artifacts are uncommon and usually are limited to isolated surface finds of Clovis points (Neuman 1984:66-68; Rees 2010a:51). In southeastern Louisiana, most landforms were created too recently to have been occupied during the Paleoindian stage (Saucier 1994), and any sites that may once have occurred in this area have been submerged, buried deeply under more recent alluvium, or washed away.

Near the end of the Pleistocene epoch, environmental changes contributed to the extinction of Pleistocene megafauna throughout the continent. In contrast to the preceding period, lithic tools more often were manufactured from local raw materials, indicating that subsistence strategies and settlement patterns were becoming more localized (Neuman 1984:69-70; Rees 2010a:53-54). This development heralds the onset of the Late Paleoindian period (ca. 11,000-7,500 B.C.) (Anderson 2004). Of particular importance for this region was San Patrice, a new technological complex that developed from Clovis, which is found throughout eastern Texas and Oklahoma, Louisiana, and Mississippi, and as far north as southern Missouri (Jennings 2008; Webb et al. 1971:46). Sites associated with this complex are believed to straddle the transition from Late Paleoindian to the Early Archaic period. San Patrice is best represented by finds in the western part of the state, but it is poorly represented in coastal Louisiana, especially within the Mississippi River delta, where landforms generally are too recent for Paleoindian remains.

The Archaic Stage (ca. 7,500 – 800 B.C.)

During the Archaic Stage, Native American peoples successfully adapted to a changing climate and to shifting resource patterns (Willey and Phillips 2001). Throughout this stage, subsistence strategies became more specialized, mobility appears to have decreased, and cultural traditions became more regionally distinct (Brain

1971; Caldwell 1958; Haag 1971; Muller 1983). The increased number of sites dating from the Archaic stage suggests a population increase throughout the Southeast. Settlement patterns exhibit a broad shift toward river valleys, which probably is a reflection of changing economic patterns (Muller 1983).

The Archaic Stage traditionally is divided into three subdivisions or periods: Early Archaic (ca. 7500 – 6000 B.C.), Middle Archaic (ca. 6000 – 2000 B.C.), and Late Archaic (ca. 2000 – 800 B.C.). These periods are marked in the archeological record by changes in tool technology and other aspects of material culture (Bense 1994). Throughout the Early Archaic period, the subsistence pattern probably resembled that of the preceding Paleoindian stage (Chapman and Shea 1981; Lentz 1986; Parmalee 1962; Parmalee et al. 1976). Diagnostic Early Archaic artifacts have been recovered from various locations on Pleistocene and older landforms throughout the state. During the Middle Archaic period, the effects of continental glaciation subsided, resulting in a warmer and drier climate. Starting around 3,900 B.C., the earliest moundbuilding cultures developed in the Lower Mississippi Valley, with most of the documented early mound sites located within the modern boundaries of Louisiana (Saunders 1999, 2000, 2010; Saunders et al. 1994). Early mound sites also are documented in southeastern and south-central Louisiana. (Gagliano 1963; Vasbinder 2005; Weinstein et al. 1977). The Late Archaic period represents a time of population growth as demonstrated by an increased number of sites dating from this time period in the United States. Hallmarks of the Late Archaic period include inter-regional trade of exotic materials, the use of ceramic cooking balls, the production of steatite stone vessels, and the advent of fiber-tempered pottery. In Louisiana, most of the time span assigned to the Late Archaic period is dominated by a single culture, Poverty Point. The Poverty Point culture (c. 1700-800 B.C.) is named after the type site (16WC5), which is located in northeastern Louisiana. (Connolly 2001; Fogelman 1991; Gibson 1991, 2000; Kidder 1991; Lehmann 1991). For southeastern Louisiana, and extending into coastal Mississippi, the Bayou Jasmine and Garcia phases (Gagliano and Saucier 1963; Gagliano et al. 1975; Weinstein et al. 1977), the Claiborne phase (Blitz and Mann 2000:19-22, 97-98), and the Claiborne Community (Gibson 2000:258-264) represent local manifestations of the Poverty Point culture (Bruseth 1991; Gagliano 1963; Gagliano and Saucier 1963; Gibson 2000; Neuman 1984).

The Woodland Stage (ca. 800 B.C. – A.D. 1200)

The succeeding Woodland stage (or period) is marked by the widespread presence of pottery, burial mound ceremonialism, sedentary village life, and horticulture throughout the Southeast (Anderson and Mainfort 2002:3; Griffin 1967:180). Each of these traits was rooted in one or more cultures of the Archaic stage, but the Woodland stage instead represented the era when these traits gained general acceptance and popularity across the region. Traditionally, the Woodland stage is subdivided into Early, Middle, and Late Woodland periods, each represented by one or more cultures or cultural periods. In Louisiana, the Early Woodland period is represented by the Tchefuncte culture (ca. 800-100 B.C.), the Middle Woodland period is represented by the Marksville culture, (ca. 100 B.C.-A.D. 400) and the Late Woodland period is represented by the Troyville/Baytown and Coles Creek cultures. (A.D. 400-1200).

The Tchefuncte culture represents the earliest peoples in the Lower Mississippi Valley to make extensive use of pottery vessels (Ford and Quimby 1945; Heller et al. 2013). Most of the key sites for the Tchefuncte culture consist of large midden sites in the coastal zone, especially around lakes Pontchartrain and Borgne (Heller et al. 2013; Shenkel 1984).

The Middle Woodland period was defined to encompass the rise and decline of the midwestern Hopewellian cultural horizon, which linked the inhabitants of the greater Southeast with contemporaneous Hopewell cultures in the Ohio and Illinois Valleys (Toth 1988:29-73). Cultural traits associated with the Hopewellian horizon included complex geometric earthworks, conical burial mounds, complex mortuary ritual systems, unique iconography, and long distance exchange networks, primarily for objects used in mortuary ritual (Kidder 2002; Neuman 1984;

Toth 1988). In the Lower Mississippi Valley, the Middle Woodland period is associated with the Marksville culture, named for the Marksville Site (16AV1) in Avoyelles Parish, Louisiana. Although a number of mound and non-mound sites in Louisiana have produced Marksville pottery, with the exception of the Marksville type site and the Crooks Site (16LA3), few Marksville period sites in the state have been investigated systematically. Several early and late Marksville phases have been proposed for southeastern Louisiana (Weinstein 1974; Weinstein et al. 1977), but these should be regarded as tentative until additional site excavations have been conducted.

New cultural patterns emerged by ca. A.D. 400 that mark the onset of the Late Woodland period in the Lower Mississippi Valley; these included mound ceremonialism focused on flat-topped pyramidal mounds, and adoption of new ways for decorating pottery. Because the Late Woodland period occupies the temporal position between the decline of the Hopewell cultural horizon and the rise of the Mississippian culture, there has been a tendency to characterize it as a transitional period between two climatic cultures (Bense 1994:162-163; Williams 1963). However, within the Lower Mississippi Valley, the Late Woodland period was exemplified by population growth, cultural diversity, and innovation (Anderson and Mainfort 2002; Nassaney and Cobb 1991). Cultural diversity especially is apparent during the early part of the Late Woodland period (ca. A.D. 400-700), when several archeologically distinct societies coexisted within different parts of the Lower Valley. Various chronologies developed for the region assign these societies loosely under the designations of the Troyville or Baytown cultures. The latter part of the Late Woodland period (ca. A.D. 700-1200) saw the efflorescence of the Coles Creek culture, which merged traditions indigenous to the Lower Mississippi Valley with influences from the emergent Mississippian societies of the Central Mississippi Valley, and the Weeden Island cultures of the eastern Gulf coast.

The Mississippian Stage (ca. A.D. 1200 – 1730)

The Mississippian stage marks the advent of a variety of interrelated, regional "Mississippian" cultures who shared common (or related) systems of sociopolitical, economic, and religious organization. These cultures began emerging in the American Bottom region near St. Louis as early as A.D. 750-800, and later spread to influence nearly every contemporary Southeastern society. Because these cultures emerged at different times and manifested themselves in differing ways from region to region, only certain general trends can be used to describe the Mississippian stage as a whole (Bense 1994). Mississippian peoples were organized as non-egalitarian, stratified societies, typically evolving a chiefdom level of sociopolitical organization. Mound centers developed as civic-ceremonial capitals of simple and complex chiefdoms, and served as focal points for practice of ritual related to the Southeastern Ceremonial Complex. Also called the Southern Cult, the Southeastern Ceremonial Complex was a shared belief system that emphasized themes of ancestor worship, fertility, and war. Rivalries between neighboring polities could result in war, as evidenced by the presence of fortifications at many Mississippian sites and observations of warfare by members of the de Soto expedition. Many Mississippian economies focused heavily on the cultivation of maize, beans, and squash.

In the Lower Mississippi Valley, the most prevalent Mississippian stage society is the Plaquemine culture, which emerged from the preceding Coles Creek culture by ca. A.D. 1200 (Rees 2010b). This culture derives its name from Plaquemine, Louisiana, a town situated near the type site, Medora (16WBR1), which was excavated by the Works Progress Administration (WPA) under Ed Doran in 1939-40 (Quimby 1951). Subsequent excavations have refined greatly our understanding of the Plaquemine culture. The Plaquemine culture incorporated many of the same settlement patterns, economic organization and religious practices that were established within the context of the Coles Creek culture. Plaquemine site hierarchy includes the same categories of sites as Coles Creek: multi-mound village centers, subordinate single mound villages, non-mound villages and hamlets, and resource extraction locales or seasonal camps (Brain 1989; Hally 1972; Neitzel 1965, 1983; Quimby 1951, 1957; Williams and Brain 1983).

The late Mississippian, Bayou Petre phase recognizes a great increase in the use of coarse shell tempered wares, including Moundville and Pensacola culture decorative types, particularly within St. Bernard and Plaquemines Parishes (Miller et al. 2000:343-348). The Delta Natchezan phase, which is centered in the Baton Rouge area and extends down into the Terrebonne Marsh, represents a development of the Plaquemine culture in the protohistoric period that demonstrates strong cultural ties with the Natchez peoples of the Natchez Bluffs.

Historical Overview through Cartographic Review

A study of early maps disclosed settlement along Bayou Gentilly during the eighteenth century – initially close to Bayou St. John and, later, spreading northeastward toward Lake Pontchartrain and the Rigolets (Lafon 1806; Saucier 1749; unidentified cartographer ca. 1723). Section 40, encompassing the current project area in Township 12S, Range 12E, initially was a private claim dating to the colonial period: R&R Claim No. C. 234, which was confirmed to Belisle (or Bellisle) Doriocourt and Azemia Doriocourt, widow of Jacques Dupuy (Figure 2.2). The Doriocourts proved "constant and uninterrupted possession, habitation, and cultivation of the said land by themselves and those under whom they [held]" since at least 1794 (Dickins and Forney 1860:6:699); however, descriptions of the surrounding properties in the *American State Papers* indicated that the Doriocourt land once was part of the vast Bayou Gentilly concession granted by the French government to Mathurin Dreux in March 1763 (Dickins and Forney 1860:6:669-672; Louisiana State Land Office n.d.:124; Lowrie 1834:2:278). The current research did not disclose what crops these colonial parties cultivated on the property.

Bayou Gentilly, also known as Bayou Chantilly or Sauvage, was a principal transport route into New Orleans. In fact, the immediate project vicinity essentially was water-bound, with only one main thoroughfare traversing the region: the Gentilly Road, which generally followed the right descending bank of Bayou Gentilly eastward from New Orleans to Chef Menteur Pass. During the early nineteenth century, a few defense fortifications were constructed toward the eastern end of Orleans Parish in order to protect the City from invasion by the British during the War of 1812 and, later, to protect the Rigolets Pass that connected Lake Pontchartrain to Lake Borgne and the Gulf of Mexico (Figure 2.3) (Burr 1839; Cropley et al. 2020:15-16; Gauld 1778; La Tourrette 1848, 1853; Lafon 1806).

A few maps were examined that charted the project region during the Civil War. These maps depicted major roads, railroads, and other features in the New Orleans vicinity. The principal forts surrounding the City were located well distant from the current project area; smaller defenses included a Confederate "line of artillery and infantry across Gentilly Ridge [the higher ground along both sides Bayou Gentilly] but without guns" (Casey 1983:139). After the Union capture of New Orleans in spring 1862, it was recommended that Federal troops fortify the Gentilly Road; however, no major hostilities occurred in the immediate project locale. Still, with proximity to important waterborne transport routes, as well as the Gentilly Road, it's possible that troops involved in shipping supplies to and from New Orleans or in pursuit of blockade runners and smugglers might have passed through the project vicinity (Abbot 1863; Casey 1983:137-139; Colton 1863; Holtz ca. 1864; Lindenkohl 1863).

As early as 1863, a railway had been projected eastward from New Orleans, generally following a route north of Bayou Gentilly and south of Lake Pontchartrain; however, it wasn't until the 1870s that the New Orleans & Mobile Railroad was constructed across eastern Orleans Parish. Known as the Louisville & Nashville [L & N] Railroad by 1883, this line extended eastward from New Orleans, generally following Bayou Gentilly, then skirting the shore of Lake Borgne before entering the State of Mississippi. Railway depots were established along the line, including Gentilly and Lee Stations, which were located on either side of the current project area (Figure 2.4) (Colton 1863; Colton & Co. 1882; Cropley et al. 2020:17; Goins and Caldwell 1995:37, 68-69; Mississippi River Commission 1887, 1899; Roeser 1876; U.S. Coast & Geodetic Survey 1879, 1896).

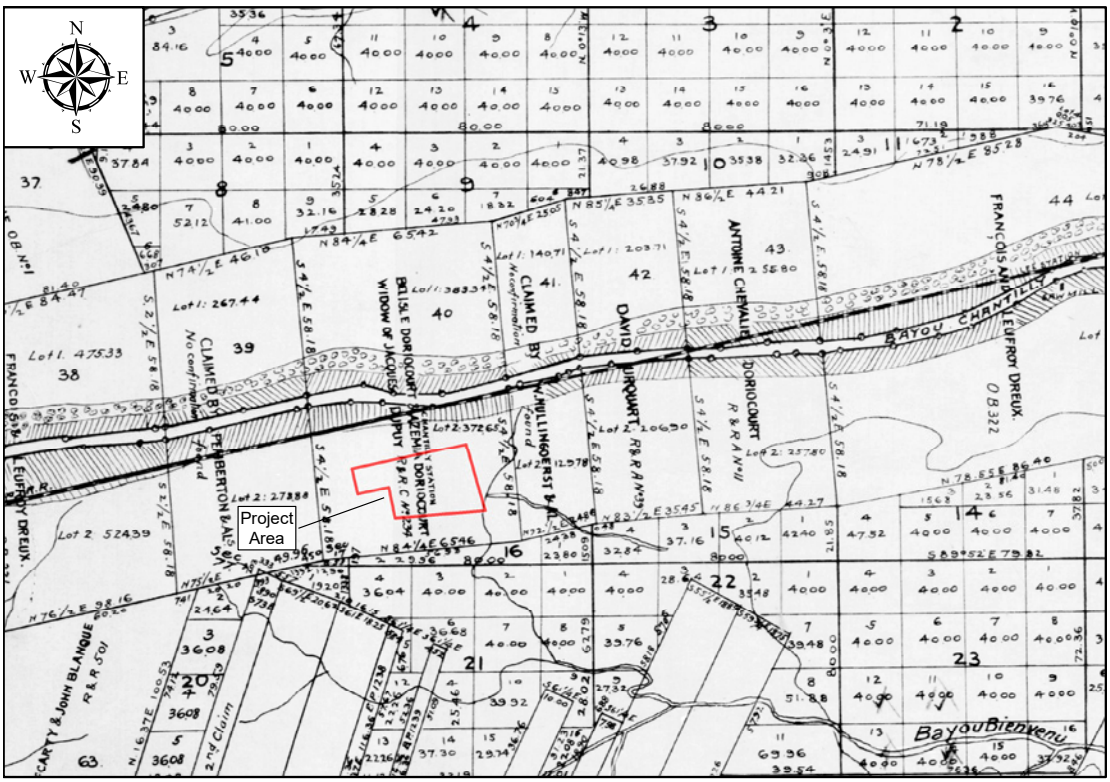

Figure 2.2 **[1873] Excerpt from the Louisiana State Land Office's official plat map of Township 12S, Range 12E, in reference to the current project area. Map excerpt depicts the Doriocourt land claim, i.e., project Section 40, as well as other claims and features in its vicinity.**

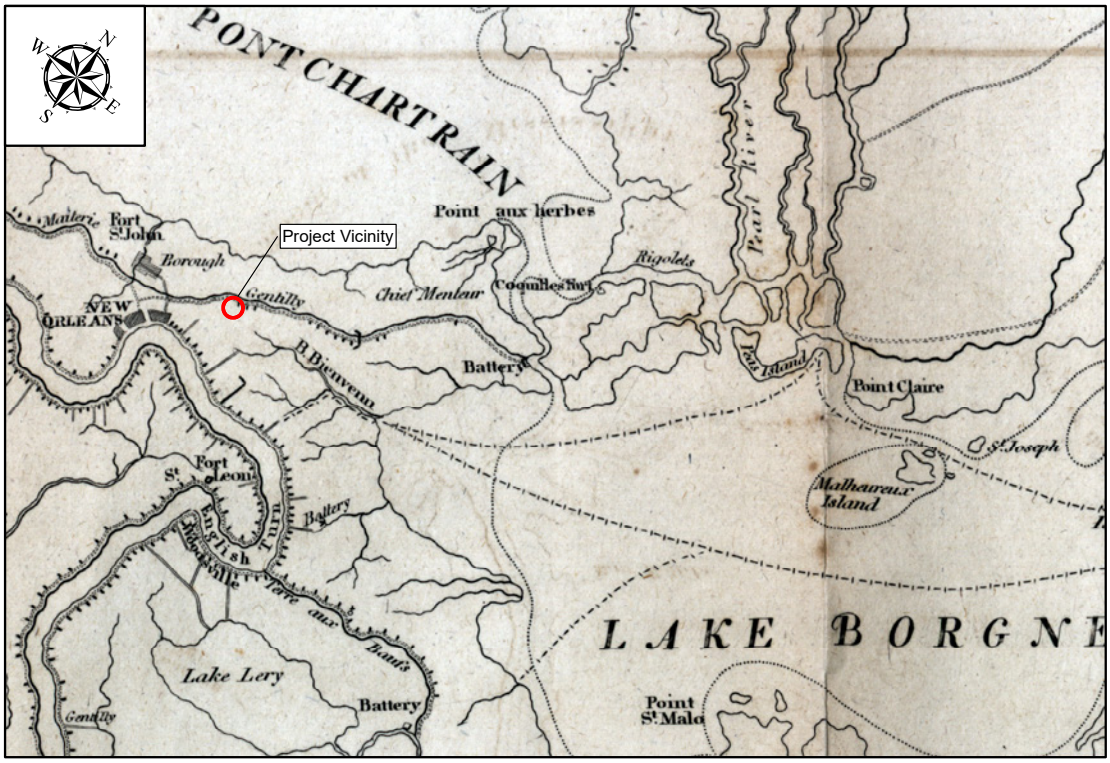

Figure 2.3 **[1816] Excerpt from Latour's *A General Map of the seat of War in Louisiana & West Florida …*, in reference to the project vicinity. Map excerpt depicts defense works in the vicinity of the City of New Orleans.**

Figure 2.4 **[1896] Excerpt from Rand, McNally & Co.'s *Louisiana*, in reference to the project area. Map excerpt depicts various features of the district, including the Louisville & Nashville Railroad (marked 17 on the map) and the historical Gentilly and Lee Stations.**

The 15' series topographic quadrangles published by the U.S. Geological Survey [USGS] during the late nineteenth century detailed little information about the project vicinity. Examination of these surveys indicated that there was scant development in the locale at that time. In fact, the maps suggested that the project acreage was located in vacant marshland below Bayou Sauvage (as it more commonly was identified by the 1890s), Gentilly Road, the L & N Railroad, and Gentilly Ridge. The sugar plantations that once thrived along the Ridge during the nineteenth century apparently had all but disappeared by the late nineteenth century, reportedly due to sinking acreage and saltwater intrusion (Hansen 1971:381; USGS 1891-1892).

Maps published during the early to mid-twentieth century depicted increased residential and industrial development in the project region, due largely to the expanded highway and rail networks. Sometime between 1925 and 1936, Chef Menteur Highway was constructed as a segment of U.S. Highway 90, extending eastward along Bayou Sauvage, generally following the old Gentilly Road (through central Section 40 and less than 700 m above the project area) and continuing beyond Chef Menteur Pass. By the mid-1930s, the L & N Railroad had established an extensive rail yard in Section 40, below the main track and encompassing the current project area. In 1923, the Inner Harbor Navigation Canal [IHNC] was opened (only a short distance west of the current project area), providing a deep-water channel between the Mississippi River and Lake Pontchartrain. By 1951, the Intracoastal Waterway had been dredged from the IHNC through eastern Orleans Parish, passing about 300 m south of the current project area. By the mid-1960s, this section of the Intracoastal Waterway had been expanded to create the Mississippi River-Gulf Outlet, commonly referenced as MR-GO, which created a shorter route

for ocean-going vessels to travel between New Orleans and the Gulf of Mexico (Cropley et al. 2020:17; Hansen 1971:330, 381; Sanborn Map Company 2022 [1937]:9:0a, [1937 updated to 1950]:9:0b; USGS 1936-1969).

The reviewed surveys dating from the late 1960s forward continued to reflect the modern development of the project vicinity. By the early 1970s, a new two-lane road had been constructed, linking industries from the IHNC through the L & N Railroad Yard to Gentilly Road and the NASA facilities to the east. Christened Almonaster Avenue, this thoroughfare bordered the northern edge of the current project area. One map (DTC 1992) depicted a facility labeled Liquid Air that was positioned in the middle of the rail yard near the northern end of the study acreage; however, no further information was found regarding this establishment. Perhaps it simply was a liquid air storage facility for use in rail facilities. Through the decades, the rail yard, today operated by CSX, and surrounding industries have continued to expand, establishing a significant industrial corridor along the once agricultural Gentilly Ridge (USGS 1972-2020).

Summary

Located in New Orleans East, the Arcadis CSX Project area can be found along Almonaster Avenue east of the Inner Harbor Navigation Canal, which was built in the 1960s. Historically this has been an underdeveloped part of New Orleans though rail ran through the area by the mid to late nineteenth century. Within the Project area, only a single soil series is recorded by the USDA, Schriver Clay. Flora and Fauna are not dissimilar to much of the rest of the southern portion of the state. As discussed in other portions of this report, much of the Project area becomes inundated after heavy rains; with waterways providing an undesirable habitat for people but one that is rich in ecological diversity.

Chapter III
Previous Investigations

A number of previous investigations, known sites, and historic structures can be found within 1.6 km (1.0 mi) of the Arcadis CSX Project area, although none intersect directly with it. The area being developed relatively recently, most of what is known about the area is from historic occupation. What follows is a brief outline of past investigations and results.

Previously Completed Cultural Resource Investigations within 1.6 km (1.0 mi) of the Arcadis CSX Project Area

Three previous cultural resource investigations have occurred within 1.6 km (1.0 mi) of the Arcadis CSX Project area (Figure 3.1; Table 3.1. Two were Phase I Cultural Resource investigations while one focused more upon architectural analysis. A brief description of each follows.

22-2267 – Klinger and Gray 1999

In 1999, Historic Preservation Associates conducted a Phase I Cultural Resources Investigation on behalf of PF.Net, LLC and the U.S. Army Corps of Engineers, New Orleans District. This work was undertaken in preparation for a proposed Fiber Optic Cable running from New Orleans, Louisiana to Pensacola, Florida. No previously recorded sites were observed within the project APE, though a large part of the report outlines nearby sites. Three new sites were identified during over the course of investigations: 16OR150, 16OR151, and 16ST191. These sites were largely characterized as surface scatters of shell and lithics. None were recommended as eligible for NRHP listing. No further investigations were recommended for this project, though archeological monitoring was suggested in the vicinity of NRHP listed properties Fort Macomb and Fort Pike.

22-2883 – Maygarden 2008

In 2006, Earth Search, Inc., conducted a reconnaissance level project designed to inventory 23 Drainage Pumping Stations (DPS) and the Carrolton Charging Station and determine their NRHP eligibility. These stations were scattered across New Orleans and the surrounding area. Six of the stations were recommended as NRHP eligible; DPS nos. 1-3, 6, 7, and 17. The report presents a summary description for each structure in the survey and justification for NRHP eligibility or ineligibility recommendations. Little contextual information is provided.

22-3140 – Tankersley et al. 2009

In July of 2008, New South Associates in conjunction with URS Corporation conducted I Phase I cultural resource investigation of 14 stockpile locations for the U.S. Army Corps of Engineers, New Orleans District. These stockpiles were for materials needed to raise and improve roughly 299.3 km (186.0 mi) of existing levees and floodwalls along Lake Pontchartrain and the West Bank. Stockpile locations cumulatively covered an area measuring 254.2 ha (628.45 ac). Investigations began by conducting a literature review and creating a predictive model to determine if stockpile locations had the potential for containing cultural resources. This analysis, in addition to field reconnaissance, lead to shovel testing at stockpile locations OP #1 and SBP #9. Three structures associated with stockpile locations OP #4, SBP #9, and SBP #24 were also evaluated. No cultural materials associated with historic or prehistoric populations were identified and the structures investigated were recommended as ineligible for NRHP listing. No other cultural resource investigations were recommended for the 14 stockpile locations.

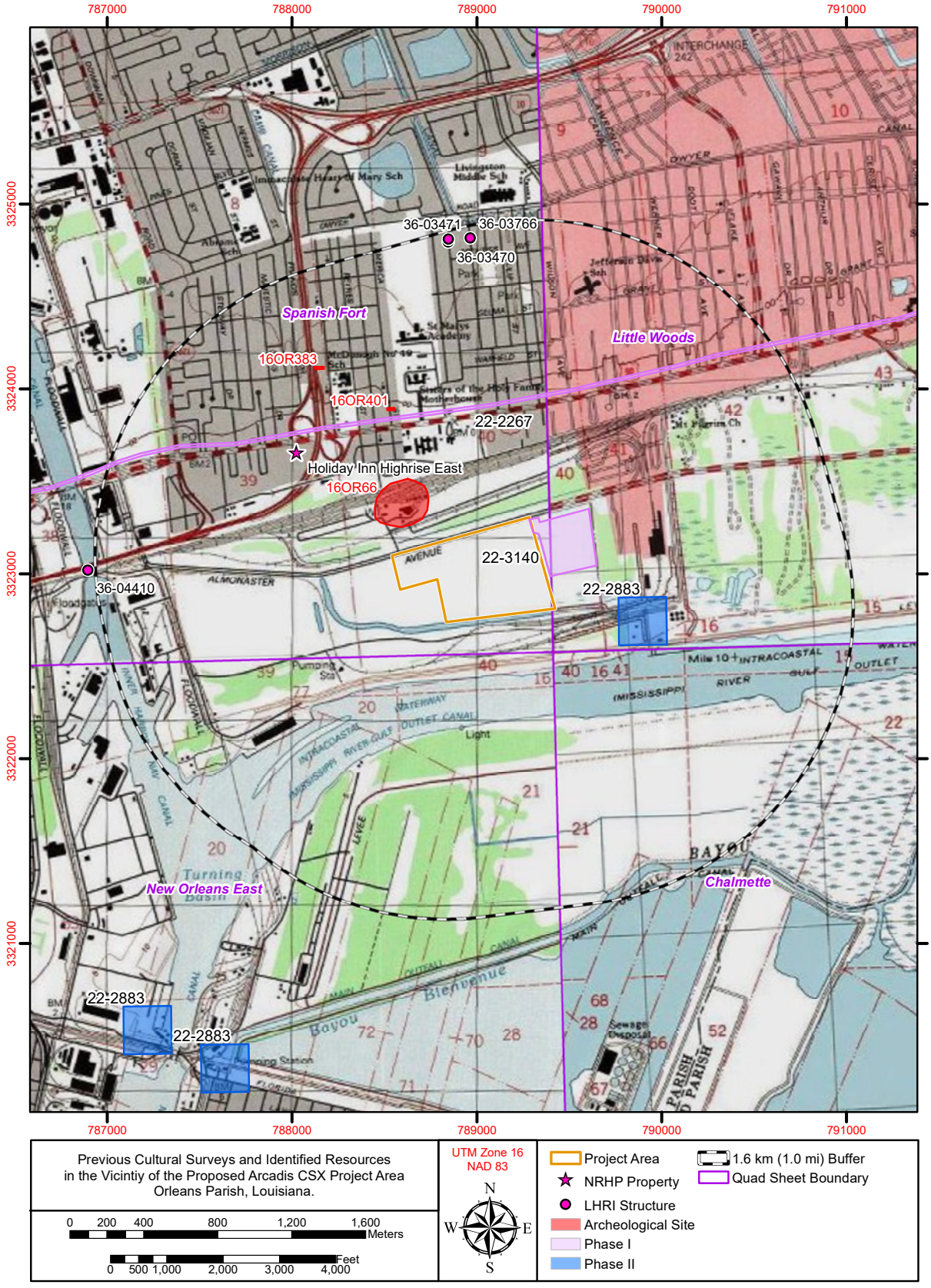

Figure 3.1 **Previous investigations, known archaeological sites, and historic standing structures within 1.6 km of the Arcadis CSX project area.**

Table 3.1 Previous Cultural Resource Investigations Completed within 1.6 km (1.0 mi) of the Arcadis CSX Project Area.

Report #	Title (Author/Date)	Sponsoring Agency	Study Type	Methods	Site(s) / Loci / Structures Identified	Recommendations
22-2267	*PF.Net, LLC New Orleans - Pensacola Louisiana Documentation* (Klinger and Gray 1999)	U.S. Army Corps of Engineers, New Orleans District	Phase I	Records Review Pedestrian Survey Shovel Testing	16OR150, 16OR151, 16ST191	No further cultural resource investigations recommended.
22-2883	*Determination of Age and Potential for National Register of Historic Places Eligibility, Orleans Parish Drainage Pumping Stations, New Orleans, Orleans Parish, Louisiana* (Maygarden 2008)	U.S. Army Corps of Engineers, New Orleans District	Reconnaisance	Architectural Analysis	DPS nos. 1, 2, 3, 4, 5, 6, 7, 10, 11,12, 13, 14, 15, 16, 17, 18, 19, 20, Carrollton Frequency Charger, Elaine, Grant, Oleander, Prichard Place, I-10 Underpass	DPS nos. 1-3, 6, 7, and 17 were NRHP eligible
22-3140	*Phase I Cultural Resource Investigation at Lake Pontchartrain & West Bank Vicinity Area Individual Environmental Report #24 Orleans and St. Bernard Parishes, Louisiana* (Tankersley 2009)	U.S. Army Corps of Engineers, New Orleans District	Phase I	Records Review Predictive Modeling Shovel Testing		No further cultural resource investigations recommended.

Previously Recorded Archeological Sites Located within 1.6 km (1.0 mi) of the Arcadis CSX Project Area

Three archeological sites are located within 1.6 km (1.0 mi) of the Arcadis CSX Project Area (Figure 3.1; Table 3.2). Two were cesspits associated with historic buildings destroyed during or immediately after Hurricane Katrina. One, Site 16OR66, was the L&N RR Switchyard. A brief description of each follows according to their Louisiana Cultural Resources Map Site Forms.

16OR66

Site 16OR66, also referred to as the L&N RR Switchyard is a historic (twentieth century) cultural locus first recorded by Coastal Environments Inc., in 1981. It is located along the south side of the L&N Railroad tracks roughly 1.7 km (1.1 mi) east of New Orleans Inner Harbor Navigational Canal. The site is comprised of brick buildings and measures roughly 300.0 x 100.0 m (984.3 x 328.1 ft). A roundhouse and turntable were known to have existed at this location but have since been destroyed. At the time of recording, a landfill was encroaching into the area and demolition or renovation of what was left was considered likely. Eligibility for NRHP was considered doubtful and no recommendations were given.

16OR383

Site 16OR383, also referred to as 4500 Ray Avenue, is a historic (twentieth century) cesspool first recorded by Sharla Azizi in 2006. It is located at 4500 Ray Avenue between Ransom and Selma Streets. The site measures approximately 13.7 x 46.7 m (44.9 x 153.2 ft) and it is comprised of a concrete slab and a partially damaged brick feature. The brick feature is thought to be what remains of a cesspool which was once associated with a demolished residence. No other cultural materials were identified during this visit. The site was recommended ineligible for NRHP, though no subsurface disturbance although was recommended without archeological monitoring.

16OR401

Site 16OR401, also referred to as 4231 America Street, is a historic (twentieth century) cesspool first recorded by Sharla Azizi in 2006. It was located at 4231 America Street between Chef Menteur Highway and Warfield Street. The site measures 10.0 x 28.6 m (32.8 x 93.8 ft) and it consisted of two concrete boxes. At least one was thought to be a concrete septic tank. No other cultural materials were identified. The site was not recommended as eligible for listing in the NRHP, though archeological monitoring was recommended if subsurface disturbance was to be carried out.

Previously Recorded Historic Built Resources Located within 1.6 km (1 mi) of the Arcadis CSX Project Area

According to the Louisiana Cultural Resources Database Map, eight historic standing structures exist within 1.6 km (1.0 mi) of the Arcadis CSX Project area (Figure 3.1; Table 3.3). Seven of these are residences, with the majority (n=6) being ranch style. The other historic structure is the Almonaster Bridge. A brief description of each according to their Louisiana Historic Resource Inventory (LHRI) forms follows.

36-03470

Located at 4933 Lafon Drive, LHRI Structure #06-03470 is a ranch style residence built around 1972. It has a gable on hip roof with a brick veneer covering the sides with a two-story addition in the rear. The structure was not recommended as NRHP eligible.

Table 3.2 Previously Recorded Archeological Sites within 1.6 km (1.0 mi) of the Arcadis CSX Project Area.

Site #	Site Name	Site Type	Affiliation	NRHP Eligibility
16OR66	L&N RR Switchyard	Historic Structure	20th century	Doubtful
16OR383	4500 Ray Avenue	Historic Cesspool	20th century	Ineligible
16OR401	4231 America Street	Historic Cesspool	20th century	Ineligible

Table 3.3 Previously Recorded Standing Structures within 1.6 km (1.0 mi) of the Arcadis CSX Project Area.

Structure #	Address	Type (Name)	Style	Construction Date	NRHP Eligibility
36-03470	4933 Lafon Drive	Residence	Ranch	1972	Ineligible
36-03471	4941 Lafon Drive	Residence	Ranch	1971	Ineligible
36-03766	4939 Camellia Street	Residence	Ranch	1945	Ineligible
36-04410	5550 Almonaster Ave	Almonaster Bridge	Movable Span Bridge	1920	Eligible
47-01797	7261 Paul Nelson Street	Residence	Ranch	1960s	Ineligible
47-01798	7164 Tip Top Street	Residence	Ranch	1962	Ineligible
47-01799	7156 Tip Top Street	Residence	Ranch/Other	1962	Ineligible
47-01800	7148 Tip Top Street	Residence	Minimal Tradition Cottage	1962	Ineligible

36-03471

Located at 4941 Lafon Drive, LHRI Structure #36-03471 is a ranch style residence built around 1971. It is a one-story masonry house with a hipped roof. It was not recommended as eligible for NRHP.

36-03766

Located at 4939 Camellia Street, LHRI Structure #36-03766 is a one-story, ranch style residence built around 1945. It is rectangular in plan and brick veneered with a hipped roof. The structure was not recommended as NRHP eligible.

36-04410

LRHI Structure #36-04410 is the Almonaster Bridge, located at 5550 Almonaster Ave. Built between 1918 and 1920, it is a movable span bridge designed for both rail and road traffic. It was considered NRHP eligible under criterion C, design and construction.

47-01797

Located at 7261 Paul Nelson Street, LHRI Structure #47-01797 is a one-story, ranch style residence built in the 1960s. It has a hipped roof and brick veneer. The structure was not recommended as NRHP eligible.

47-01798

Located at 7164 Tip Top Street, LHRI Structure #47-01798 is a one-story, ranch style residence built around 1962. Little information on this structure is provided and it was not considered NRHP eligible.

47-01799

Located at 7156 Tip Top Street, LHRI Structure # 47-01799 is a one-story, ranch style residence built around 1962. The structure had a gabled roof over one side, a pitched roof over the other, and vinyl siding. It was not considered eligible for NRHP listing.

47-01800

Located at 7148 Tip Top Street, LHRI Structure # 4701800 is a one-story, minimal tradition cottage built around 1962. The structure had a side gabled roof, vinyl siding, and was raised on concrete blocks. It was not considered NRHP eligible.

Properties Listed on the National Register of Historic Places and National Register Historic Districts Located within 1.6 km (1.0 mi) of the Arcadis CSX Project Area

A single National Register Historic Property exists within 1.6 km (1.0 mi) of the Arcadis CSX Project area.

Holiday Inn Highrise East

The Holiday Inn Highrise East was first constructed around 1968 and has undergone minimal renovations over the years. Located along Chef Menteur Highway, the building is a nine-story testament to the time in which it was built.

The structure was added to the NRHP in 2018, having been found eligible under criterion C.

Cemeteries Located within 1.6 km (1.0 mi) of the Arcadis CSX Project Area

No known cemeteries occur within 1.6 km (1.0 mi) of the Arcadis CSX Project area.

Cultural Districts

The Pine Village Cultural District is located to the North of the Arcadis CSX Project area. A Louisiana cultural district is designated by local governments as a hub of cultural activity in an effort to revitalize communities (Louisiana Department of Culture, Recreation, and Tourism 2022). This program was created in 2007.

Summary

Three other cultural resource investigations have occurred within 1.6 km (1.0 mi) of the Arcadis CSX Project area. None revealed culturally significant findings near the Project area. Outside of these investigations, three archeological sites, eight historic structures, and one NRHP listed property are known to exist within 1.6 km (1.0 mi) of the Project area. None of these would be affected by activities occurring within the Arcadis CSX Project area.

Chapter IV
Research Design and Methodology

Methodologies employed during this investigation were designed to obtain data pertaining to the nature and distribution of cultural resources located within the limits of the proposed Arcadis CSX Project area. Archeological field survey included visual inspection, pedestrian survey, systematic shovel testing, and auger testing. Field methods as well as laboratory methods and analytical procedures that would have been employed if cultural material had been collected are described below.

Archeological Survey Methods

Archeological investigations in the Arcadis CSX Project area were based on methods that provided for consistency and quality control, as well as for precisely locating any cultural resources identified during survey. Fieldwork included both surface reconnaissance throughout the entire length and width of the proposed project area and the implementation of a stratified and systematic subsurface testing regime; or at least as much as possible given commercial activities in the area. Locations of survey transects and shovel tests, changes in vegetation and topography, as well as the presence of natural and artificial features were recorded on shovel test and transect record forms. Transect survey was utilized to assure complete and thorough coverage of the proposed Project area and to control the delineation and recordation of any archeological sites or cultural loci identified during survey.

The frequency and distance between shovel tests for this project reflected the probability of uncovering cultural resources; as the entire study area was thought of as high probability due to a number of known sites in the vicinity, a majority of shovel tests were excavated at 30-m (98-ft ft) intervals along transects spaced 30 m apart. This included 375 planned shovel tests along 30 transects. Due to dense vegetation, storm debris, and difficulty traversing the landscape, 9 transects were excavated at 50-m (164-ft) intervals, with transects still spaced 30 m apart. Along these transects, shovel tests were not excavated in areas that contained standing water, or in areas characterized by excessive disturbance. In cases with a localized disturbance or where inundation was present, attempts were made to offset the shovel test. If offsets proved too far (>3 m [10 ft] from the designated shovel test location), shovel tests were not performed and pedestrian survey of the area was the only investigation that occurred.

All shovel tests measured at least 30 cm (12 in) in diameter and each was excavated to depths of at least 50 cm below surface (20 inbs), an impermeable material (such as concrete or compact clay) was uncovered, or the influx of water hampered excavation. All shovel test fill was screened through 0.64 cm (0.25 in) mesh, when possible; extremely wet soils and clays were hand-sifted, troweled, and examined visually for cultural material. Each shovel test was excavated in 10 cm (4 in) artificial levels within natural strata and fill from each level screened separately. Additionally, a row of auger tests were performed to depths of at least 1.0 m (3.3 ft) to test if cultural material was present at depths greater than those reached through shovel testing. For both shovel tests and auger tests, Munsell® Soil Color Charts were used to record soil color; soil texture and other identifiable characteristics also were recorded using standard soils nomenclature. All shovel and auger tests were backfilled immediately upon completion of the archeological recordation process.

Site Recordation and Delineation

Though no cultural resources were identified within the project area, they would have been examined to ascertain their nature, size, depth, integrity, age, and affiliation. Delineation of cultural resources would have been completed to assess

the stratigraphic placement, artifact density, and research potential. Information would have been gathered to assess whether each cultural resource was eligible for NRHP listing, applying the NRHP Criteria for Evaluation (36 CFR 60.4 [a-d]). Archeological site recordation would have included a combination of the following: (1) establishment of a site datum; (2) intensive surface reconnaissance of the site area; and, (3) the excavation of tightly spaced shovel tests at 10-m (33-ft) intervals along lines emanating from datum to delineate both the horizontal and vertical extent of the site as well as its configuration. Artifact distributions and the stratigraphic positions of all cultural material recovered would have been used to compile site descriptions to support a clear and concise statement regarding site integrity and significance for each archeological site identified. Finally, a State of Louisiana Archeological Site would have been completed for each archeological site identified.

Laboratory Methods

Laboratory analysis of recovered cultural material would have followed established archeological protocols. All field specimen bag provenience would have first been crosschecked against field notes for accuracy and completeness. Following this quality-control process, all recovered material would have been washed by hand, air-dried, sorted into basic material categories, and encoded into customized relational databases built using Microsoft Access© 2010 software. Each database would have organized recorded data into sortable fields, allowing for analysts to query specific data according to a broad range of variables. During analysis, particular care would have been taken to observe and record chronologically sensitive attributes of each artifact. While basic descriptive information would have been recorded for all items, less effort would have been expended on classes of artifacts that provide little information relevant to the research design, such as bulk historic materials (i.e., brick fragments, coal, and mortar), lithic debitage, and faunal material.

Curation

Following the completion and acceptance of the final report, all records, photographs, and field notes will be curated with the State of Louisiana, Department of Culture, Recreation & Tourism, Office of Cultural Development, Division of Archaeology and housed at the facility located at 1835 North River Road, Baton Rouge, LA 70802.

Chapter V
Results and Recommendations

R. Christopher Goodwin & Associates, Inc. (RCG&A) completed a Phase I cultural resources survey and archeological inventory of an approximately 31.0 ha (76.3 ac) parcel along Almonaster Avenue in New Orleans, Louisiana on behalf of Arcadis of Michigan LLC. Investigations occurred in June of 2022. The Project area was bounded on the north by a deep (> 3 m [10 ft]) drainage running parallel to Almonaster Avenue (Figure 5.1), on the west by Insurance Auto Auctions of New Orleans East (Figure 5.2), on the south by a drainage canal and a vacant lot used as a dumping area (Figure 5.3), and on the east by a field characterized by long grasses as opposed to the trees and secondary growth within the remainder of the Project area (Figure 5.4).

Debris and refuse were common in the area (Figure 5.4-5.6). Refuse was especially common on both sides of the drainage running along Almonaster Avenue, the western edge of the Project area, and the southern edge of the Project area, extending for a length measuring roughly 60 m (197 ft). The central portions of the Project area were devoid of much material culture (past or modern). Along the southern edge of the Project area near the drainage canal, treefall (likely from a storm) was especially dense (Figure 5.7). Vegetation within the Project area was characterized by sparse hardwoods with dense secondary growth (Figure 5.8), in some portions severely limiting visibility. Flooding after rains was common, with much of the study area becoming inundated for days after a heavy downpour (Figure 5.9).

Over the course of two weeks, field crew excavated a total of 228 of the planned 375 shovel test locations along 30 transects (Figure 5.10). These numbers reflect 21 transects (1-2 and 12-30) with shovel tests excavated at 30-m (98-ft) intervals along transects spaced 30 m apart and 9 transects (3-11) with shovel tests excavated at 50-m (164-ft) intervals along transects spaced 30 m apart. The change in sampling strategy was due to the unexpectedly dense nature of vegetation and the presence of debris from flooding and past storm events.

No shovel tests contained pre-Contact or historic cultural material. Only a few contained modern refuse (paper) at depths up to approximately 20 cmbs (8 inbs). A typical shovel test exhibited two strata in profile (Figure 5.11; also see Figure 5.12). Stratum I, dark gray (10YR 4/1) clay loam, extended from the ground surface to a depth of 10 cmbs (4 inbs). Stratum II, gray (10YR 5/1) clay, extended from the base of Stratum I to a depth of at least 50 cmbs (20 inbs). When wet, Stratum II consistency became such that it was unable to be screened. In these instances, shovel tests were troweled to determine if cultural materials were present. Additionally, many of the shovel tests could not be excavated to 50 cmbs (20 inbs) due to Stratum II's hard-packed nature limiting the ability of some crew to continue excavating and the high water table across large portions of the Project area (Figure 5.13).

In the north-central portion of the Project area stood several structures (Figures 5.14-5.18). Closest to Almonaster Ave stood a utilities hutch (Figure 5.14). This structure was well maintained and clearly in operation at the time of survey. South of this structure was a clearing with a building built into the side of a trailer which had outbuildings around it (Figure 5.15). A sign next to the entry way for this structure proclaimed that it was a "beagle club" (Figure 5.16). Whether this club was for breeding, hunting, or showing is unknown. Underneath a shaded area or carport to the left of the entry way was a tractor (Figure 5.17), presumably for maintaining the clearing and the paths which crisscrossed the Project area. Southwest

Figure 5.1 **Deep drainage running parallel to Almonaster Ave. View west.**

Figure 5.2 **Insurance Auto Auctions of New Orleans East. View from the project area west.**

Figure 5.3 **Empty lot (dump) south of the westernmost section of the project area. View southeast.**

Figure 5.4 **Northeast corner of the project area looking southeast. Border between the Arcadis CSX project area and the adjacent field. Tire dump in foreground along Almonaster Ave.**

Figure 5.5 **Concrete and construction materials in the northeastern portion of the project area. View southwest.**

Figure 5.6 **Concrete and other refuse dumped along the western edge of the project area. View east.**

Figure 5.7 **Deadfall at the end of Transect 1 near drainage canal. View south.**

Figure 5.8 **View north from transect 28 shovel test 5 illustrating how dense the vegetation was for much of the project area.**

Figure 5.9 Transect 16 view north.

Figure 5.10 **Map showing the location of all shovel and auger tests performed by RCG&A within the Arcadis CSX Project Area.**

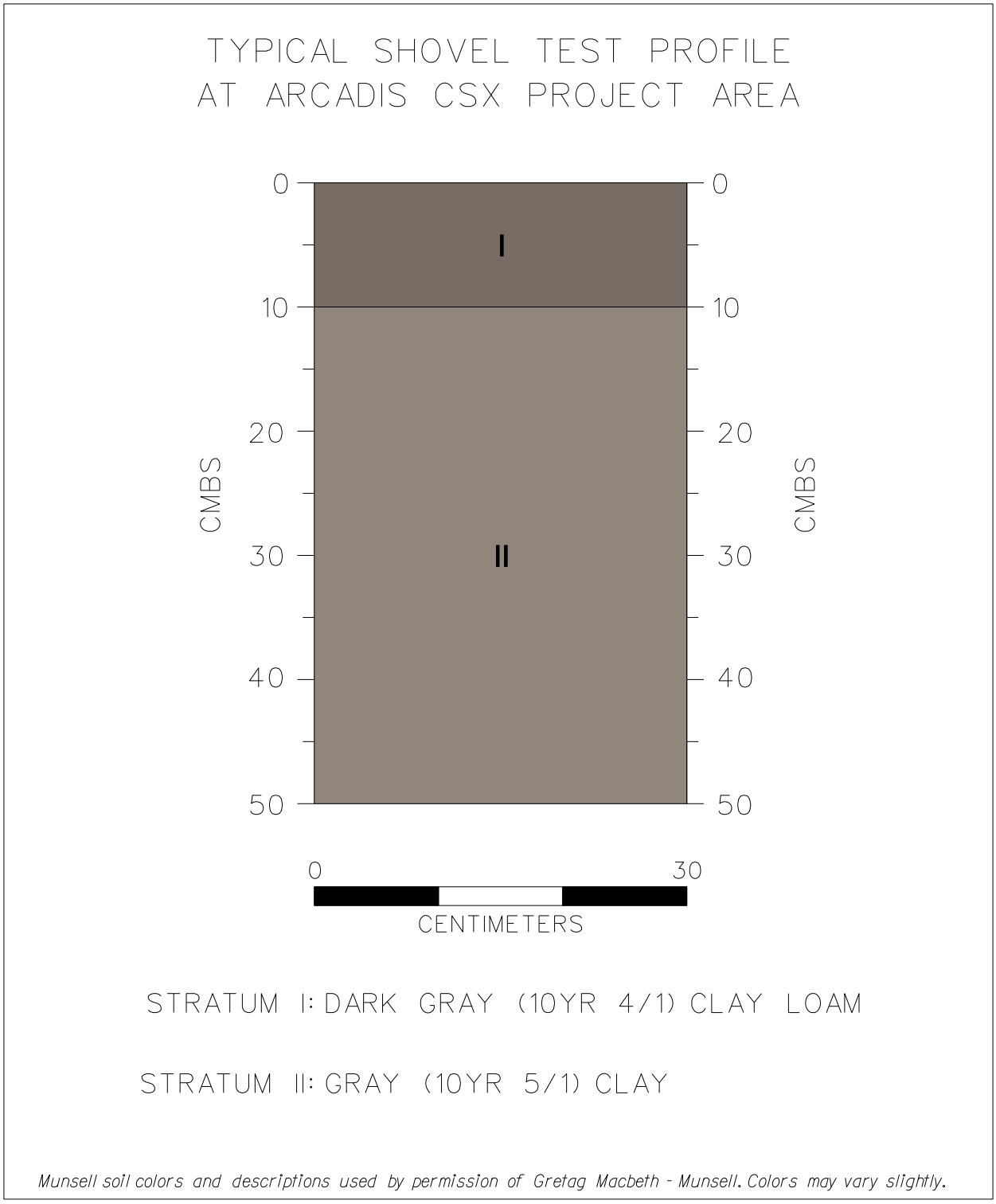

Figure 5.11 Illustration of a typical shovel test profile.

Figure 5.12 **Plan view photograph of Shovel Test 8 along Transect 11. Excavated to 45 cmbs (17.7 inbs) and terminated in hardpacked clay.**

Figure 5.13 **Planview photograph of Shovel Test 2 along Transect 11. Excavated to 25 cmbs (9.8 inbs) and terminated due to inundation.**

Figure 5.14 Utilities hutch along Almonaster Ave. View Northeast.

Figure 5.15 Clearing with beagle club structure on left and utilities hutch on right. View North.

Figure 5.16 **Picture of the entry way to the beagle club structure. View North.**

Figure 5.17 **Beagle club structure with tractor under the carport. View Northeast.**

of this structure was a number of pens built off the ground (Figure 5.18). Whether these were for beagles or creatures they were meant to hunt is unknown. South of the structure was an area cordoned off with electric fence (Figure 5.18). Initially the crew believed this to be a garden, but it could have been used for races or hunting small creatures like rabbit.

While the beagle club complex was in a state of disrepair, associated material culture suggests that abandonment was relatively recent. It is unlikely that this structure was older than 20 years and may have been abandoned after Hurricane Ida. Paper in the notice board hanging to the right of the entrance was still fairly crisp with current emergency phone numbers listed. Evidence for multiple utility connections for the beagle club complex – including water and electric – were observed, resulting in field crew not shovel testing within the clearing. Pedestrian survey was employed within this area in lieu of shovel testing and no evidence of cultural material was identified.

To ensure that cultural material was not present at depths of greater than 50 cmbs (20 inbs), four auger tests were excavated along a cleared pathway. The auger tests were spaced approximately 60 m (197 ft) apart (Figure 5.10). These were excavated to depths measuring between 93.0 and 138.0 cmbs (36.6-54.3 inbs). A typical auger test exhibited three strata in profile (Figure 5.19). Stratum I, dark gray (10YR 4/1) clay loam, extended from the ground surface to 10 cmbs (4 inbs). Stratum II, gray (10YR 5/1) clay with approximately 10% FeO_2 staining, extended from the base of Stratum I to a depth of 110 cmbs (43 inbs). Stratum III, black (10YR 2/1) silty clay, extended from the base of Stratum II to at least 138 cmbs (54.3 inbs). No cultural material was found in any of the auger tests.

Summary and Recommendations

In June of 2020, RCG&A conducted a Phase I Cultural Resource Survey within an approximately 31.0 ha (76.3 ac) parcel along Almonaster Avenue in New Orleans East, Orleans Parish, Louisiana. No cultural materials were identified within this Project area that were not modern. All man-made objects identified were refuse dating from the last 50 years, with a majority dating from within the last 10 years. All work was performed in accordance with applicable federal guidance, including the Secretary of the Interior's "Standards and Guidelines" (48 CFR 44716-42); the Advisory Council on Historic Preservation's handbook entitled Treatment of Archeological Properties; procedures outlined in the National Historic Preservation Act of 1966, as amended, and its implementing regulations 36 CFR Part 800, entitled "protection of Historic Properties"; the Archaeological and Historic Preservation Act of 1974. Additionally, this survey abided by applicable administrative rules and guidelines pertaining to historic preservation published by the Louisiana Division of Archaeology, Louisiana Office of Cultural Development, Louisiana Department of Culture, Recreation and Tourism. Additional cultural resource investigation of the proposed Project area does not appear warranted and none is recommended.

Figure 5.18 Pens in the foreground with fenced in area in background. View Southeast.

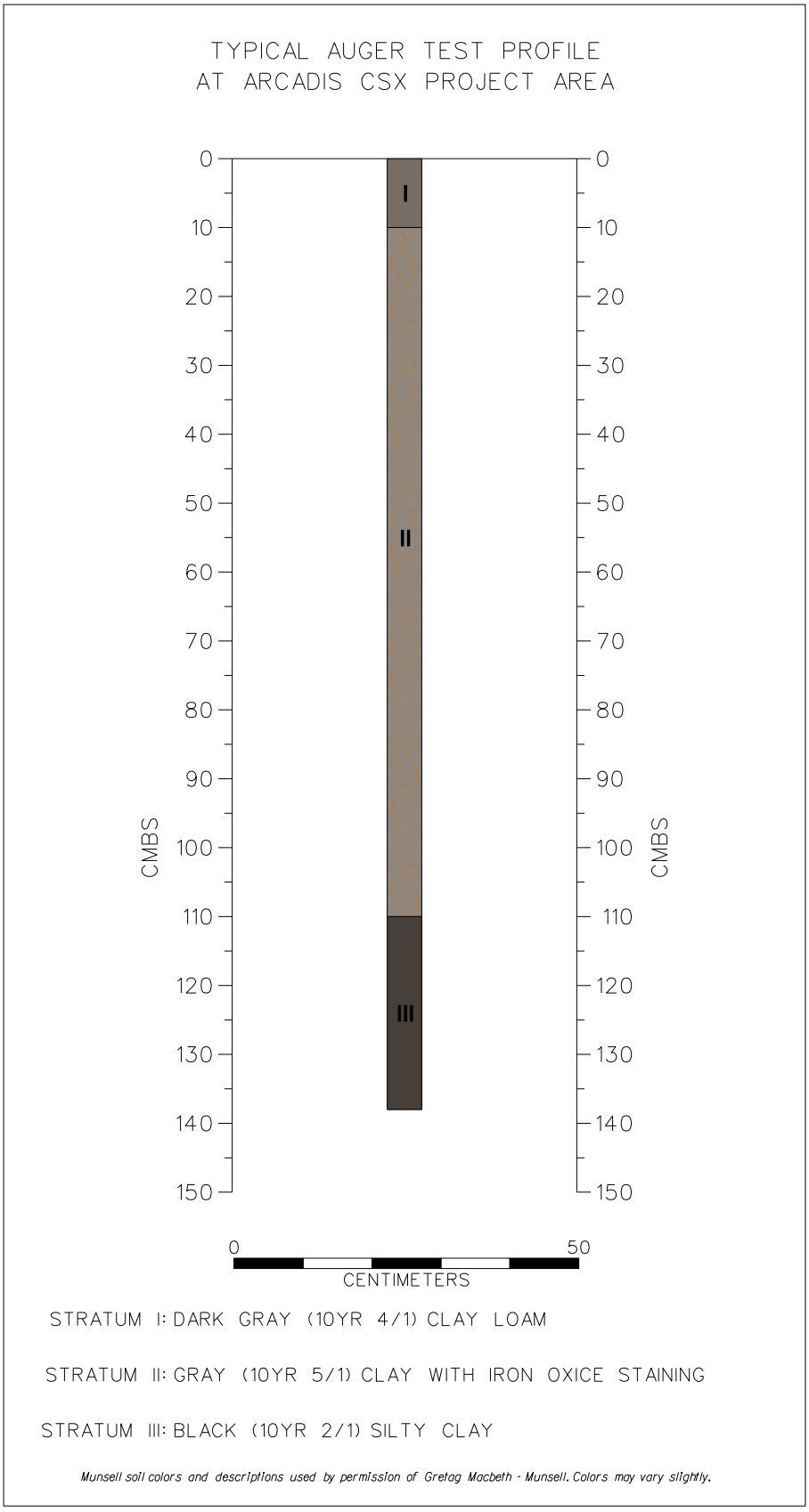

Figure 5.19 Illustration of a typical auger test profile.

References Cited

Abbot, Henry L.
1863 *Department of the Gulf, Map No. 5: Approaches to New Orleans, Prepared by order of Maj. Gen. N. P. Banks … Feb. 14th, 1863.* In *The Official Atlas of the Civil War*, Plate XC, Map No. 1. CD-ROM ed. Guild Press of Indiana, Carmel. Originally published 1891-1895, Government Printing Office, Washington, D.C.

Anderson, David G.
2004 Paleoindian Occupations in the Southeastern United States. In *New Perspectives on the First Americans*, edited by Bradley T. Lepper and Robson Bonnichsen, pp. 119-128. A Peopling of the Americas Publication, the Center for the Study of the First Americans. Texas A&M University Press, College Station.

Anderson, David G. and Robert C. Mainfort, Jr. (editors)
2002 *The Woodland Southeast*. University of Alabama Press, Tuscaloosa.

Anderson, David G., and Kenneth E. Sassaman
2012 *Recent Developments in Southeastern Archaeology: From Colonization to Complexity*. The SAA Press. Washington, D.C.

Bense, Judith A.
1994 *Archaeology of the Southeastern United States: Paleoindian to World War I*. Academic Press, San Diego.

Blitz, John H., and C. Baxter Mann, Jr.
2000 *Fisherfolk, Farmers, and Frenchmen: Archaeological Explorations on the Mississippi Gulf Coast*. Archaeological Report No. 30, Mississippi Department of Archives and History, Jackson, Mississippi.

Brain, Jeffrey P.
1971 *The Lower Mississippi Valley in North American Prehistory*. Arkansas Archaeological Survey, Fayetteville.

1989 *Winterville, Late Prehistoric Culture Contact in the Lower Mississippi Valley*. Mississippi Department of Archives and History, Archaeological Report 23.

Bruseth, James E.
1991 Poverty Point Development as Seen at the Cedarland and Claiborne Sites, Southern Mississippi. In *The Poverty Point Culture: Local Manifestations, Subsistence Practices, and Trade Networks*. pp. 7-25, edited by Kathleen M. Byrd, Geoscience & Man 29, Louisiana State University.

Burr, David H.
1839 *Map of Mississippi, Louisiana & Arkansas, Exhibiting the Post Offices, Post Roads, Canals, Rail Roads, &c.* https://www.loc.gov/item/98688404/ (27 Feb. 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (27 Feb. 2019).

Caldwell, Joseph R.
1958 *Trend and Tradition in the Prehistory of the Eastern United States*. American Anthropological Association Memoir 88, American Anthropological Association, Washington, D.C.

Casey, Powell A.
1983 *Encyclopedia of Forts, Posts, Named Camps, and Other Military Installations in Louisiana, 1700-1981.* Claitor's Publishing Division, Baton Rouge.

Chapman, J., and A. B. Shea
1981 The Archaeobotanical Record: Early Archaic Period to Contact in the Lower Little Tennessee River Valley. *Tennessee Anthropologist* 6(1):61-84

Coleman, James M., Harry H. Roberts, and G.W. Stone
1998 Mississippi River Delta: an Overview. *Journal of Coastal Research*. 14(3): 698-716.

Colton, J. H. [Joseph Hutchins]
1863 *Map of the State of Louisiana and Eastern Part of Texas.* https://www.loc.gov/item/98688488/ (27 Feb. 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (27 Feb. 2019).

Colton & Co., G. W. and C. B.
1882 *Map Showing the Routes and Connections of the Mississippi Valley Railroad of Louisiana.* https://www.loc.gov/item/98688720/ (27 Feb. 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (27 Feb. 2019).

Connolly, Robert P.
2001 *Final Report on the 1980-1982 Excavations, Northwest Ridge One, The Poverty Point Site (16WC5)*. Station Archaeology Program, Department of Geosciences, University of Louisiana, Monroe. Submitted to the National Park Service, Department of the Interior, and the Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge.

Cropley, Peter, Wayne C.J. Boyko, Nathanael Heller, and Susan Barrett Smith
2020 *Cultural Resources Investigation of the St. Catherine Island Marsh Creation and Shoreline Protection Project (PO-179) in Orleans Parish, Louisiana.* Final report submitted by R. Christopher Goodwin & Associates, Inc., to Royal Engineers & Consultants, LLC, Baton Rouge.

Dickins, Asbury, and John W. Forney (editors)
1860 *American State Papers, Class VIII, Public Lands*, vol. VI. Gales & Seaton, Washington, D.C. http://memory.loc.gov/ammem/amlaw/lwsp.html (21 Jun. 2022). Online serial set available through *American Memory: A Century of Lawmaking for a New Nation, U.S. Congressional Documents and Debates, 1774-1875*, Library of Congress, Washington, D.C. http://memory.loc.gov/ammem/amlaw/lawhome.html (21 Jun. 2022).

DTC, Incorporated
1992 Natural gas and crude & product map: Orleans Parish, Louisiana. In *Louisiana Parish Pipeline & Industrial Atlas*, p. 36. DTC [Design Technics Corporation], Houston

Fiedel, Stuart J.
2004 Clovis Age in Calendar Years: 13,500-13,000 CALYBP. In *New Perspectives on the First Americans*, edited by Bradley T. Lepper and Robson Bonnichsen, pp. 73-80. A Peopling of the Americas Publication, the Center for the Study of the First Americans. Texas A&M University Press, College Station.

Fogelman, James A.
1991 The Avoyelles-St. Landry Area of South-Central Louisiana in Poverty Point Times. In *The Poverty Point Culture: Local Manifestations, Subsistence Practices, and Trade Networks*. pp. 89-94, edited by Kathleen M. Byrd, Geoscience & Man 29, Louisiana State University.

Ford, James A., and George I. Quimby, Jr.
1945 *The Tchefuncte Culture, an Early Occupation of the Lower Mississippi Valley*. Memoirs of the Society for American Archaeology, No. 2. Menasha, Wisconsin.

Frazier, David E.
1967 Recent Deltaic Deposits of the Mississippi River: Their Development and Chronology. *Transactions of the Gulf Coast Association of Geology Societies* 17:287-315.

Gagliano, Sherwood M.
1963 A Survey of Preceramic Occupations in Portions of South Louisiana and South Mississippi. *Florida Anthropologist* 16(4):105-132.

Gagliano, Sherwood M. and Roger T. Saucier
1963 Poverty Point Sites in Southeastern Louisiana. *American Antiquity* 28:320-327.

Gagliano, Sherwood M., Richard A. Weinstein, and Eileen K. Burden
1975 *Archaeological Investigations along the Gulf Intracoastal Waterway: Coastal Louisiana Area*. Submitted by Coastal Environments, Inc. to the U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana.

Gauld, George
1778 *A Plan of the Coast of Part of West Florida & Louisiana; including the River Mississippi from its entrances as high up as the River Yazous.* https://www.loc.gov/item/2002623325/ (11 Jun. 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (11 Jun. 2019).

Gibson, Jon L
1991 Catahoula – An Amphibious Poverty Point Period Manifestation in Eastern Louisiana. In *The Poverty Point Culture: Local Manifestations, Subsistence Practices, and Trade Networks*. pp. 61-187, edited by Kathleen M. Byrd, Geoscience & Man 29, Louisiana State University.

2000 *The Ancient Mounds of Poverty Point: Place of Rings*. University of Florida Press, Gainesville.

Goins, Charles Robert, and John Michael Caldwell
1995 *Historical Atlas of Louisiana.* University of Oklahoma Press, Norman, Oklahoma.

Griffin, James B.
1967 Eastern North American Archaeology: A Summary. *Science* 156:175-191.

Grymes, John M., III
2000 Divisional Overviews of Louisiana Climate (Draft). LOSC Publication No. 00-1. Louisiana Office of State Climatology, Louisiana State University. Baton Rouge.

Haag, William J.
1971 Louisiana in North American Prehistory. *Melanges* No. 1, Museum of Geoscience, Louisiana State University, Baton Rouge.

Hally, David J.
1972 *The Plaquemine and Mississippian Occupations of the Upper Tensas Basin, Louisiana*. Unpublished Ph.D. dissertation, Department of Anthropology, Harvard University, Cambridge.

Hansen, Harry (editor)
1971 *Louisiana: A Guide to the State.* Revised ed. Hastings House, New York. Originally published 1941, Louisiana Library Commission, Baton Rouge.

Haynes, Gary
2002 *The Early Settlement of North America: The Clovis Era.* Cambridge University Press.

Heller, Nathanael, Dave Davis, Haley Holt, David Chatelain, Wayne Boyko, Charlotte Pevny, Raegan Buckley, Emily Meaden, Martha Williams, and R. Christopher Goodwin
2013 *The Tchefuncte Culture and the Early Woodland Period in Coastal Louisiana*. Report Submitted by R. Christopher Goodwin & Associates, Inc., to the Federal Emergency Management Agency (FEMA), New Orleans.

Holtz, Helmuth
ca. 1864 *Map of Louisiana & Arkansas.* https://www.loc.gov/item/99447188/ (27 Feb. 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (27 Feb. 2019).

Kindinger, Jack L., S. Jeffress Williams, Shea Penland, James G. Flocks, and Paul Conner
1997 Holocene geologic framework of lack Pontchartrain Basin and lakes of southeastern Louisiana. Gulf Coast Association of Geological Transactions 47:635-638.

Klinger, Timothy C. and John L. Gray

1999 *PF.Net, LLC. New Orleans – Pensacola Louisiana Documentation*. Prepared for the U.S. Army Corps of Engineers, New Orleans District. On file at the Louisiana Department of Culture, Recreation, and Tourism, Baton Rouge, Louisiana. Report no. 22-2267.

Louisiana Department of Culture, Recreation, and Tourism

2022 *Louisiana Cultural Districts.* Office of Cultural Development Division of the Arts. Electronic document, https://www.crt.state.la.us/cultural-development/arts/cultural-districts/, accessed 07 July 2022.

Jennings, Thomas A.

2008 *San Patrice Technology and Mobility across the Plains-Woodland Border*. Memoir 12, Oklahoma Anthropological Society. R. E. Bell Monographs in Anthropology #5, Sam Noble Oklahoma Museum of Natural History, University of Oklahoma, Norman.

Kidder, Tristram R.

1991 New Directions in Poverty Point Settlement Archaeology: An Example for Northeast Louisiana. In *The Poverty Point Culture: Local Manifestations, Subsistence Practices, and Trade Networks*, pp. 145-162. Edited by Kathleen M. Byrd, Geoscience & Man 29, Louisiana State University.

2002 Woodland Period Archaeology of the Lower Mississippi Valley. In *The Woodland Southeast*, pp. 66-90, edited by David G. Anderson and Robert C. Mainfort, Jr., The University of Alabama Press, Tuscaloosa.

Krieger, Alex D.

1953 New World Culture History: Anglo-America. In *Anthropology Today*, edited by A. L. Kroeber. University of Chicago Press, Chicago.

La Tourrette, John

1848 & 1853 *La Tourrette's Reference Map of the State of Louisiana.* https://www.loc.gov/item/2006629760/ and https://www.loc.gov/item/2006629768/, 1848 and 1853, respectively (18 Dec. 2018). Maps on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (18 Dec. 2018).

Lafon, Barthélémy

1806 *Carte Générale du Territoire d'Orléans Comprenant Aussi la Floride Occidentale et une Portion du Territoire du Mississippi.* https://www.loc.gov/item/2003623380/ (6 May 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (6 May 2019).

Latour, Major A. [Arsène] Lacarrière

1816 *A General Map of the seat of War in Louisiana & West Florida: shewing all the fortified points and encampments of both the American and British Armies* …. https://www.loc.gov/resource/g3860m.gct00236/?sp=3 (21 Apr. 2021). Plate II of *Atlas to the Historical Memoir of the War in West Florida and Louisiana* [in 1814-1815]. https://www.loc.gov/item/02017602/ (21 Apr. 2021). Atlas on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (21 Apr. 2021).

Lehmann, Geoffrey R.

1991 A Summary of Poverty Point Investigations in the Yazoo Basin, Mississippi. In *The Poverty Point Culture: Local Manifestations, Subsistence Practices, and Trade Networks*. pp. 55-60, edited by Kathleen M. Byrd, Geoscience & Man 29, Louisiana State University.

Lentz, David L.

1986 Archaeobotanical Remains from the Hester Site: The Late Paleoindian and Early Archaic Horizons. *Midcontinental Journal of Archaeology* 11(2):269-279.

Lindenkohl, H. [Henry]

1863 *Military Map of Part of Louisiana; Compiled at the U.S. Coast Survey Office.* https://www.loc.gov/item/99447190/ (27 Feb. 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (27 Feb. 2019).

Louisiana State Land Office

The following online map and land record were extracted through Louisiana State Land Office Online Documents: Historical Records. https://wwwslodms.doa.la.gov/HistoricalDocument (21 Jun. 2022). Original items on file, State Land Office, Louisiana Department of Natural Resources, Baton Rouge.

1873 Official Plat Map: Township 12S, Range 12E, South Eastern District, Louisiana, East of the Mississippi River. Surveyed 1830-1836; resurveyed 1871-1873.

n.d. U.S. Tract Books, Volume 52A, District of New Orleans, Louisiana.

Lowery, G.H.

1974a *Louisiana Birds.* Louisiana State University Press, Baton Rouge, Louisiana.

1974b *The Mammals of Louisiana and its adjacent waters.* Louisiana State University Press, Baton Rouge, Louisiana.

Lowrie, Walter (editor)

1834 *American State Papers, Class VIII, Public Lands*, vol. II. Duff Green, Washington, D.C. http://memory.loc.gov/ammem/amlaw/lwsp.html (21 Jun. 2022). Online serial set available through *American Memory: A Century of Lawmaking for a New Nation, U.S. Congressional Documents and Debates, 1774-1875*, Library of Congress, Washington, D.C. http://memory.loc.gov/ammem/amlaw/lawhome.html (21 Jun. 2022).

Maygarden, Benjamin D.
2008 *Determination of Age and Potential for National Register of Historic Places Eligibility, Orleans Parish Drainage Pumping Stations, New Orleans, Orleans Parish, Louisiana.* Prepared for the U.S. Army Corps of Engineers, New Orleans District. On file at the Louisiana Department of Culture, Recreation, and Tourism, Baton Rouge, Louisiana. Report no. 22-2883.

Miller, Cinder Griffin, R. Christopher Goodwin, Glenn Walter, T.R. Kidder, Marie Danforth, Roger T. Saucier, John Jones, William Hayden, Allen Green, Angele Montana, Nathanael Heller, Charlene Keck, Michele Williams, and William P. Athens
2000 *Phase III Data Recovery Excavations at Site 16LF66, The Discovery Site, A Site Identified within the Discovery Producer Services LLC Larose Gas Processing Plant in Lafourche Parish, Louisiana*. Submitted to the Discovery Gas Transmission LLC, St. Rose, Louisiana.

Mississippi River Commission
1887 Excerpt from [*Map of the*] *Alluvial Valley of the Mississippi River* [*from the Head of St. Francis Basin to the Gulf of Mexico, Showing Lands Subject to Overflow, Location of Levees and Trans-Alluvial Profiles*]. https://historicalcharts.noaa.gov/image=FRANBSN5bw (8 Mat 2019). Online nautical chart excerpt extracted from U.S. Office of Coast Survey, Historical Map & Chart Collection. https://historicalcharts.noaa.gov/historicals/search (8 May 2019).

1899 *Map of the Alluvial Valley of the Mississippi River from the Head of St. Francis Basin to the Gulf of Mexico, Showing Lands Subject to Overflow, Location of Levees and Trans-Alluvial Profiles.* 2nd ed. https://collections.leventhalmap.org/search/commonwealth:7h14b0450 (2 Nov. 2019). Originally published 1887. Online map courtesy of the Norman B. Leventhal Map & Education Center at the Boston Public Library.

Morrow, Juliet E., Stuart J. Fiedel, Donald L. Johnson, Marcel Kornfeld, Moye Rutledge, and W. Raymond Wood
2012 Pre-Clovis in Texas? A critical assessment of the "Buttermilk Creek Complex." *Journal of Archaeological Science* 39:3677-3682.

Muller, Jon
1983 The Southeast. In *Ancient North Americans.* Edited by Jesse D. Jennings, pp. 372-419. W.H. Freeman and Company, New York.

Nassaney, Michael S., and Charles R. Cobb (editors)
1991 *Stability, Transformation, and Variation: The Late Woodland Southeast*. Plenum Press, New York.

Neitzel, Robert S.
1965 *Archaeology of the Fatherland Site: The Grand Village of the Natchez.* Anthropological Papers Vol. 51, Pt. 1. American Museum of Natural History, New York.

1983 *The Grand Village of the Natchez Revisited*. Archaeological Report 12. Mississippi Department of Archives and History, Jackson.

Neuman, Robert W.
1984 *An Introduction to Louisiana Archaeology*. Louisiana State University Press, Baton Rouge.

Parmalee, P. W.
1962 Faunal Remains from the Stanfield-Worley Bluff Shelter. *Journal of Alabama Archaeology* 8:112-114.

Parmalee, P. W., R. B. McMillian, and F. B. King
1976 Changing Subsistence Patterns at the Rogers Shelter. In *Prehistoric Man and His Environments: A Case Study in the Ozark Highlands*, edited by W. R. Wood and R.B. McMillian, pp. 141-62. Academic Press, New York.

Quimby, George I.
1951 The Medora Site, West Baton Rouge Parish, Louisiana. *Field Museum of Natural History Anthropological Series* 24(2):80-135. Publication No. 664. Field Museum of Natural History, Chicago.

1957 The Bayou Goula Site, Iberville Parish, Louisiana. *Fieldiana: Anthropology* 47(2):89-170.

Rand, McNally & Company
1896 *Louisiana.* https://www.loc.gov/item/98688489/ (27 Feb. 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (27 Feb. 2019).

Rees, Mark A.
2010a Paleoindian and Early Archaic. In *Archaeology of Louisiana.* Edited by Mark A. Rees, pp. 34-62. Louisiana State University Press, Baton Rouge.

2010b Plaquemine and Mississippian. In *Archaeology of Louisiana.* Edited by Mark A. Rees, pp. 172-194. Louisiana State University Press, Baton Rouge.

Roberts, Harry H.
1997 Dynamic Changes of the Holocene Mississippi River Delta Plain: the Delta Cycle. *Journal of Coastal Research* 13(3):605-627.

Roeser, C. [Charles]
1876 *State of Louisiana.* https://www.loc.gov/item/2012586819/ (27 Feb. 2019). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (27 Feb. 2019).

Sanborn Map Company
2022 *Insurance Maps of New Orleans, Louisiana*: 1929-1940 series, Volume 9, 1937; and 1937-1951 series, Volume 9, 1937 updated to 1950. Online maps extracted from *Digital Sanborn Maps, 1867-1970*, owned and copyrighted by ProQuest, LLC, under license from Environmental Data Resources, Inc. Available for online research through the New Orleans Public Library, Louisiana Division, City Archives & Special Collections. http://archives.nolalibrary.org/~nopl/info/louinfo/sanbornindex/sanbornindex.htm (23 Jun. 2022).

Saucier, F.

1749 *Carte Particulière du Cours du Fleuve St. Louis depuis le Village Sauvage jusqu'au dessous du Detour aux Anglois, des Lacs Pontchartrain & Maurepas ….* https://www.loc.gov/item/2003623383/ (2 Apr. 2021). Map on file, Geography and Map Division, Library of Congress, Washington, D.C. [Online] *Map Collections*, American Memory: Historical Collections for the National Digital Library, Library of Congress. https://www.loc.gov/maps/collections/ (2 Apr. 2021).

Saucier, Roger T.

1994 Geomorphology and Quaternary Geologic History of the Lower Mississippi Valley. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Saucier, Roger T., and John I. Snead

1989 *Quaternary Geology of the Lower Mississippi River Valley*, Scale 1:1,000,000, Louisiana Geological Survey, Baton Rouge.

Saunders, Joe

1999 *1999 Annual Report for Management Unit 2*. Regional Archaeology Program, Department of Geosciences, University of Louisiana, Monroe. Submitted to the National Park Service, Department of the Interior, and the Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge.

2000 *2000 Annual Report for Management Unit 2*. Regional Archaeology Program, Department of Geosciences, University of Louisiana, Monroe. Submitted to the National Park Service, Department of the Interior, and the Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge.

2010 Middle Archaic and Watson Brake. In *Archaeology of Louisiana.* pp. 63-76, edited by Mark A. Rees. Louisiana State University Press, Baton Rouge.

Saunders, Joe, Thurman Allen, and Roger T. Saucier

1994 Four Archaic? Mound Complexes in Northeast Louisiana. *Southeastern Archaeology* 13(2):134-153.

Shenkel, J. Richard

1984 Early Woodland in Coastal Louisiana. In *Perspectives in Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 4176. Ripley P. Bulletin Monograph in Anthropology and History No. 5. Florida State University, Gainesville.

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, Office of Cultural Development, Division of Archaeology, Baton Rouge.

Tankersley, Matthew, Martin Handly, and Kristie Lockerman

2009 *Phase I Cultural Resource Investigation at Lake Pontchartrain & West Bank Vicinity Area Individual Environmental Report #24, Orleans and St. Bernard Parishes, Louisiana.* Prepared for the U.S. Army Corps of Engineers, New Orleans District. On file at the Louisiana Department of Culture, Recreation, and Tourism, Baton Rouge, Louisiana. Report no. 22-3140.

Toth, Edwin Alan

1988 *Early Marksville Phases in the Lower Mississippi Valley: A Study of Culture Contact Dynamics*. Archaeological Report No. 21. Mississippi Department of Archives and History, Jackson, Mississippi in cooperation with The Lower Mississippi Survey. Harvard University, Cambridge.

Trahan, Larry J.

1989 *Soil Survey of Orleans Parish, Louisiana.* United States Department of Agriculture, Washington D.C.

Unidentified cartographer

ca. 1723 *Carte Particuliere Du Flevue* [Fleuve] *St. Louis dix lieües au dessus De La Nouvelle Orleans … Au Mississipy.* Map on file, Edward E. Ayer Manuscript Map Collection, Newberry Library, Chicago. Online map image available through Great Lakes Digital Collection (Newberry Library). http://collections.carli.illinois.edu/cdm4/index_nby_grlakes.php?CISOROOT=/nby_grlakes (3 Jun. 2009).

U.S. Coast & Geodetic Survey

The following online nautical charts were extracted from U.S. Office of Coast Survey, Historical Map & Chart Collection. https://historicalcharts.noaa.gov/historicals/search (8 May 2019).

1879 Coast Chart No. 191: Lakes Borgne and Pontchartrain, Louisiana. https://historicalcharts.noaa.gov/image=LC00191_12_1879 (8 May 2019).

1896 Coast Chart No. 191: Lakes Borgne and Pontchartrain, Louisiana. https://historicalcharts.noaa.gov/image=LC00191_03_1896 (8 May 2019).

USDA

2022 Web Soil Survey. Electronic document, http://websoilsurvey.nrcs.usda.gov/. Accessed 19 July, 2022.

U.S. Geological Survey [USGS], Department of the Interior

The following online maps were extracted from *USGS TopoView*: Map Name Search. https://ngmdb.usgs.gov/topoview/viewer/#4/39.98/-100.06 (21 Jun. 2022). Scanned map images available through *National Geospatial Program:* Historical Topographic Maps, maintained by the U.S. Geological Survey. http://nationalmap.gov/historical/ (21 Jun. 2022).

1891-1967 *New Orleans, Louisiana*; and *Spanish Fort, Louisiana*. 15' series topographic quadrangles.

1892-1969 *Chef Menteur, Louisiana*; and *St. Bernard, Louisiana.* 15' series topographic quadrangles.

1938-2020 *Little Woods, Louisiana*; and *Spanish Fort, Louisiana*. 7.5' series topographic quadrangles.

1939-2020 *Chalmette, Louisiana*; and *New Orleans East, Louisiana.* 7.5' series topographic quadrangles.

Vasbinder, Fiona H.

2005 *King George Island Mounds Site (16LV22): A Late Archaic Mound Complex along the Lower Amite River*. Unpublished M.A. thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Waguespack, Nicole M.
2007 Why We're Still Arguing About the Pleistocene Occupation of the Americas. *Evolutionary Anthropology* 16:63-74.

Walthall, John A.
1980 *Prehistoric Indians of the Southeast Archaeology of Alabama and the Middle South.* University of Alabama Press, University of Alabama.

Webb, Clarence H., Joel L. Shiner, and E. Wayne Roberts
1971 The John Pearce Site (16CD56), Caddo Parish, Louisiana. *Bulletin of the Texas Archeological Society* 42:1-49. Texas Archeological Society, Austin.

Weinstein, Richard A.
1974 *An Archaeological Survey of the Lower Amite River, Louisiana*. Unpublished M.A. Thesis. Department of Geography and Anthropology, Louisiana State University.

Weinstein, Richard, Eileen Burden, and Sherwood Gagliano
1977 Archaeological Phases – Coastal Louisiana. Paper prepared for the Third Annual Meeting of the Louisiana Archaeological Society.

Weinstein, Richard A., and Sherwood M. Gagliano
1985 The Shifting Deltaic Coast of the Lafourche Country and Its Prehistoric Settlement. In *The Lafourche Country: The People and the Land*, edited by P. D. Uzee, pp. 122-148. Center for Louisiana Studies, University of Southwestern Louisiana, Lafayette.

Willey, Gordon R., and Phillip Philips
2001 *Method and Theory in American Archaeology*. Edited and with an Introduction by R. Lee Lyman and Michael J. O'Brian. Classics in Southeastern Archaeology, The University of Alabama Press, Tuscaloosa.

Williams, Stephen
1963 The Eastern United States. In *The National Survey of Historic Sites and Buildings, Themes II and III: Early Indian Farmers and Village Communities,* edited by William G. Haag, pp. 2678-325. National Park Service, U.S. Department of the Interior, Washington, D.C.

Williams, Stephen, and Jeffrey P. Brain
1983 *Excavations at the Lake George Site, Yazoo County, Mississippi, 1958-1960*. Papers of the Peabody Museum of Archaeology and Ethnology Vol. 74. Harvard University, Cambridge.