AN ARCHEOLOGICAL SURVEY OF THE CHALMETTE BATTLEFIELD AT JEAN LAFITTE NATIONAL HISTORICAL PARK AND PRESERVE

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MANAGEMENT SUMMARY

The investigation of Chalmette Battlefield was a joint project conducted by the Southeast Archeological Center (SEAC), Cultural Resources Geographic Information Systems (CRGIS), and Jean Lafitte National Historical Park and Preserve (JELA). The American Battlefield Preservation Association provided the funding for this project.

On this battlefield some of the most significant fighting of the War of 1812 (and it could be argued, on the North American continent) took place. In this battle, a force consisting of regular army troops, militia, pirates, free men of color, and Native Americans, defeated a professional British army. The victory helped propel the American commander, Andrew Jackson, to the presidency and heralded the young United States as a world power.

The Chalmette archeological project began with 221 systematic shovel tests laid out on a 20-meter grid. A total of 22.1 acres representing 15 percent of the park unit's acreage were covered by this method. Of the shovel tests, 69 (31 percent) contained cultural material. None of this material was battle related.

Following the completion of the shovel testing, systematic metal detecting was undertaken. Composite maps produced by CRGIS were used to select the area for survey. Three days of metal detecting were undertaken with as many as 16 volunteers as well as five additional days of metal detecting with three to five volunteers. The metal detecting survey covered 73 acres, representing 51 percent of the total park acreage. These acres include the majority of the area that was shovel tested as well as non-shovel tested areas.

Concurrently with the metal detecting, ground-penetrating radar (GPR) was employed on the battlefield for three days. Since the accuracy of the reconstructed rampart has been challenged, the unit was employed around the rampart. It was also used in the National Cemetery, north of the Malus-Beauregard House, across the Rodriguez Canal, on the suspected area of a Civil War powder magazine, and on the suspected area of the Freedmen's Cemetery. While a number of anomalies were located, the scope of this project only permitted subsurface testing of two of the anomalies found by the GPR.

A thermography unit was employed gratis by a local archeologist in an attempt to locate the British mass burials. Several anomalies were recorded and one was tested with an excavation unit. However, documents maintained by the park indicate that these burials are located well out of the park and the testing did not produce the predicted grave or any other cultural features.

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ACKNOWLEDGEMENTS

This important project grew out of the hard work and dedication of many individuals. We would like to begin with our hosts at Jean Lafitte National Historical Park and Preserve. We must commend Superintendent Geraldine Smith for the support that she and her staff put forward. Two individuals on the staff deserve credit far above the simple praise that can be provided here. They are Chief of Resource Management David Muth and Cultural Resource Specialist Allison Peña. While David was busy with strategic details, Allison provided tactical support. In addition Allison stayed in the field with us from the beginning of this project until the end.

Paul Hawke, Chief of the Battlefield Division, of the American Battlefield Preservation Program (ABPP) graciously provided funding for this project. Thank you for your generous support.

We would like to thank Dr. John Knoerl, Program Manager and Historian David Lowe of the Cultural Resources Geographic Information Systems (CRGIS) for selecting SEAC to jointly undertake this project. The professional manner in which Deirdre McCarthy, Danielle Berman, and Matt Stutts undertook their work during the field portion of this project showed their dedication and skill as well as John and David's leadership. The products and support provided by the CRGIS group were critical to the success of the project.

The dedication and professionalism of the SEAC archeology crew was excellent. Rolando Garza deserves a hearty commendation for serving as the field crew chief. His knowledge of archeology and devotion to duty lifted much of the burden from our shoulders during the project. We would also like to commend archeologist Jill Halchin, archeological technicians Charles Lawson, Ariana Slemmens, Robert Hellmann, and Tyler Cremeens for their hard work and long hours during this project. Dr. Guy Prentice graciously provided Hellmann and Cremeens from the Systemwide Archeological Survey Initiative (SAIP) so additional acreage could be surveyed.

It is a fact that this project would not have been completed without the 460-plus volunteer hours that were provided. Volunteers from three metal detecting clubs located in Tennessee, North Carolina, and Louisiana generously donated their time and expertise to this project. To all of the club members we would like to extend a most heartfelt thanks. However, four individuals deserve special recognition, — Kevin Walls, Randy Slater, Frank Brady, and Richard Angelico. Their long-term commitments and organizational abilities allowed the metal detecting portion of this project to go off without a hitch.

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We would like to thank all of the people that contributed to this report in the form of text, graphics, and fieldwork. Archeology truly is a team effort. If anyone is not mentioned in these acknowledgements it is not because your contribution was not worthy, simply an omission of the authors.

Chapter 1

INTRODUCTION

The Southeast Archeological Center (SEAC) in conjunction with Cultural Resources Geographic Information Systems (CRGIS) and Jean Lafitte National Historical Park and Preserve (JELA) coordinated a multi-disciplinary archeological survey of the Chalmette Battlefield unit of JELA in October 2000 (Figure 1). On this battlefield some of the most significant fighting of the War of 1812 (and it could be argued on the North American continent) took place. In this battle, a force consisting of regular army troops, militia, pirates, African Americans, and Choctaw Indians defeated a professional British army. Andrew Jackson showed his strategic vision during the defense of New Orleans by checking each British maneuver. He showed his tactical vision by selecting the plains of Chalmette as the location of his defensive line. This area, where a relatively narrow plain separated the Mississippi River from a dense swamp was the ideal location for a defensive position. The natural obstacles on both wings prevented the British from flanking the line. But Jackson's true greatness lay in his willingness to fight. He prepared lines between the Chalmette Line and New Orleans in case the Americans had to retreat from Chalmette. Faced with such a well-trained enemy, a lesser commander may have given up. The victory helped propel Jackson to the presidency. It also heralded the United States as a world power–separating the young nation once and for all from British influence.

Non-scientific collecting of artifacts from battlefields has been popular for as long as there have been battlefields. However, systematic collection on battlefields for research is a recent phenomenon. The majority of the historic battles that have taken place on the North American continent produced an abundance of metal artifacts; most

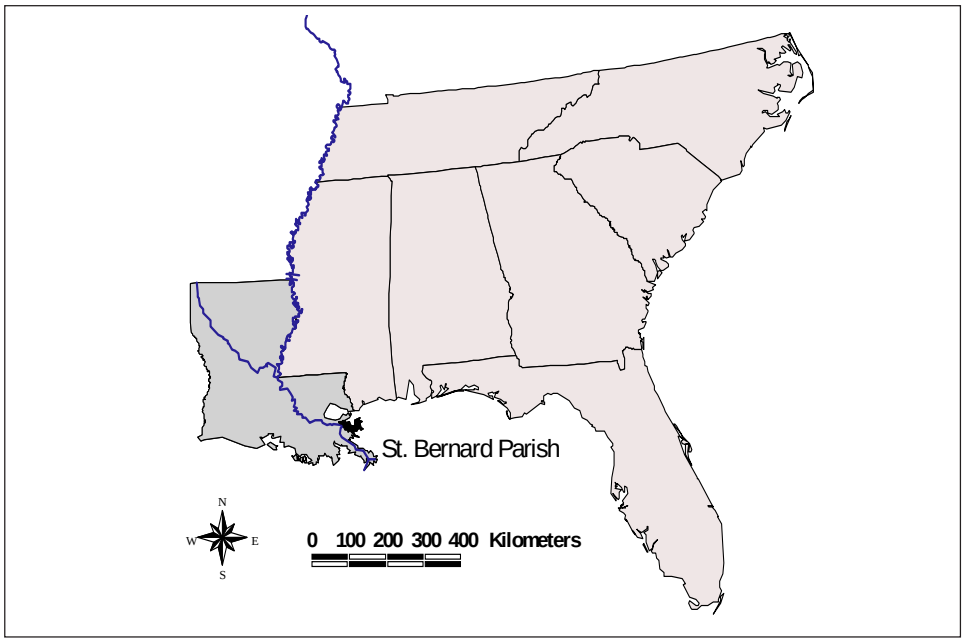


Figure 1. St. Bernard Parish and Jean Lafitte National Historical Park and Preserve.

often in the form of small caliber lead projectiles and larger iron projectiles. Other metal comes in the form of weaponry such as bayonets and personal items such as buttons and harmonica fragments. The majority of wooden and cloth items deteriorated prior to the arrival of the archeologist. Without the use of a controlled analytical method, a skewed interpretation of the battlefield could result due to the large quantity of metal artifacts recovered from metal detecting.

Traditionally, archeologists have practiced two methods when collecting artifacts from battlefields: surface collecting and metal detecting. However, so much metal has been surface collected from most North American battlefields (as shown, for example, by the barrels of Minié balls on display at Gettysburg National Military Park) it is rare when an artifact is encountered simply by viewing the ground surface. Although the other method, metal detecting, skews the data to the metallic side of the spectrum, it is the most efficient tool for collecting a systematic sample of the remaining metal.

The methodology employed at JELA was a version of one employed by Dr. Douglas Scott and Richard Fox at the Little Bighorn Battlefield in which metal detectors and volunteers were used to obtain information about the battle (Scott and Fox 1987). The collection methodology has been modified by SEAC to include teaching the volunteers how to collect the artifacts under the supervision of the archeologist. The transit has been replaced with global positioning system (GPS) technology as the primary mapping tool.

Another change to the methodology was the addition of shovel test pits in selected areas that were to be systematically metal detected. These shovel test pits address several questions (1) will

Figure 2. Shovel testing near the reconstructed Line Jackson.

other standard archeological techniques produce the same results as metal detecting, (2) will non-metallic battlefield debris be represented in the shovel test pits, and (3) how effective is shovel testing on a battlefield as a cultural research methodology?

PROJECT OVERVIEW

During the planning phase of this project, the CRGIS crew made electronic projections of historic maps that would be used to guide the fieldwork. CRGIS also conducted background research to determine the accuracy of maps and the movement of the Mississippi River. They produced maps for the project with the digitally rectified locations of the main British attack on January 8, 1815, the locations of a Civil War powder magazine, and the Freedmen's Cemetery.

The fieldwork began with 221 systematic shovel test laid out on a 20-meter grid (Figure 2). A total of 22.1 acres representing 15 percent of the park's acreage was covered by this method. Of the 69 excavated shovel tests, 31 percent contained cultural material. Despite the fact that none of this material can be related to the battle, the poor shovel test results are neither unexpected nor disappointing. When this same methodology was applied at Civil War battlefields such as Shiloh and Stones River, where artifact densities are higher as a function of the greater number of people present and firing on the battlefield, virtually the same results were obtained. A corrresponding pattern was found on Revolutionary War battlefields, such as Guilford Courthouse and Kings Mountain. Having similar weaponry, army sizes, and tactics, these two battle locations had an artifact density that was the same or lower than that of the Chalmette Battlefield.

After completing the shovel testing, systematic metal detecting was undertaken. Three days with groups as large as 16 volunteers and five additional days of metal detecting with three to five operators was undertaken. A total of 73 acres representing 51 percent of the total park acreage was systematically examined. These acres include the majority of the area that was shovel tested as well as non-shovel tested areas. Known archeological remains of historic buildings were avoided. Since other forms of archeological investigation are more appropriate for these historic resources they were left intact for future researchers.

Concurrent with the metal detecting, ground-penetrating radar (GPR) was employed on the battlefield over a three day period. Since the accuracy of the reconstructed rampart has been challenged, the GPR unit was employed around the rampart. It was also used in the National Cemetery, north of the Malus-Beauregard House, across the Rodriguez Canal, on the suspected area of a Civil War powder magazine, and on the suspected area of the Freedmen's Cemetery. While a number of anomalies were located, the scope of this project only permitted subsurface testing of two of the anomalies found by the GPR.

A thermography unit was employed gratis by a local professional archeologist in an attempt to locate the British mass burials. Several anomalies were recorded and one was tested with an excavation unit. However, documentary sources indicate that these burials are located well out of the park (Latour 1999, Smith 1903) and the testing did not produce the predicted grave or any other cultural features.

The CRGIS field crew used GPS to record the locations of all roads, walls, buildings, monuments, shovel tests, metal detector recovery locations, GPR transect and anomalies, and thermography anomalies. They also collected additional control points for the rectification of maps and conducted additional documentary research.

Following completion of the field portion of the project, the artifacts were brought to SEAC where they were washed, analyzed, and cataloged. The SEAC crew entered the results into a database. Appropriate artifacts were selected for conservation and placed in electrolysis. The CRGIS crew assembled and edited the field maps and produced many of final graphics for this report.

Chapter 2

ENVIRONMENTAL SETTING

The final victorious hours of the Battle of New Orleans took place on plantation lands located along the Mississippi River in what is now Chalmette, Louisiana in St. Bernard Parish. Once dotted with working plantations this highly industrialized district bares little resemblance to the place where General Andrew Jackson led a ragtag group of Americans to victory over seasoned professional British troops. The National Park Service preserves what is left of the battlefield on a small green space in the middle of a landscape of cement and asphalt. The park's 141–plus acres cover only a small portion of the original battlefield. It is bordered on the east and west by industrial plants, on the north by St. Bernard Highway, and on the south by a towering levee and the Mississippi River. The natural and man altered environment of the area no doubt played a major role in the decisions and in the outcome of the battle.

PHYSIOGRAPHY

By 1815, the landscape of Chalmette had been transformed by a century of French settlement, a transformation greatly influenced by the natural environment. Together, those changes and the natural resources influenced the location and outcome of the battle. The topography of the Chalmette Battlefield is typified by a terrain of subtle relief that developed in the Mississippi River Delta region upon the Deltaic Plain. With an elevation of only 2 to 8 feet above sea level and a high water table, the Deltaic Plain was deposited during the Holocene Period and is a more recent extension of the larger Mississippi River Delta (Saucier 1994). Some 10,000 years ago at the end of the Pleistocene epoch this delta did not exist. Paleographic reconstruction places New Orleans and the surrounding area not on a delta but on an upland landmass. But, during the Holocene, rising sea levels inundated the landmass and ca. 6,000 years ago that same area was located in the Gulf of Mexico. Around this same time (6,000 B.P.), a decrease in the rate of the rising sea level and a steep sloping area located on the Pleistocene surface in the New Orleans area slowed the rate of shoreline retreat (Saucier 1994). A large accumulation of sand at the mouth of the Pearl River formed a linear sand shoal, which emerged into a beach ridge and further slowed the rising sea level. The combination of several physiographic variables acted together to create an environment that allowed a rapid influx of Mississippi River sediments to build up (Saucier 1994). This type of accumulation creates landmasses known as deltas. They can extend over thousands of square kilometers and have complex ecosystems, as is the case of the Mississippi River Delta. Today the Mississippi River Delta area is characterized by bayous, swamps, marshlands, natural and man-made levees, streams and rich alluvial bottomlands (Risk 1999). Influenced by the Mississippi River, this delta is not a static landform and it has and will continue to change (Tarbuck and Lutgens 1991).

HYDROLOGY

The Mississippi River is the major hydraulic force in the area. The tributaries and swamps that are associated with the river helped to create one of the more unique ecosystems of the world. The course of the river and tributaries are continually adjusting to compensate for the naturally occurring changes in gradients as well as the human-induced changes, produced by artificial levees and dredging. As stream courses shift they uncover and cover prehistoric and historic sites. The natural erosional process of the mighty river, along with

the help of man, through road building and artificial levee construction, have claimed approximately 180 ft of the original American defense line at Chalmette (Birkedal n.d.).

SOILS

The American defense line was originally constructed on plantation lands. Plantation owners were drawn to the area because of the rich alluvial soils. The soils of the battlefield are characteristic of the Sherkey-Commerce series (Trahan 1989). This series is represented by poorly drained, frequently flooded soils that occupy low and intermediate elevations on natural levees in St. Bernard Parish and the Mississippi Delta region. During dry periods the soils may crack leaving fissures as wide as 1.5 inches and as deep as 20 inches (U.S. Dept. of Agriculture 1989). Plantation owners recognized the advantages of rich delta soils and manipulated the water table by digging agriculture ditches and draining the lands into the bordering cypress swamps. This enabled them to grow profitable crops such as cotton, sugar cane and indigo. These crops were well adapted to the southern Louisiana climate.

CLIMATE

The climate is subtropical with humidity often reaching 90 percent (NPS 1976). The average precipitation is approximately 59.35 inches per year and, based on the averages of temperatures taken from 1955 to 1977, the hottest months are July (81.8°) and August (81.1°) and the coldest are January (52.0°) and December 54.6° (U.S. Dept. of Agriculture 1989). Throughout the winter and spring months the temperature of the water in the Mississippi River is typically colder than the surrounding air. This often results in the formation of river fogs. During the summer, winds usually blow from the southeast and frequent afternoon showers usually keep the temperature from climbing above 100°. During winter, winds typically blow from the northeast keeping winters mild. These generally mild temperatures are seasoned with brutal cold snaps and heat waves. This was the case during the Battle of Chalmette when the cold, humid winter temperatures tormented even the most seasoned of the British soldiers. Although the British suffered from the cold, this was preferable to what they would have suffered had they attacked during the summer.

FLORA AND FAUNA

There is a direct correlation between the temperature and the types of active flora and fauna in the area. During the winter months some of the flora and fauna are dormant or very lethargic. But during the summer, the river, swamps and bayous are alive with a variety of species, some of which are extremely annoying if not deadly. There are several species of venomous snakes and numerous biting insects. In the past, the mosquitos wreaked havoc on populations with no immunities to the diseases they often carry. This was the case with the British soldiers and although they were not aware that it was the bite of this tiny insect that caused fevers and often death, they did associate the illnesses with the summer months. To cope with this problem the British brought black troops from the West Indies to occupy the city of New Orleans during the summer months (Pickles 1998) and choose the winter months to initiate their battle plans at Chalmette.

The flora in the summer is also more abundant with large patches of poison ivy and forest thick with almost impenetrable undergrowth. The year round flora of the natural landscape (baring human intervention) is characterized by three distinctive forest associations, all associated with the river. Directly adjacent to the river are the natural levees. On them grow species adapted to extreme fluctuations in water levels such as willows (*salix* spp.), cottonwood (*Populus deltoides*), sweet gums (*Liquidambar straciflua*) and sycamores (*Plantanus occidentalis*). The flora of the levees grade into hardwood forest made of oaks (*Quercus* spp.), pecan (*Carya illinoinensis*), magnolia (*Magnolia grandiflora*), beech (*Fagus*

grandifolia), and hickory *(Carya* spp.) all interspersed with brakes of native cane (*Arundenaria* spp.). Then the terrain gently descends into the backswamps, with cypress (*Taxodium distichum*), tupelo gum *(Nyssa aqutica*), swamp oak (*Quercus michauxii*), swamp red maple (*Acer rubum*) and palmetto (*Sabal minor*) (Risk 1999). There are thousands of additional species that grow in the area and help to create one of the most unique and intricate environments in the world.

Many of these environmental factors played heavily in the Battle of Chalmette. The time of year, the natural and the manipulated environment, all directly influenced the battle. As the British fought for control of the region and its mighty waterways, they found the area to be an extremely inhospitable environment. Conversely, the diverse group of Americans, more acclimated to their surroundings, found the setting full of the resources needed to protect their young nation.

Chapter 3

HISTORIC BACKGROUND

PRE-BATTLE LAND USE

The resources of the Deltaic Plain have beckoned humans for thousands of years, and although there is no archeological evidence of human utilization or occupation in Chalmette prior to the Tchula period, 500 B.C., the Lower Mississippi Delta region does have a long history of human occupation (Table 1). The landmass upon which the sediments of the Deltaic Plain were deposited was exposed for the last 30,000 years, with the exception of a 1500-year period between ca. 4,000 B.C. and ca. 2,500 B.C. when the area was inundated by seawater. Paleographic reconstruction maps for this period show the landmass changing from upland to submerged to its current state as a delta (Saucier 1994). Any sites older than the formation of the Deltaic Plain would have been submerged by the rising sea levels and then deeply buried by the sediments of the Mississippi. The varying geomorphic characteristics of the area make finding older sites challenging at best.

PREHISTORIC

The Paleoindian period is considered to date from 12,000 B.C. TO 8,000 B.C. There is still a debate over how and when humans first arrived on the North American continent, but it is generally agreed that those first individuals came in small nomadic hunting groups that followed large megafauna across the continent. Within southeast Louisiana the Paleoindian period is classified into two subdivisions, the earlier known by its distinctive Clovis style projectile points and limited associations with Pleistocene megafauna. The second, known as the San Patrice/Dalton period, is the proceeding Late Paleoindian period and is characterized by a shift to a more sedentary existence and the utilization of a broader subsistence base. These shifts are thought to have been an adaptation to the changing postglacial environment (Chase et al. 1988). When and if, any of theses nomadic groups made it into the Chalmette area is still unknown. As mentioned above, the archeological evidence of such visitations is most likely buried deep within the alluvial deposits of the Mississippi River.

The possibility exist that also buried under the Mississippi River alluvial deposits could be the remnants of what is known as the Archaic culture, which dates from 8,000 B.C. to 1500 B.C. Large stemmed projectile points, groundstone artifacts and

Table 1. Cultural Chronology of Southeastern Louisiana.

Time Interval	Period	Culture	Geomorphology
A.D. 1500 to the present	Historic	Various cultures	Deltaic Plain
A.D. 1000 to A.D. 1500	Mississippi	Mississippi/Plaquemine	Deltaic Plain
A.D. 700 to A.D. 1000	Coles Creek	Coles Creek	Deltaic Plain
A.D. 400 to A.D. 700	Troyville	Baytown-Troyville	Deltaic Plain
0 to A.D. 400	Marksville	Marksville	Deltaic Plain
500 B.C. to 0	Tchula	Tchefuncte	Deltaic Plain
2000 B.C. to 500 B.C.	Poverty Point	Poverty Point	Deltaic Plain
8000 B.C. to 1500 B.C.	Archaic Late-Middle-Early	Archaic	Deltaic Plain/inundated/upland
12,000 B.C. to 8000 B.C. (?20,000 B.C.)	Paleoindian Late-Early	Paleoindian & San Patrice/Dalton	upland

bone and lithic tools characterize Archaic assemblages from Southeastern Louisiana. These tools, as well as the faunal and floral remains that have been found in Archaic sites, reflect a further shift towards a broader foraging subsistence economy. During this temporal division the populations were becoming even more sedentary and by the end of the Middle Archaic had begun building earthen mounds. No Archaic sites have been recorded within the St. Bernard Parish but this should not exclude Archaic people from the list of possible inhabitants.

The next cultural sequence is known as Poverty Point. This period dates from 2000 B.C. TO 500 B.C. Although the chronology of this culture places its beginnings in the Archaic (Prentice 2000) the diverse artifact assemblage of fired-clay objects, microlithics and the rare find of a piece of pottery, distinguish it from earlier cultures (Kniffen et al. 1987). The Poverty Point culture was socially and technologically advanced for this time period, as noted by their diverse artifact assemblages and large complex geometric mounds. This culturally significant society disappears from the archeological record around 500 B.C. Again there are no recorded sites for this period within the St. Bernard Parish but there are several sites found in close proximity.

The Tchefuncte culture (Tchula period) began around 500 B.C. and ended around A.D. 0. This group practiced Archaic subsistence strategies with an increase in the use of riverine resources. The tool assemblages of the Tchefuncte culture closely resemble their Archaic predecessors. The culture is known best for its large burial mound complexes and the first widespread use of ceramics. It is also suggested that Tchefuncte culture formed the basis for a succession of increasingly more complex societies. There are four known sites with Tchula period components located within the St. Bernard Parish (Chase et al. 1988).

The Marksville period is seen as both a continuation of the Tchula period and a local adaptation of the Northern Hopewell culture (Chase et al. 1988). The Marksville period dates from A.D. 0–A.D. 400. During this period the Native Americans practiced elaborate mortuary ceremonies and constructed numerous burial mounds with log-lined crypts. Although not extensively, they did take part in the Hopewellian Interaction Sphere (Prentice 2000). Their assemblages included a variety of decorative ceramics and a large tool assemblage. Fourteen known sites with Marksville period components are located within the St. Bernard Parish (Chase et al. 1988).

The Troyville period is described as a transitional period between Marksville and Coles Creek periods. This period dates from A.D. 400 to A.D. 700. Known as Troyville or Baytown, depending upon location of the site, this cultural division is marked by the introduction of the bow and arrow into Louisiana, the construction of flat-topped mounds and possibly the first introduction of maize into the area. There are fourteen known sites with Troyville or Baytown period components located within the St. Bernard Parish (Chase et al. 1988).

The next period is defined as Coles Creek and is often grouped with the Troyville period. The Coles Creek period dates from A.D. 700 to A.D. 1000. It marks the first documented evidence of maize and cucurbit cultivation in the area and is characterized by large flat-topped pyramidal shaped mounds, often topped with wattle-and-daub structures. At larger centers the mounds encircle an open plaza area. The artifact assemblages contain small triangular projectile points and new varieties of ceramic designs and tempering agents. There are four known sites with Coles Creek Period components located within the St. Bernard Parish (Chase et al. 1988).

The Mississippian period is represented locally by the Plaquemine culture. The Mississippian period dates from A.D. 1000 to A.D. 1500. This cultural division is a continuation of the proceeding Coles Creek period, overlapping in many cultural traits. Both built sparsely populated mound centers that served as ceremonial gathering places rather than villages, had similar subsistence strategies and produced similar ceramic styles. It is now suggested that many of the pottery types previously used to characterize this group were actually produced in the late Coles Creek period (Hally 1972). One of the notable differences in the two cultures is seen in the size and numbers of mound

systems built, with the Plaquemine constructions considerably outweighing the Coles Creek. There are two known sites with Plaquemine and Mississippian period components located within the St. Bernard Parish (Chase et al. 1988).

Historic Period

At the time of European contact the complex social structures that had allowed for the construction of immense mound sites was in decline. The exact cause is unknown, but by the time de Soto arrived in the Southeast in A.D 1539, certain powerful chiefdoms had collapsed (Prentice 2000). In 1682 Sieur de La Salle recorded the identities and locations of the remaining groups in Louisiana and he listed the linguistic groups of the Muskhogean and the Chitimacha as inhabiting the St. Bernard Parish. By 1714 when the French established the first settlement in Louisiana these groups no longer existed in the parish (Chase et al. 1988).

As the French settled the region they divided the land based on the French system of survey that used the arpent, a measure of 192 feet (Figure 3). Land grants along the Mississippi River in the St. Bernard Parish were generally elongated blocks comprising a portion of river frontage, levee and swamp. This configuration maximized the number of grants with river frontage, ensuring each settler access to the river for transportation purposes, to the natural levees for agricultural production and to swamp land for the natural timber resources.

Plantations sprang up along the river and the land was manipulated with man-made levees, canals, and drainage ditches, readying the parcels for the profitable business of agriculture. By 1751 practically all the land between New Orleans and the current borders of St. Bernard Parish and Plaquemine Parish was planted in indigo. Indigo, a plant used to make a popular deep blue dye, would prove non-profitable to the plantations owners. It was not well suited to damp climate and the toxins that it produced during processing were deadly to the slaves who handled it. After trying various other crops, plantation owners would eventually switch to sugar cane and cotton, both of which became very profitable (Chase et al. 1988).

As a result of a treaty, the Spanish ruled Louisiana from A.D 1763–1800. This short period in the history of Chalmette was both detrimental and beneficial. The initial occupation of the Spanish gov-

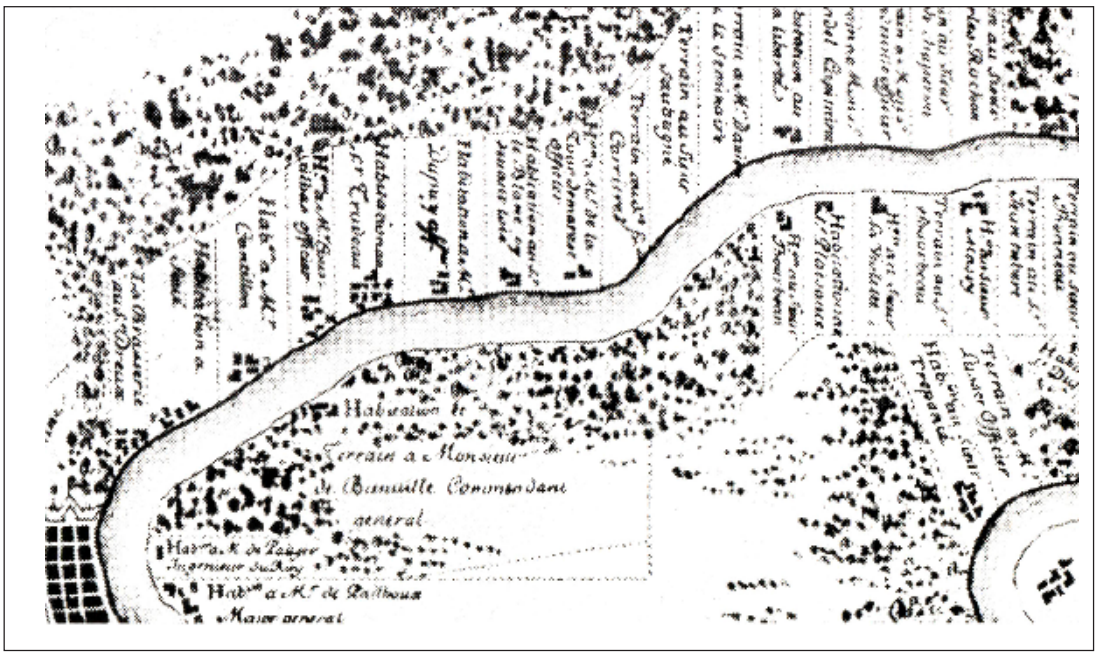


Figure 3. The French Colonial map showing the method of granting land (Newberry

ernment and its officials was not well received by many of the French settlers and the strict trade regulations imposed by the Spanish government disrupted the plantation economy (Chase et al. 1988). But in 1777, under the leadership of a new governor, 21-year-old Don Bernardo de Gálvez, the situation would improve. New colonists were brought into the area and by the time the land was ceded back to France it had become one of the most progressive locations in the area (Chase et al. 1988).

In 1800 Spain ceded Louisiana back to France and in 1803 the United States purchased it for $15 million dollars. Initially the transfer of power was not well received and again the settlers were required to make changes in their lifestyles. As new American settlers arrived the cultural demographics of the area changed and diversified. Property lines and property owners changed as plantation lands were sub-divided and combined.

Just prior to the battle at Chalmette the properties along the river where the battle took place consisted of a series of plantations cut with drainage ditches and canals (Figure 4). On the east end of the battle line was the Villeré Plantation, where the British set up their army headquarters and a hospital. Moving west the next plantation was the La Coste Plantation, De La Ronde, Bienvenue, Rodriguez, Chalmette and the smaller land holdings of the Macarty, Langville, Sigur and the last plantation in the battle line, the Delery.

It would be the Chalmette Plantation hat would see the climax of the battle. It was here, along an old millrace that became known as the Rodriguez Canal, that the final battle of the War of 1812 was fought.

THE BATTLE

Situated in the center of what is now a highly industrial area just six miles outside of downtown New Orleans is the unassuming bit of ground, where in the War of 1812, General Andrew Jackson (Figure 5) led an assortment of troops to victory over seasoned British troops. The battle that took place in this small field created an alliance between some of the most unlikely factions. General Jackson brought together the skills of pirates, Choctaw Indians, frontiersmen, engineers, free African Americans, and soldiers for the triumphant conclusion of the Battle of New Orleans at Chalmette. Their victory ratified the independence of the emerging nation from Great Britain.

It was just after dawn on Christmas Eve in the year 1814 during the Battle of New Orleans when after a fierce night of fighting, Jackson's troops fell back to an old millrace known as the Rodriguez Canal, that could be used as a defensive position. The millrace stretched across the narrow section of a sugarcane field on the Chalmette Plantation only a few miles from where they had just engaged the British in battle. Very few of Jackson's men had any training in European military techniques and, realizing that his men could not compete with seasoned British troops in an open bayonet encounter, Jackson made the decision to use the canal to set up a defensive line.

The British, not knowing the number of American troops they were facing and having heard rumors that their numbers were significant, decided to stay their position and wait for reinforcements. Had the British known that the number of American soldiers had been greatly exaggerated and that they were also ill-prepared to take on the British in hand to hand combat their strategies would have likely been different.

Taking advantage of the old millrace and its natural borders-of the Mississippi River on the south end and an almost impenetrable cypress swamp on the north, the Americans began fortifying their position. General Jackson's engineers cleverly utilized the materials that were available, cypress logs, fence posts, cotton bales and mud (Green 1985) and designed a makeshift rampart. All able-bodied soldiers were required to take part in the construction, and although this did not sit well with several of the aristocratic Creoles, who likened the work to slave labor, it quite possibly helped to build solidarity among the men that would later prove advantageous during battle (Pickles 1993).

The ramparts and the batteries on both the American and the British sides were ongoing projects (Figure 6). Vincent Nolte, a New Orleans

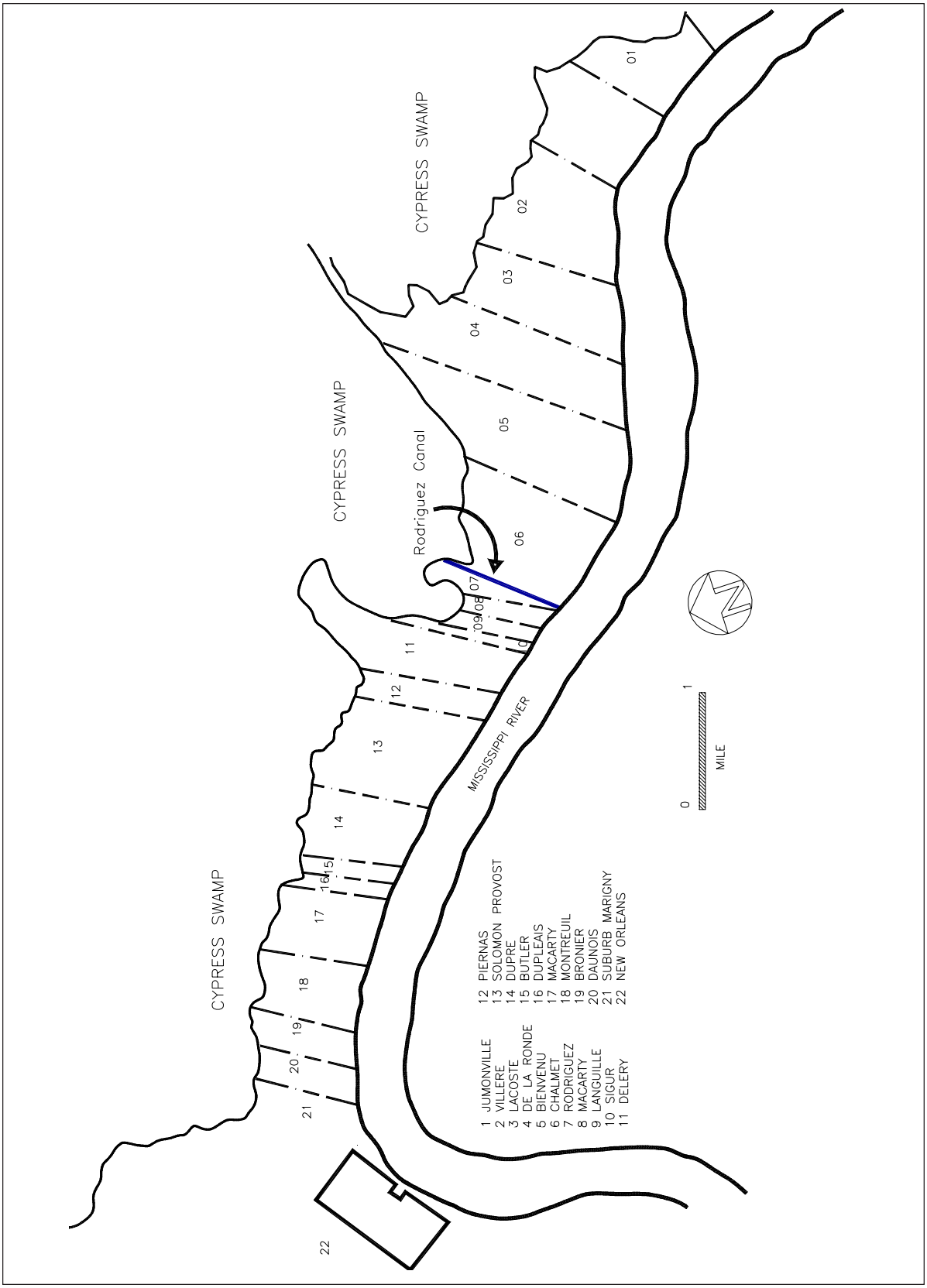


Figure 4. Map showing plantation property owners within the 1815 battle line.

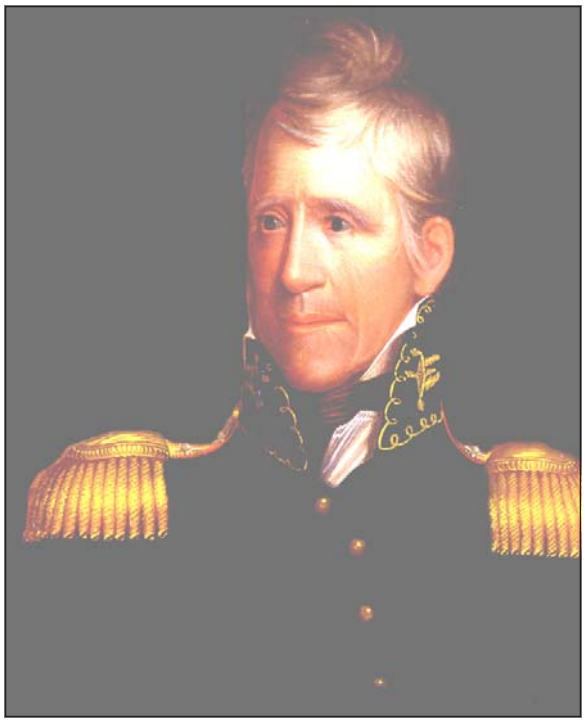


Figure 5. The American Commander, Andrew Jackson (National Portrait Gallery, Washington,D.C.).

merchant who held a position on the American rampart and who also owned the cotton bales used in the batteries, recounted the building of Battery Number 3. Nolte described it as reinforced with his cotton bales to a height of three or four bales with wooden platforms built upon them to support the weight of the cannons (Goodwin 1991). It is mentioned that the British also built their fortifications with supplies belonging to Mr. Nolte, although it is not certain how they came in possession of them. Along the British line they made use of Mr. Nolte's full sugar barrels to build their breastworks. This would prove an expensive mistake for the British, as the barrels—unlike cotton bales—did little to stop the balls shot at them (Roush 1958).

As Christmas day came and went most of Jackson's men continued to work on the rampart, while others stood guard or harassed the enemy. From their position on the Mississippi River, the American ships the *Louisiana* and the *Carolina* rained grapeshot into the British camp, while crack Tennessee and Choctaw snipers plagued British pickets. Unaccustomed to such brazen forms of

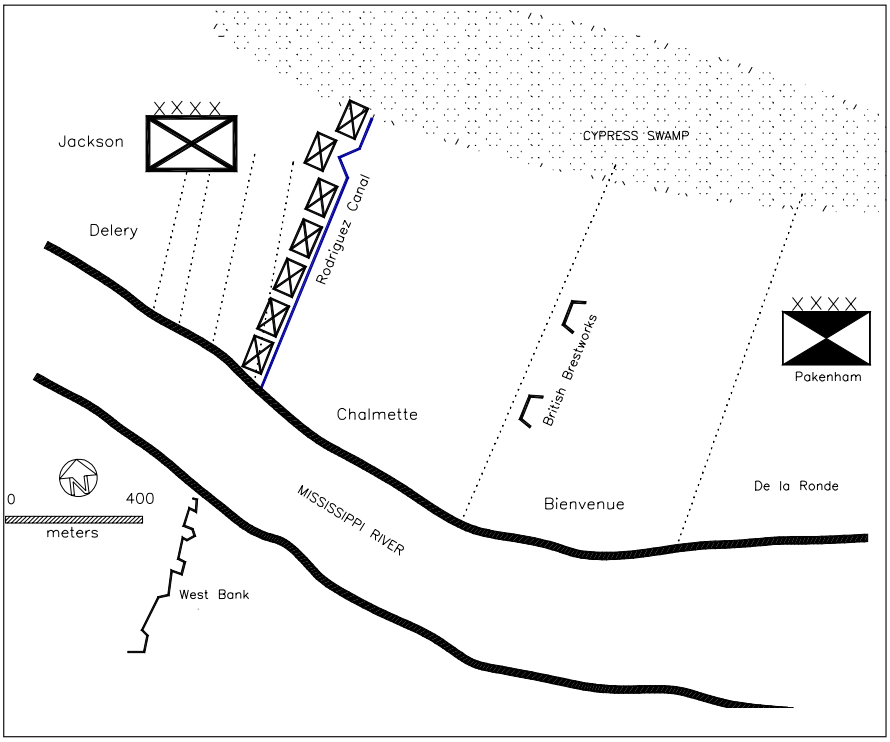


Figure 6. Map with canal, swamp, river, U.S. and British Lines (After Pickles 1993).

warfare a British officer likened the Americans to barbarians (Hinkley 1990).

On 26 December the British Commander-in-Chief, Major General Sir Edward Pakenham, (Figure 7) arrived with reinforcements. The British troops then numbered somewhere around 4000, but still unaware of how few troops Jackson actually had, they waited for additional reinforcements. Almost immediately Pakenham acted to end the constant harassment by the *Carolina* and the *Louisiana*. Early on the morning of the 27, British gunners fired hotshot (red hot cannon balls) into the *Carolina* setting it ablaze (Roush 1958). The *Louisiana* escaped the same fate by retreating to a safe distance.

Having rid himself of the rain of grape shot from the *Carolina*, Pakenham was ready to move forward and on the morning of December 28, shortly after the fog had lifted, British troops marched out ready for battle. When the British crossed the fields, the American pickets withdrew from the advance positions they had held at the De La Ronde and the Bienvenue plantations. As they fled the outposts, they set fire to the outbuildings and the cane stubble in the surrounding fields (Pickles 1998). Pakenham's men advanced approximately two miles across the fields without any hindrances (Roush 1958) but the burning fields and the bending river obscured their view of the enemy and by the time they saw Jackson's line they were only 700 yards away (Pickles 1998).

Jackson's troops had not yet finished the rampart construction when the British attacked and the first enemy artillery hit the line. An American detachment under Colonel Hutchinson was sent to the far left of the rampart to prevent the British from breaking through at the border of the swamp. But Colonel Hutchinson was killed in the first British onslaught and his men withdrew to the center of the line in the confusion (Rouse 1958). With the help of the *Louisiana*, which fired some 800 rounds (Hickey 1990), the Americans sent a torrent of iron and lead into the British line. Under a hail of American artillery and much to the distress of his troops, Pakenham called for a retreat (Roush 1958). Had he any idea how weak and fragile the far left of the American line was, the battle might have had a very different ending.

Figure 7. The British commander, Major General Sir Edward Pakenham (National Portrait Gallery, London).

But Jackson had gained another reprieve and set about the task of finishing the rampart. He had his men extend to the far left of the line into the swamp, and also had them reinforce the areas that had proven weak. The actual line now stretched over one mile, ending in the swamp (Hickey 1990). Jackson also had his men construct two additional lines closer to the city in the event they had to fall back during battle (Hickey 1990). And again he had his men harass the British camp. Tennessean snipers picked off British sentries and until the British placed howitzers that could reach her, the *Louisiana* showered them with grape shot (Roush 1958).

Both sides spent a great deal of effort ensuring that their guns and ammunition were ready and adequate. Pakenham was also reinforcing his line and building new batteries. But Pakenham was

building his batteries on a foundation of sugar barrels.

On New Years Day 1815, the fog was heavy but the spirits of the Americans were not as they prepared to celebrate the New Year. The rampart was buzzing with activity. Soldiers were in their best uniforms, the band was playing, and civilian visitors were waiting for the planned parade. What arrived however was not a festive procession but an explosion of British artillery (Roush 1958). The civilians scattered and the soldiers ran to their posts to quickly return fire. The artillery duel was over almost as quickly as it started, for the inadequate sugar barrels the British had used in their fortifications did nothing more than sweeten the earth beneath the batteries. Their batteries were quickly destroyed and their cannoneers killed. The British also made another infantry attack, but were easily driven back, so that by early afternoon the sounds of fighting had ceased. It was Dominique You and the other Baratarian Pirates who stood out on New Years Day as extremely skillful cannoneers (Roush 1958).

Again the British fell back to wait for additional troops. By the time the final battle occurred the total number of British troops confronting Jackson was almost 7000. The Americans had managed to muster almost 4000 men, of which less than 1000 were regular troops (Pickles 1998). The Americans would not be caught off guard again and paid close attention to British activities. On January 7 they noticed an increase in enemy activity. Throughout the night they kept careful watch and their vigil paid off, for in the early morning hours of January 8th the British launched their final full assault.

On January 8, 1815, Pakenham tried one last time to unseat Jackson's line with a three-pronged attack. Under the cover of darkness he sent 600 troops across the river to attack a small U.S. battery that guarded the West Bank of the Mississippi River. Once they had taken control of the guns in the battery they were instructed to turn them upon Jackson's line (Pickles 1993). The smaller of the other two prongs was a frontal assault down the Levee Road. The main assault struck the north end of Line Jackson, just south of the swamp (Figure 8). But before it was over, all of Pakenham's undertakings would turn sour.

The assault on the West Bank battery first went awry when the small canal used to transport the boats to the river collapsed and several of the boats never made it into open water. Already having a late start, several more floated too far down stream. They did eventually take the American battery and the weapons, but it was too late and they were not prepared when the main attack occurred (Roush 1958). Pakenham was fully aware of the situation and knew he would be unable to depend on the battery for support during the main attack. He also knew he could not delay the battle until they were in position because his men would be attacking in full daylight. However, he refused to postpone the battle.

Pakenham advanced his troops across the fields through the cold morning mist. Keeping in tune with the already disastrous morning, bundles of cane and ladders to be used in crossing the rampart were forgotten and several soldiers had to retrieve them. Then, just as the British troops approached the American line, the fog lifted and left them fully exposed. As the British advanced toward the little mud rampart, the Americans opened fire and the British had little chance as the musket balls and canister shot ripped through the lines. Many seasoned soldiers fled and others threw themselves to the ground trying to avoid the wall of iron and lead (Hickey 1990). As Pakenham rode past his men, trying to rally them and restore their courage, his horse was shot out from under him. He quickly acquired another, but was only in the saddle for a short time when a cannon ball ended his command. With Pakenham dead, General John Lambert took command of the troops and promptly called a retreat. He then requested an armistice and the dead and wounded were removed from the battlefield and carried to Bienvenue plantation for burial (MHRP 1941 Vol. 347, pp 291–292).

The final episode in the Battle of Chalmette had lasted less than two hours with over 2000 British casualties. The Americans, on the other hand, lost 63 men in the battle for the West Bank and 13 from behind Jackson's Line (Hickey 1989). The British maintained their position for another ten

Figure 8. Contemporary painting of the Battle of New Orleans (New Orleans Museum of Art, gift of Col. and Mrs. Edgar Garbish).

days, but when they did relinquish their position and return home they left behind many of their seriously wounded and buried all of the deceased soldiers in a mass grave. General Packenham's remains were sent home (Hickey 1989).

POST-BATTLE LAND USE

Nearly two centuries later, visitors approach Chalmette Battlefield on the St. Bernard Highway about 6 miles east of New Orleans. Traveling down the St. Bernard Highway, they are struck by the amount of industrial activity along the river. The Chalmette Slip bounds the park on the northwest. Continuing beyond the park entrance, they will pass the National Cemetery that dates to the Civil War. Adjacent to the National Cemetery is the former Kaiser Aluminum Refinery and Waste Site. This facility adds smoke stacks and landfill mound to the view from the park. Further along the highway the remains of the once stately De La Ronde House is located in the center of the divided highway. The majestic Pakenham oaks that lined the entrance road to the De La Ronde House share a boundary with a parish prison bright with concertina wire and floodlights.

Turning into the park off the St. Bernard Highway, the visitor crosses the Norfolk Southern (previously Mexican Gulf) railroad. The visitor travels down the park entrance road toward the Chalmette Monument. On the left is the reconstructed Line Jackson, which consists of the earthwork, canal, and several reconstructed batteries. About 200 meters into the park, the reconstructed Line Jackson is broken to allow the tour road traffic to flow back onto the entrance road. The visitor center and the comfort station are located southeast of

the Chalmette Monument. Past the visitor center is the Rodriguez House archeological site, the Spotts Monument, the levee, and finally, the Mississippi River. To the east near the levee is the post battle Malus-Beauregard House.

The reconstructed Line Jackson ends near the Chalmette Monument. Between the monument and visitor center, the tour road begins heading to the southeast into the battlefield. As the tour road approaches the Mississippi River a road leads southeast to the St. Bernard Sewage Treatment Site, which is located at the edge of the park alongside the levee. As the tour road curves to turn north, to the east is the probable site of the Civil War powder magazine. At this point the road parallels the National Cemetery wall and crosses the post-Civil War period Freedmen's Cemetery. The second tour stop on the interior of the tour road is a reconstructed earthworks representing a British cannon position. As the tour road begins to turn back toward the Entrance Road, another road continues to the north. This road leads to site's administrative headquarters and maintenance facility. Between the maintenance road and the Entrance Road, is a wooded area north of the tour route. This area was allowed to grow to represent the swamp that was on the American left during the battle, although research has shown that the swamp was outside of the park to the north. About halfway back to the Entrance Road a dirt road that bisects the park can be seen running northwest/southeast. On the eastern side of this road was the Fazendeville community, a post-Civil War African American settlement before it was removed from the battlefield in the 1960s.

The park was created from several pieces of property. The first of these, the Rodriguez property, passed through the hands of several individuals until it was acquired by the state of Louisiana in 1855 (Risk 1999:16). The Chalmette property also passed through a number of hands and was subdivided. The tract on which the Malus-Beauregard House was built in ca. 1833 was acquired by the state of Louisiana in 1948 and transferred to the National Park Service in 1949 (Risk 1999:18).

In 1861, another portion of the Chalmette property was acquired by the city of New Orleans. Bienvenue Planis Because of its location, the Confederates constructed an earthwork here overlooking the river. Following the Civil War, the second portion of the Chalmette property came into the possession of the federal government. The land was used as a camp for Confederate soldiers and a cemetery for freed slaves and Union soldiers. The slice of the original Chalmette property that falls between the Malus-Beauregard property and the National Cemetery is the most interesting. In 1857 Jean Pierre Fazende inherited the property (Risk 1999:18). Fazende, a free person of color, subdivided his property and began selling individual lots in the 1870s. On the land tracts, the Fazendeville settlement grew and prospered and built its own church and store (Figure 9). The National Park Service began acquiring the community's battlefield land to consolidate their holdings between the monument and National Cemetery. The last of the houses were removed in the 1960s.

Development of the Park

The first commemoration of the battle of Chalmette took place on January 8, 1840. Risk (1999:19) states that, according to legend, the cornerstone of the monument was laid at that time. In 1852, the state of Louisiana appropriated $5,000 to purchase a site for the monument resulting in the 1855 purchase of the Rodriguez tract. In that same year the state began construction of the monument. It was envisioned to be a 150-foot tall Egyptian style obelisk. By 1859, all funds were expended and monument construction stopped at fifty-six feet (Risk 1999:19).

In 1893, the Louisiana Society of the United States Daughters of 1776 and 1812 were given control of the monument. In 1908, following repeated requests by the Daughters, the federal government provided funds to complete construction of the monument. The monument was capped at just over 100 feet, never reaching its planned height. In 1930, the War Department assumed control of the monument but three years later it was transferred to the National Park Service. During the Depression, the park created an access road from

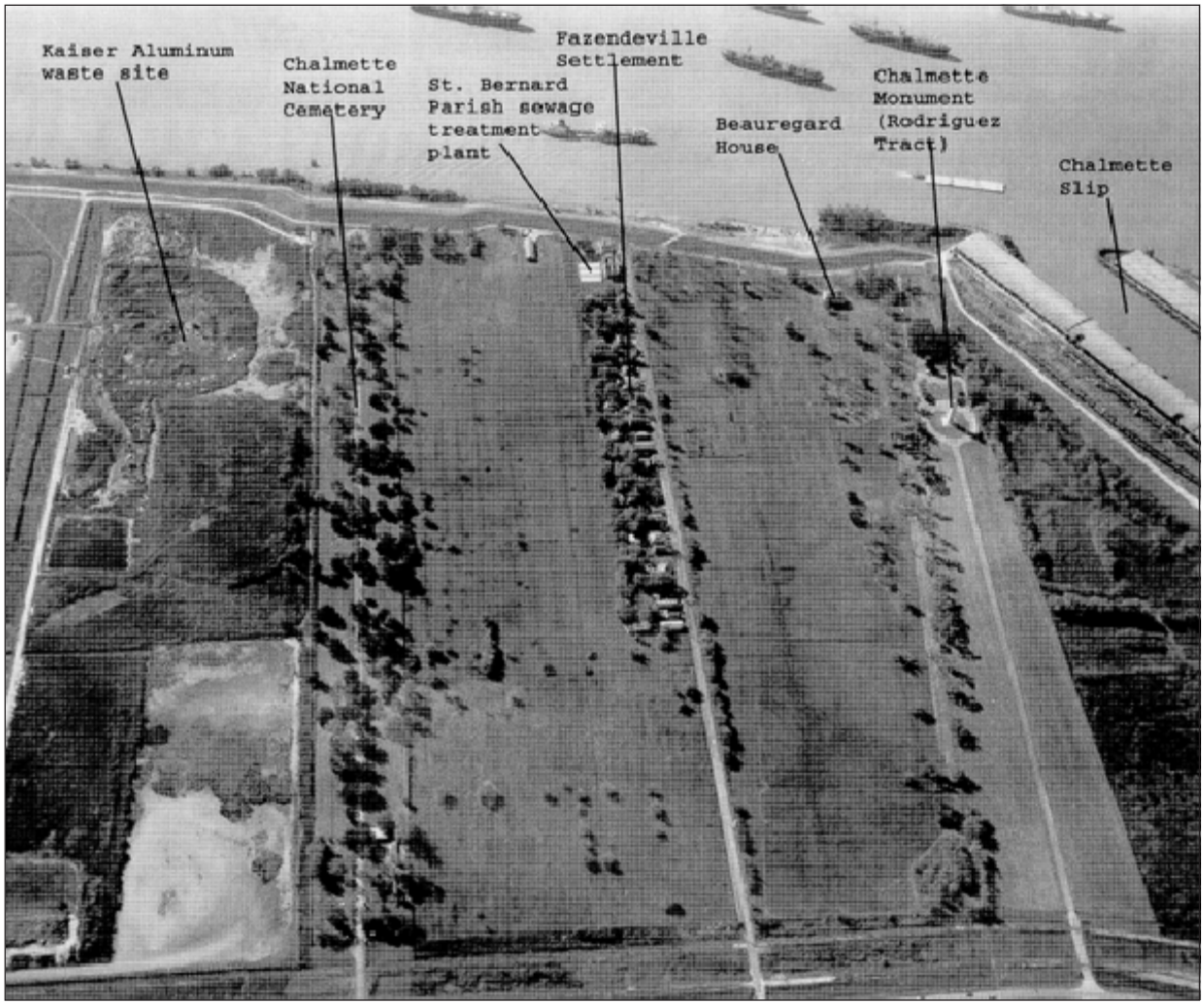


Figure 9. 1960 aerial photograph of the park showing Fazendeville (Risk 1999).

St. Bernard Highway, paved the monument circle, and built two parking areas. In 1964, the park built the tour road and completed the reconstruction of Line Jackson. The park built a new comfort station in 1972 and completed a new parking lot and visitor center in 1983. In 1978, Chalmette National Historical Park was incorporated into Jean Lafitte National Historical Park and Preserve.

Chapter 4

PREVIOUS ARCHEOLOGY

CHALMETTE BATTLEFIELD ARCHEOLOGY

Chalmette Battlefield has a rich history of archeological investigation and debate. The first archeological testing at Chalmette took place in 1957 when Francis H. Elmore, NPS, conducted testing along the Rodriguez Canal (Birkedal n.d.). Elmore dug four trenches in an attempt to locate information for interpretation at the park. These trenches did not produce any evidence of the canal. He also reportedly attempted to use a mine detector (an early type of metal detector) to locate artifacts, again with negative results.

In 1963, Southeast Regional Archeologist Rex Wilson (1963) conducted an archeological investigation of the area where Line Jackson had stood during the Battle at Chalmette. Wilson conducted his work south of the main park entrance where the earthen reconstruction currently stands. He used two data recovery techniques. The first was metal detecting and the second was mechanical trenching. The metal detecting was undertaken by a single individual using a "modern army mine detector" (Wilson 1963:4). The machines generally did not have the ability to detect objects deeper than 4-6 inches below the surface (Randy Slater personal communication). Given the limitations of the machine, the long term plowing of the fields and the fact that only one person was used, it is surprising that even one battle-related object, a cannonball from a six-pounder, was recovered.

Using a backhoe, Wilson excavated four trenches, each measuring 200 feet long, 2 feet wide, and between 2 ½ and 3 feet deep (Wilson 1963:5). In the S30 trench, 26 inches below the surface, a cypress log measuring 10 feet 10 inches in length and 14 inches in diameter (Figure 10) was recovered (Wilson 1963:5). This log was located within 10 feet of where the cannonball was recovered.

Figure 10. South end of the cypress log recovered by Wilson (1963).

Wilson interpreted this as the location of Line Jackson, or as Wilson referred to it, the Mud Rampart.

Evidently Wilson believed he was near Battery Number 8, because at the time of this report it was believed that the river had removed a large portion of the battlefield. Recent interpretations, such as Birkedal (n.d.), have shown conclusively the battlefield has not been significantly eroded by the flow of the Mississippi River. When the location of the cypress log is reinterpreted, it falls near Battery Number 5. This battery contained the two six-pounders that Jackson's army employed. Wilson suggested that the cannonball "…could have been dropped in the heat of battle and trampled into the mud by American gunners" (Wilson 1963:8). Given that he was unknowingly in the location of Battery Number 5, Wilson speculations become almost prophetic in that Battery Number 5 consisted of two six pounder cannons.

Rex Wilson returned to Chalmette in 1964 in an attempt to locate the British mass graves, now known to have been at Bienvenue plantation (MHRP 1941 Vol. 347, pp 291–292). His search

was centered in the northwest quadrant of the battlefield and consisted of metal detecting and trenching (Birkedal n.d.). The testing failed to produce a single period artifact. No formal report was ever produced.

In 1979, Frances J. Mathien (1979) used black and white, color infrared, and multi-spectral photography to evaluate landscape features at Chalmette. In 1980, J. Richard Shenkel (1980) conducted a ground investigation of the anomalies reported by Mathien. The linear features were interpreted as irrigation or drainage ditches. The smaller circular anomalies were interpreted as being growths of *Mimosa strigillosa*, a ground-hugging plant. The large circular anomalies remained a mystery.

In March 1983, Ted Birkedal (n.d.) excavated two test pits east of the present park comfort station in a site chosen for the new visitor contact station. This lead to the discovery of a large trash pit that contained early nineteenth century material. Birkedal conducted additional historical research and determined that these were probably from the Rodriguez House that stood on the property at the time of the battle. Local lore maintained that Rodriguez House had been eroded by the Mississippi River. Birkedal consulted the historic maps and compared them to the current bank. He found no evidence that the bank had been eroded enough to destroy the Rodriguez House.

In May of the same year, Birkedal conducted a series of auger tests in the area and soon exposed the brick wall of the Rodriguez House. A probe was used to determine the outline of the entire building. Birkedal (n.d.) indicates that he recovered a .69 caliber musket ball and a British gunflint. This is as expected given the location of the house in proximity to the British attack down the Levee Road. Another metal detector survey was conducted in the northwest section of the park. Once again, this survey did not produce any battle-related artifacts. By locating the Rodriguez House, Birkedal provided the key to determining specific positions on Line Jackson and the rest of the battlefield.

In July 1983, Birkedal (n.d.) conducted a series of auger and test pits between the Malus-Beauregard House and the St. Bernard Parish Sewage Treatment Plant. He located a section of brick and shell pavement west of the sewage plant and an old carriage road that linked the property adjacent to the Malus-Beauregard House and Levee Road.

In 1984, Birkedal (n.d.) returned to Chalmette battlefield because the Corp of Engineers was considering changing the design of the levee in the park area. His work focused on the American line and the positions of Battery Numbers 2 and 3. The work began with a magnetometer survey. Following that, each grid was to be surveyed using a metal detector. However, the metal detector survey was abandoned due to the large number of non-battle-related objects. The magnetometer results were used to guide the subsurface testing in the field. While the resultant maps from the magnetometer survey produced a large number of anomalies, test results were largely inconclusive.

On the west side of the Rodriguez canal in the southwest corner of the park, testing consisting of test pits, auger tests, and shovel tests. In Birkedal's Test Area 3, he located a filled hole that he interpreted as Battery Number 3. Birkedal believed that a filled-in hole would have been created when the cotton bales were removed from the battery and, over time soil refilled the hole. He also found wooden palings that he interpreted as the remains of the battery. Birkedal's research indicated that the river has removed about 200 feet of the battlefield not the 1000 feet traditionally believed to have been lost. This new interpretation suggests that the batteries along the reconstructed earthworks are placed in the wrong locations and the actual battery locations have not been impacted by park construction and may be preserved for future researchers.

In 1990, R. Christopher Goodwin and Associates Inc. conducted additional testing in the Battery Number 3 area near the Rodriguez Canal. It was their conclusion that the wooden palings located in 1984 (Birkedal n.d.) were the remains of nineteenth to twentieth century fences and that the Goodwin survey located no evidence of Line Jackson (Goodwin et al. 1991:ii). Goodwin also argues that Battery Number 3, as determined by Birkedal,

was a large filled hole with no evidence of the battery. The authors recommended that search for Line Jackson be deemphasized.

In 1993 and 1994, archeological monitoring was undertaken for the installation of a fire suppressant line. The line began southeast of the Malus-Beauregard House, ran behind the house, turned north on the west side of the house, crossed the Rodriguez Canal near the restrooms, and turned north in the parking lot area. Wooden palings similar in alignment and type to those found by Birkedal (n.d.) were recorded (Yakubik et al: 2001). Yakubik also reported the recovery of a 2.36-inch iron canister shot (Yakubik et al: 2001). The authors of this report felt that evidence for the American Line was compelling and that the search should continue.

In 1998, two archeological technicians from SEAC conducted testing around the maintenance building in the northeast corner of the park prior to the installation of a subsurface utility line (Jones 1998). They dug shovel tests and monitored the trenching by a ditch-witch. A brick walk, probably dating to 1929, was discovered.

BATTLEFIELD ARCHEOLOGY

Archeologists have been using metal detectors for as long as the machines have been available. Unfortunately, during much of this time the machines and operators have not been effective for archeological pursuits. This is clearly evidenced by the previous attempts with metal detectors at Chalmette (Wilson 1963, Elmore in 1957, and Birkedal n.d.) and poor results obtained. With such a lack of success many archeologists dropped metal detecting as an archeological collection technique. Other archeologists refuse to use metal detectors based on a concern that the public would link them with looting activity as well as weaken arguments against allowing open detecting in parks.

While use of metal detectors on archeological sites has been a story of many failures, the number of successes has grown as archeologists developed an appropriate methodology. Projects that stand as milestones in development of the methodology begin in 1972, when Dean R. Snow demonstrated the archeological data potential of battlefield archeology (Snow 1981). In his work for the National Park Service at the Saratoga Battlefield, he discarded traditional archeological techniques and chose instead to use aerial photographs, magnetometers, and soil probes to locate battlefield positions. His work showed that there was an enormous historical and cultural data potential in the battlefields preserved by the National Park Service.

In 1973, Roy S. Dickens, Jr. conducted an archeological investigation at Horseshoe Bend National Military Park that included a systematic sweep using metal detectors (Dickens 1979). During the survey, 11 artifacts that related to the battle were recovered. These include "…lead rifle balls, three iron grape shot, and two iron cut nails" (Dickens 1979:26). The Dickens work shows that even as far back as the 1970s, acceptable results could be obtained using metal detectors. However, the archeological literature is virtually devoid of successful metal detecting surveys on battlefields for another decade after Dicken's work.

In 1984, at Little Bighorn Battlefield, Dr. Douglas Scott and Richard Fox showed the effectiveness of using metal detectors and volunteers to obtain information about battlefields (Scott and Fox 1987). Based on the results of their testing (Fox and Scott 1991) these researchers later described a post-Civil War battlefield pattern. The identification of the pattern began with the determination of individual actions based on the distribution of artifacts with unique signatures or characteristics (e.g., rifling patterns on bullets, ejector marks, or firing pin marks). These individual patterns were aggregated into unit patterns, which in turn formed the battlefield pattern. In describing the essence of battlefield archeology, Fox and Scott (1991:97) write "tactics prescribe combat behavior. All cultures have combat tactics, some more rigidly defined than others. In the absence of unit tactical disorganization, signature patterning may reflect prescribed deployment."

The soldiers of the battle at Chalmette used two types of guns: muskets and rifles. The individual weapons, however, did not produce artifacts

with unique signatures. This makes determination of individual movements extremely difficult, if not impossible, on most Civil War and earlier battlefields. Therefore individual actions must be deduced from artifact patterns understood as unit actions.

One method used to compensate for the lack of unique bullet signatures was illustrated by William B. Lees (1992). His study of the Mine Creek Battlefield led him to conclude that "unfired" or "dropped" bullets provide the best basis for reconstructing troop positions because they mark the precise location of individuals. Concentrations of fired bullets falling behind unit positions are most likely indirect indicators of lines, and thus represent a "ghost" of those positions (Lees 1992:8).

In 1992–93, Charles M. Haecker and Jeffery G. Mauck conducted research at Palo Alto Battlefield National Historic Site (Haecker and Mauck 1997). This research on the U.S.- Mexican War battlefield showed the effectiveness of using historic maps to guide the archeological testing.

Archeological metal detector surveys have been conducted on battlefields from virtually every time period of American history. These include Revolutionary War battles of Guilford Courthouse (Cornelison 1995c), Ninety Six (Russell 1998), the 1795 war against the Ohio Confederacy (Pratt 1995), the Red Stick Wars (Dickens 1979), the American Civil War battles of Stones River (Cornelison 1995a) and Chickamauga (Cornelison 1995b), and the Indian Wars (Scott and Fox 1987).

Chapter 5

TESTING

GIS AND GPS MAPPING

Prior to the beginning of the survey, CRGIS compiled all of the available maps in electronic format. The composite map—consisting of a modern base map and two versions of the Latour battle map (Figure 11)—was used to select the survey areas. Since each map was slightly different based on the map version, there was no accurate way to determine precisely where the attack took place. The CRGIS composite map used common features on all maps to rectify them for electronic digitization. The CRGIS map used the area of overlap and knowledge of seventeenth century weapon

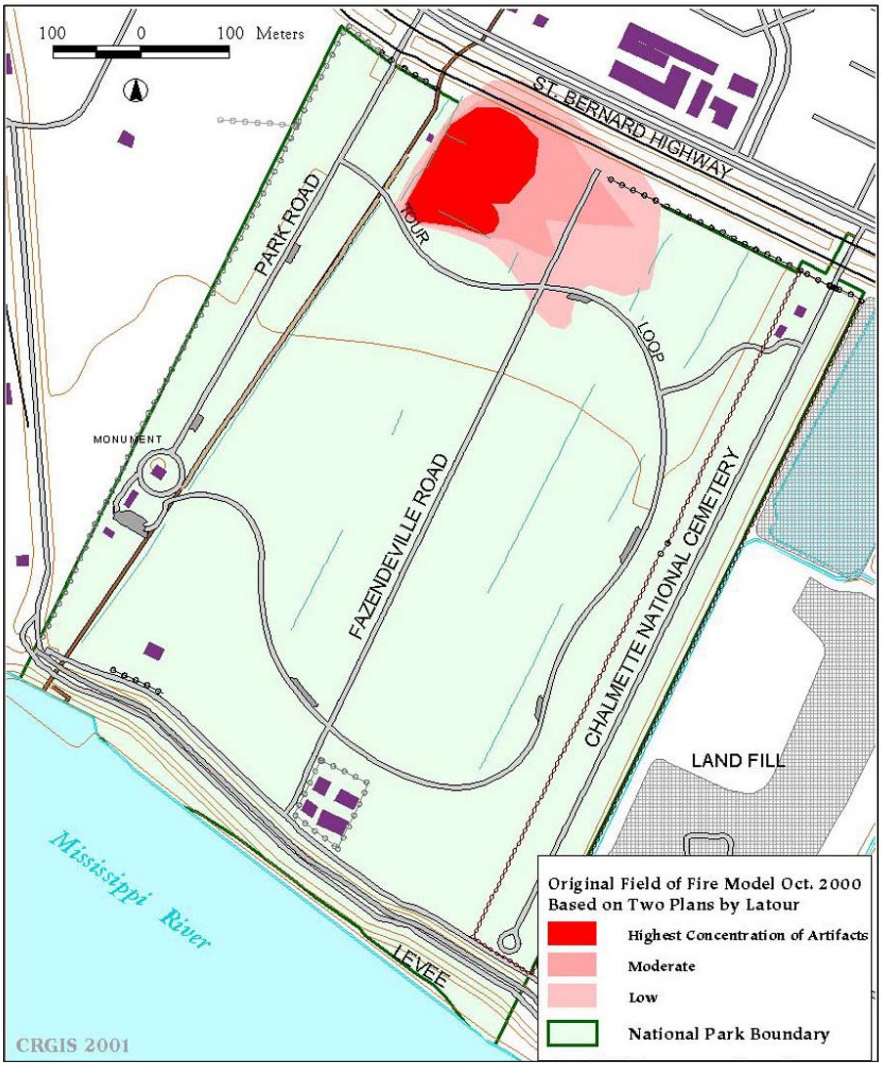


Figure 11. Fields of fire and current park features and Latour battle map.

to produce three polygons with the darkest area representing the area where the greatest concentration of artifacts would be located. The two other polygons represent expected moderate and low concentrations of artifacts. Based on the composite map, it can then be assumed, if the maps are reasonably accurate, that the darkest area was the most likely location of the British attack on the north end of Line Jackson. The metal detector survey was begun in the area of greatest overlap, thus maximizing the survey effort.

All metal detecting hits, shovel tests, GPR results, and major park features such as roads, walls, and buildings were recorded using GPS. The GPS unit employed consisted of a Trimble Pro XRS and a TSC1™ data collector. These units are capable of receiving a real time correction beacon transmitted by the U.S. Coast Guard. The unit is horizontally accurate to 50 cm on a second-by-second basis, and to 20 cm after 10 minutes of tracking satellites for phase processing.

CRGIS provided professional GPS operators to record the location of all recovered artifacts, datums, primary landscape features, and GPR transects (Figure 12). They worked concurrently with the metal detecting survey so that all artifact locations were generally recorded by the end of each day's testing. CRGIS merged the GPS data into ArcView GIS in order to create maps for this report. The data was collected in real-time using the USCG radio signal. Two datums located 100 m apart in the open field to the east of the reconstructed Line Jackson were recorded using the GPS decimeter processing function which provides location accuracy within 10 cm. These datums were used to align the transit to the grid (Figure 13). The transit readings taken from these datums will be compared with the GPS coordinates to determine the margin of error produced by GPS as compared to a transit. The results will be discussed in Appendix C.

Figure 12. David Lowe collecting GPS data in the wooded area at the north end of the park.

Figure 13. Charles Lawson using the Sokkia laser transit to record artifact locations.

SHOVEL TESTING

Prior to the beginning of the survey, the Park bush-hogged the overgrown field in the central area of

the park inside of the tour road. In order to demonstrate the effectiveness of metal detecting, a scientific control was needed. Systematic shovel testing on a 20-meter interval was the method chosen since it is a method typically used by archeologists to locate sites. All shovel tests were 30 cm in diameter and dug to sterile soil. The soils from each test were screened through ¼-inch mesh hardware cloth. All artifacts recovered were placed in ziplock bags and assigned a field specimen (FS) number based on their provenience.

METAL DETECTOR SURVEY

Members of a local volunteer metal detector club and volunteers from two non-local clubs who have previously assisted SEAC on similar projects, provided the detecting skills for the survey. The volunteers recovered the artifacts under the supervision of NPS archeologists and park personnel. Uniformed park personnel were present during all of the metal detecting in order to demonstrate to the general public that this was a sanctioned activity.

Metal detectors, in the hands of skilled operators, can provide information on military sites such as battle lines, dismount areas, and camps. During the metal detector survey, once an artifact was located and recovered, it was bagged and assigned a metal detector (MDET) number by an archeologist. Survey pin flags, labeled with the MDET number were placed where each artifact was recovered. Both during and following completion of the survey, the pin flags, as well as other items of interest, were recorded using the Global Positional System (GPS) and an electronic transit. At the end of each day a FS number was assigned to each provenience (Figure 14).

EXCAVATIONS

One excavation unit was opened just west of the Freedmen's cemetery where both the GPR and thermography detected anomalies. In addition, three trenches were opened with a backhoe. Two trenches were located in the field east of the reconstructed earthworks to examine the soil of the battlefield. The third was located to the west of the reconstructed earthworks to test a series of promising GPR anomalies.

REMOTE-SENSING

SEAC contracted a GPR operator to assist in the battlefield investigations for three days. In that time, 85 transects of varying lengths were recorded in areas such as the Rodriguez Canal, possible gun emplacements, the presumed earthworks, a Civil War earthworks, a Civil War powder magazine, and the presumed location of the Freedmen's Cemetery. The operator returned the printed output with marks indicating anomalies and disturbances and CRGIS recorded their location by GPS.

A thermography unit was employed gratis by a local archeologist, Jill-Karen Yakubik and Bob Melia, in an attempt to locate the British mass burials. Several anomalies were recorded and one was tested with an excavation unit. However, documents maintained by the park indicate that these burials are located well out of the park and the testing did not produce the predicted grave or any other cultural features. The archeologist who oversaw the thermography survey will cover the results in a separate report.

Figure 14. The crew in the Malus-Beauregard House recording field specimen bags.

Chapter 6

MATERIAL CULTURE

SHOVEL TESTING RESULTS

The shovel test survey consisted of a series of 221 shovel tests excavated at 20 m intervals on a grid oriented with magnetic north (Figure 15). The shovel tests were strategically placed to concentrate the coverage in the northwest quadrant of the park, where the literary search and the CRGIS composite map suggests that the majority of the battle action took place. Two of the shovel test transects crossed the entire width of the park in order to retrieve a broad view of the stratigraphic record across the park, in addition to the search for archeological deposits.

The two long transects were on the south side of the grid. The west end of the southernmost transect was located on the park's western boundary approximately 475 m from the northwest corner of the park. From this point, this transect and the transect 20 m to the north could be extended due east across the entire breadth of the park without traversing the wooded area at the north end of the park. The remainder of shovel test transects were laid out to the north at 20 m intervals with the lines becoming progressively shorter. The shovel testing grid extended to the western boundary fence, to the northern boundary fence, to the edge of the wooded area, and east to Fazendeville Road. Grid positions located on the modern tour road or the reconstructed rampart were not excavated and not given a number.

The shovel test units were 30 centimeters (cm) in width and were excavated to a culturally sterile depth or until the unit was terminated due to large blockages of rocks or gravel. The material removed was sifted though a ¼-inch mesh hardware cloth and all cultural materials were collected.

The shovel testing, which covered 15 percent of the park acreage, provided invaluable information to the project. A large amount of cultural material and an abundant amount of information concerning stratigraphy were collected. While many of the artifacts, such as cut nails and ceramic vessels were expected, based on previous battlefield surveys undertaken by SEAC, it was also predicted that no conclusively battle-related material would be recovered by shovel testing. This was indeed the case.

While the artifactual data collected during the shovel testing will prove valuable to the park resource managers, the most significant contribution of the shovel testing was the cross-sectional view of the stratigraphy across the central portion of the park. It revealed that in the large open field to the east of the reconstructed rampart the ground surface elevation and subsurface stratigraphy has changed little since the time of the battle. This is remarkable since the area was intensively cultivated in the first half of the nineteenth century and then underwent residential development in Fazendeville in the late nineteenth and early twentieth centuries.

From approximately 0–6 cm below the ground surface (bgs) there is a very dark grayish brown (10YR3/2) silty clay loam, rich in organic materials. From approximately 6–50 cm bgs there is a dark grayish brown (10YR4/2) silty clay mottled with small concretions of dark yellowish brown material. And from approximately 50–140 cm bgs there is a gray (10YR5/1) clay muck, which was highly compacted and very moist. The water table at the time of the investigation was encountered at roughly 140 cm bgs.

The area west of the reconstructed rampart is highly disturbed, mostly due to twentieth century activities. From just west of the reconstructed rampart to the west side of the modern tour road there are several areas with lenses of brownish yellow (10YR6/8) sand. This sand was brought in to be used as sterile fill during the park service era. The

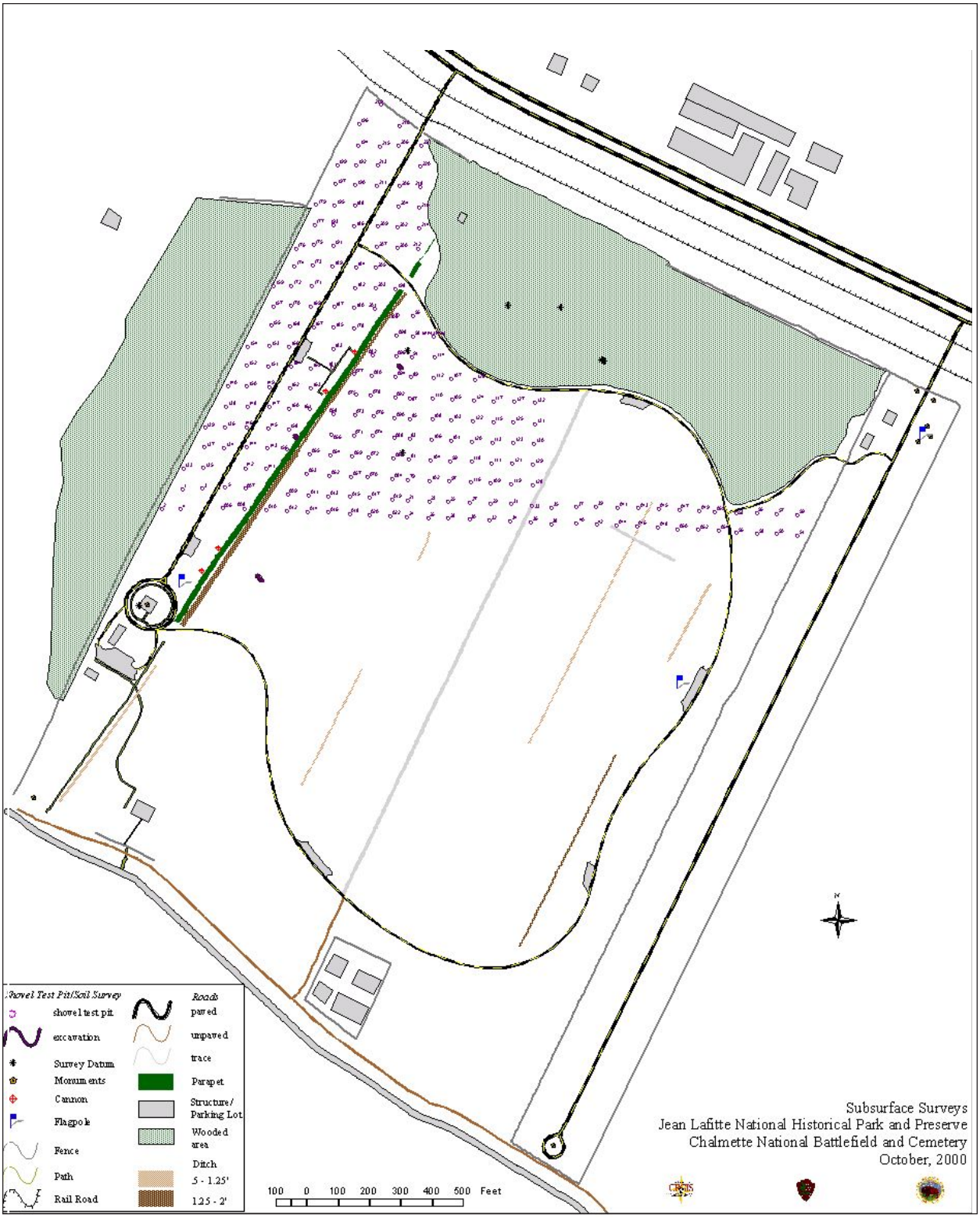


Figure 15. Locations of shovel tests.

sand lenses ranged in thickness from 5–25 cm. In addition, the area between the modern tour road and the western boundary of the park had deep areas of disturbance, largely concentrated in the southern portion of that area. The disturbances were often deep, up to 65 cm bgs and were characterized by a very dark grayish brown (10YR3/2) matrix with both historic and modern artifacts throughout. Bricks were common in the shovel tests and a large piece of road asphalt showed up in some test at about 60 cm bgs.

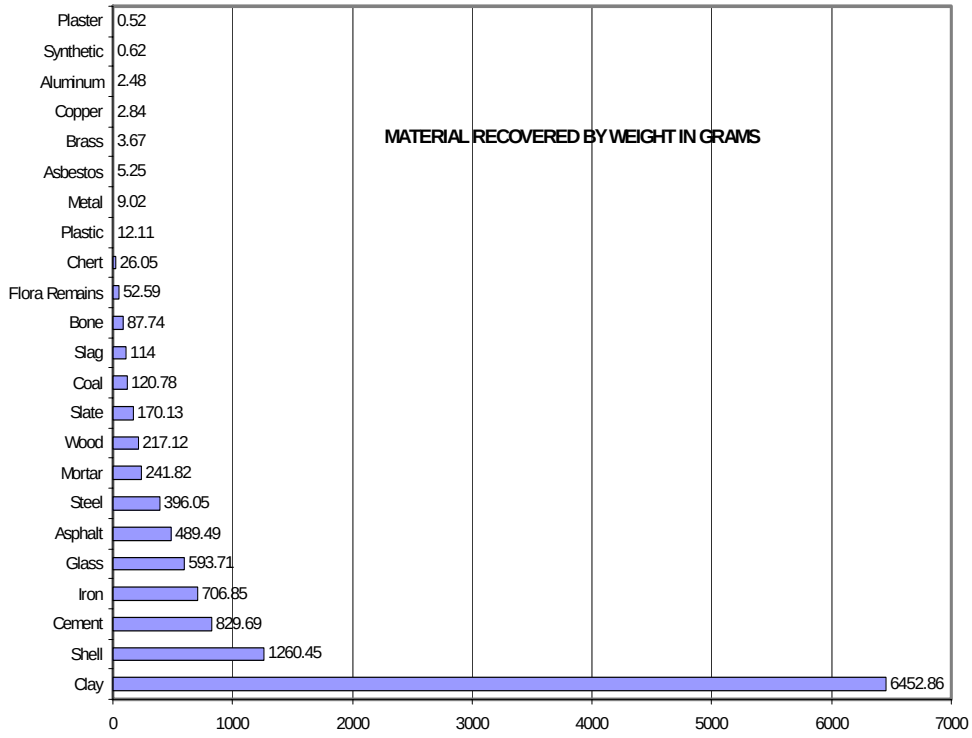
Artifacts Recovered from Shovel Tests

Of the 221 shovel tests excavated, 69 (31 percent) of them produced material culture remains. From the wide array of items, only three types of artifacts recovered have manufacture date ranges that might link them with the War of 1812 era. These three artifact types are machine cut nails, pearlware ceramics, and salt glazed stoneware ceramics. Manufacture of machine cut nails began around 1790. Even though they are still available today, their common use ended ca. 1870 with the advent of cheap, mass-produced wire nails. Pearlware ceramics were common from around 1780 to around 1830. The salt glazed stoneware ceramics were common in the eighteenth and nineteenth centuries. Regardless of the fact that these three artifact types were available to the people who were present at the battle, it seems highly unlikely that artifacts came to rest at Chalmette as a result of the War of 1812 battle. While the material recovered from the shovel tests will not be useful in interpreting the battle, they are helpful in understanding the use of the Chalmette property over time.

The shovel test survey recovered over 560 artifacts with a total weight of 11,795.84 g. There were 23 types of materials identified as a result of testing (Table 2). Table 2 shows the material types by weight.

The National Park Service's cataloging system separates materials into five major divisions: mineral, animal, vegetal, human remains (of which none were located), and unidentified material. For

Table 2. Material Recovered From Shovel Tests (grams).



the purpose of describing the artifacts recovered in the shovel test survey, the five divisions of material types will be used as the organizing framework.

Mineral

The mineral division contains seven material types: stone, ceramic (fired), clay or mud or soil (unfired), metal, glass, synthetic, and other mineral materials. As seen in Table 2, clay (fired) was by far the predominant material type that was recovered in the shovel test survey. The material type clay represented 6,452.86 g of the total 11,795.84 g. However, 6,118.27 g are attributed to brick fragments, 215.54 g to ceramic vessel fragments, and 54.15 g to one clay tile fragment. The brick fragments were predominantly high-fired red brick. Concentrations were found along the western boundary of the park, but for the most part, brick was present throughout the project area. Within the ceramic vessel fragment category there were 7 pieces of pearlware weighing 23.07g, 18 pieces of whiteware weighing 70.99g, 3 pieces of salt glazed stoneware weighing 71.79 g, 7 pieces of porcelain weighing 19.92 g, and 2 pieces of Native American coarse earthenware weighing 2.75 g.

The second highest material type in the mineral division was metal. Metal represented 1,234.91 g of the total 11,795.84 g. There were 7 types of metals identified during the analysis of the artifacts: iron, steel, brass, copper, aluminum, unidentified metal, and slag. Iron artifacts represented 706.85 g of the 1,234.91 g of metal including 132.35 g of unidentified fragments. There were 28 cut nail fragments weighing 128.57 g and 14 indeterminate nail fragments weighing 39.53 g. The remainder of the iron objects recovered, weighed 174.36 g and, appear to post-date the battle. These included a screw, a nut, a washer, a fence staple, and a horseshoe that weighed 112.7 g. The remainder of the metal artifacts also appeared to post-date the battle (Table 3).

The third largest material category in the mineral division is the general category other mineral materials. These constituted 1,077.28 g of the total 11,795.84 g. There were four material types that fell into this division: concrete fragments weighing 829.69 g, 1 piece of mortar weighing 241.82, 5 fragments of asbestos tile weighing 5.25 g, and 1 piece of plaster weighing 0.52g. These artifacts are also classified as building components and also appear to significantly post-date the battle.

Table 3. Other Metal Items Recovered During Shovel Testing.

Object	Material	Cnt.
Cap, bottle	Aluminum	1
Case, cartridge	Brass	1
Shell, shotgun	Brass	1
Grommet	Brass-Plastic	3
Sparkplug	Clay-Aluminum-Steel-Copper Alloy	1
Screw	Copper Alloy	1
Ring	Copper	1
Screw	Ferrous Metal	2
Tap	Ferrous Metal	1
Furnace pipe	Iron-Copper Alloy	1
Wire	Metal	5
Shell, shotgun	Plastic-Brass	2
Slag	Slag	1bag
Nail	Steel	71
Staple, fence	Steel	8
Wire, barbed	Steel	10

The fourth largest material type in the mineral division was glass, representing 593.71 g of the total 11,795.84 g. Vessel fragments, including fragments of a bottle, comprise 583.54 g of these 593.71. The remaining 10.17 g of glass was identified as windowpane. There was a wide variety of glass recovered, however, all the glass recovered in the shovel test survey appeared to be of twentieth century origin.

The fifth largest material type in the mineral division was synthetic. Synthetic artifacts had a combined weight of 499.35 g, 489.49 g of which were asphalt road fragments. The remainder were plastic fragments and a piece of an asphalt shingle. These materials are definitely twentieth century artifacts.

The smallest category in the mineral division was stone, consisting of 316.96 g of the total 11,795.84 g. Slate shingles (170.13 g) and coal fragments (120.78 g) comprised the majority of the stone. There were also four pieces of chert, but they appeared to have been introduced in the twentieth century with the road gravel.

Animal

The animal division contains six material groupings: shell/coral/crustacean, bone/ivory/teeth/turtle shell, antler, hide, feather, and other animal materials. Shell was the second largest of the animal group at Chalmette. Shell had a combined weight of 1,260.45 g. All were classified as food byproducts, and identified as 58 pieces of Eastern Oyster (*Crassostrea virginica*) that weighed 1064.32 g, 4 pieces as Northern Quahog (*Mercenaria mercenaria*) that weighed 21.76 g, and 22 pieces of indeterminate Bivalvia that weighed 155.26 g. There was also 19.11 g of shell fragments that were identified as Gastropoda.

The only other material type in the animal division recovered in the shovel test survey was bone. There were a total of 42 bone artifacts that weighed 87.7 g. In this group there was one single component, four-hole button that weighed 0.69 g. The remainder of bone material recovered in the shovel test survey was classified as food bone. The bones were fragmentary and could only be identified to the class level. These consisted of 38 pieces of mammalia bones weighing 84.3 g, 2 pieces of testudines (turtle) bones weighing 1.71 g, and 1 piece of vertebrata bone weighing 1 g.

Vegetable

The vegetal division contains five material types. These material types are wood, fiber, reed, paper and other plant materials. Wood fragments were recovered in only two of the shovel test units. The wood fragments have a combined weight of 217.12 g. The wood appeared to be fairly modern cut lumber. The only other artifact type representing this division is also placed under wood for material type. This is charcoal and a total of 52.59 g were recovered in 9 shovel test units.

Conclusions

In summary, the shovel test survey recovered a large amount of material culture remains. None of these artifacts could be directly attributed to the battle. In fact, the vast majority of artifacts appear to significantly post-date the battle. Nonetheless, the data gathered from this portion of the survey is a very important part of the archeological record and provides information on park land use for the interpreters and managers.

METAL DETECTING RESULTS

Of all of the methodologies employed at Chalmette, the metal detector was by far the most effective for producing War of 1812-era material. The metal detecting also produced evidence of Civil War era and more recent eras. A total of 393 artifacts weighting 23,730 g were recovered.

War of 1812 Era Artifacts

Buckshot

Forty-two lead buckshot were recovered during the metal detector survey. Thirty of these (71 percent) had been fired. The caliber was only recorded for the unfired buckshot due to problems with obtaining accurate measurements on deformed rounds. A linear regression formula was used to estimate the caliber of the fired buckshot based

Figure 16. Buck and ball load.

on weight (Sivilich 1996). According to the formula the diameter in inches (caliber) is equal to 0.223204 multiplied by the weight in grams to the 1/3 power. The resulting calculations were within approximately one hundredth of an inch of the measured calibers for the unfired balls. Based on the comparison of the measured and calculated calibers for the unfired balls, it is assumed that the calculations for the fired balls accurately represent the pre-fired calibers of these balls.

The non-fired buckshot ranged in size from 0.27 to 0.33 inches in diameter (Table 4). For military purposes, three buckshot are loaded with one musket ball to form a buck and ball round (Figure 16). This type of round worked like a shotgun, increasing the chances of hitting an enemy. The American army had been using buck and ball loads since the American Revolution and during the War of 1812 it was the standard issue musket load (Thomas 1997:104).

Musket balls

Twenty-nine musket balls were recovered during the metal detector survey (Figure 17). Nineteen of these (66 percent) were fired. The caliber of the musket balls ranged from 0.504 to 0.69 inches in diameter (Table 5). One musket ball has a hole caused when the jammed round was removed from a musket.

Although there were American Civil War activities at Chalmette, the context of the recovered musket balls, indicates that they date to the War of 1812 battle. The April 1862 Civil War engagements that took place at Chalmette were between Union gunboats on the Mississippi River and Confederate Soldiers on land. The gunboats fired grape and canister shot at the Confederates on land and given that over half of the recovered musket balls were fired (i.e. they were not dropped by Confederate troops), there is little doubt that they belong to the War of 1812 era.

Musket balls greater that 0.65 were generally presumed to be fired from the British Brown Bess (Neumann 1967, Muller 1977). Musket balls in the ranges below 0.65 caliber are presumed to be from American or French guns.

Table 4. Buckshot Recovered During the Metal Detecting Survey.

Name	Condition	Caliber	Cnt.
Buckshot	Fired	—	30
Buckshot	Unfired	0.270	1
Buckshot	Unfired	0.280	4
Buckshot	Unfired	0.284	1
Buckshot	Unfired	0.285	1
Buckshot	Unfired	0.305	1
Buckshot	Unfired	0.307	1
Buckshot	Unfired	0.320	2
Buckshot	Unfired	0.330	1

Table 5. Musket Balls Recovered During the Metal Detecting Survey.

Name	Condition	Caliber	Cnt.
Ball, musket	Fired	—	19
Ball, musket	Unfired	0.50	1
Ball, musket	Unfired	0.58	1
Ball, musket	Pulled	0.64	1
Ball, musket	Unfired	0.64	4
Ball, musket	Unfired	0.69	3

Figure 17. Examples of musket balls recovered during testing.

One lead ball fell in size between buckshot and musket balls. This single lead shot is the only one that can definitely be classified as rifle ammunition.

Cannon balls

Three 3-pound cannonballs were recovered during the metal detector survey (Figure 18). All of the cannonballs were solid and made of cast iron. This type of round was fired from a smooth bore cannon. Solid cannon balls were fired at personnel and enemy artillery pieces. It is not the type of round that would have been fired from a Civil War ship, because naval cannons generally fired grape and canister shot at infantry positions.

Figure 18. Three-pounder cannon balls recovered during testing.

Case shot

Two fragments of spherical case shot were recovered. The cast iron shells usually contained powder and a number of lead or iron balls. When the round was fired, the fuse was lit and hopefully timed to explode over the enemy, thus raining the shrapnel and shot downward. This type of round was employed from the American Revolutionary War onward.

Other

A lead disk bent in half was recovered during the metal detecting (Figure 19). Lead was often employed in this manner to replace the leather holding the gunflint in the jaws of a musket. Although bent lead holders have been located on early Civil War era sites they were more prevalent in earlier wars before percussion caps replaced the flint and powder pan.

Figure 19. Bent lead gunflint holder.

One of the most interesting artifacts recovered was a pewter naval button (Figure 20). The button was gilt and has a small patch of solder where the eye was attached. Pewter buttons with a wire shank embedded in solder were manufactured in the United States from 1800 to the 1830s and in Britain from 1780 to 1855 (Hughes and Lester 1993:221). The button is in very poor condition with a great deal of pitting on the surface. However, on the front, a border with a fouled anchor

Figure 20. War of 1812 military button.

and a rope can just be made out. The cross bar of the anchor appears to be canted to the left side of the wearer. The back of the button has letters around the outer edge but they cannot be read due to pitting. The U.S. naval buttons of ca. 1812 to 1825 had an upright anchor with a plain border and cable edging and the words "Treble Gilt. Standard." On the back (Hughes and Lester 1993:718). British sailors (Albert 1976:88–90) wore similar buttons. A similar button illustrated by Albert has a date of 1761 to 1807 (1976:88–89). Based on the location where the button was recovered, it is likely that it was from the uniform of one of the 52 American U.S. Marines (Pickles 1998:37) that took part in the battle as the British Marines were active only in the west bank action.

A plain brass gilt button with two-piece face was also recovered. The button does not have any lettering and is severely pitted. The wire shank embedded in solder indicates a type of button manufactured in the U.S. from 1800 to the 1830s and in Britain form 1780 to 1855 (Hughes and Lester 1993:221). Based on the date of the shank and gilt, this button is most likely a War of 1812 military button.

Another interesting item recovered was a sword scabbard holder (Figure 21). The loop, which is much too small to be from a rifle or musket, was placed around the outside of a sword scabbard. The wearer's belt was threaded through the upper buckle, thus supporting the sword.

Figure 21. Sword scabberd holder.

Civil War Era Artifacts

Many Civil War era artifacts were recovered during the metal detector survey. This was quite a surprise. Although it was known that the Confederates manned the earthworks located in the area that became the National Cemetery and that they were shelled during the attack on New Orleans in 1862, it was not expected that the campsites were located so close to the position the Americans had held some 47 years prior.

Minié Ball.

The signature artifact of the Civil War is the Minié ball (Figure 22). The name is often confusing to people because the Minié ball is neither small nor a ball-shaped round. It was designed in 1849 by Frenchman Captain Claude Minié (Thomas 1997:3). The bullet is conical, generally with 3 rings and an expanding base. The bullets were adapted by the U.S. Army in 1855 and were largely obsolete by the end of the Civil War in 1865.

Seven Minié balls were recovered during the metal detector survey. One of these (14 percent) was fired. The caliber ranged from 0.52 to 0.58 inches (Table 6). The single fired round most likely came from practice or an accidental discharge of the firearm, since there were no known Civil War land battles in the Chalmette area.

Figure 22. Examples of Minié balls recovered during the survey.

Table 6. Minié Balls Recovered During the Metal Detecting Survey

Name	Condition	Caliber	Cnt.
Bullet, Minié	Fired	—	1
Bullet, Minié	Unfired	0.52	1
Bullet, Minié	Unfired	0.54	1
Bullet, Minié	Unfired	0.56	3
Bullet, Minié	Unfired	0.58	1

One conical artillery shell fragment was recovered (Figure 23). This type of shell was not used during the War of 1812 and is therefore almost certainly a remnant of the Union naval bombardment during the attack on New Orleans in 1862. Based on the shape of the fragment it is most likely a Hotchkiss shell (Dickey and George 1993:158–180) fired from a rifled cannon off one of the Union gunboats.

A brass Union Fifth Corps badge was also recovered (Figure 24). The badge has the Maltese cross in the center with a braided chain around the outside. The badge had four holes where it could be attached to a larger medallion. Four brass links were also recovered in association with the badge.

One brass button back and shank that probably dates to the Civil War was recovered. The two piece Sanders type had a bent wire shank that was soldered on both the inside and outside. This type of design was made between 1830 and 1850 and as late as the 1930s on high quality uniforms (Hughes and Lester 1993:221). There is no writing on the back. The design of the button is similar to many buttons recovered from Civil War battlefields by the authors, but without a crown it is impossible to tell if it was military or civilian.

Several fragments of a brass or bronze canteen were recovered (Figure 25). The top of the spout was intact. The spout had an inside diameter of 17.4 millimeters (mm) and an outside diameter of 24.2 mm. This type of canteen would have been very rare on a War of 1812 battlefield because of the expense of hand manufacturing. Also the majority of canteens used by Americans in the War of 1812 were constructed of wood. European troops preferred tin canteens while Americans favored wood (Neumann and Kravic 1992:59). Based on the examples presented in Crouch (1995:146–148) the fragments found at Chalmette are similar to the U.S. Model 1858 canteen. It is presumed to be Confederate based on

Figure 23. Conical shaped artillery shell from Civil War era.

Figure 24. Civil War era 5th Corps badge.

Figure 25. Civil War era canteen fragments.

the context. Crouch (1995:148) illustrates a similar canteen and states there is evidence that they were made in New Orleans, but he fails to state what this evidence is.

Other Artifacts

During the metal detector survey numerous coins and several tax tokens were recovered (Figure 26). The total number of coins recovered was 73 (Table 7). All of these coins post-dated the battle and were American save one, a one peso coin from Mexico with a date of A.D 1975. The majority of the coins (65.76 percent) were pennies. The next largest group was the Jefferson type nickel representing over 19 percent of all coins. Two buffalo type nickels were also recovered as were five of the older Liberty head types. The oldest coin recovered was a Liberty Seated half dime that had a date of 1841.

Three tax tokens were also recovered. One is a Louisiana luxury tax token, another is a Louisiana public welfare tax token, and the third is too corroded to read.

Eight nails were recovered during the metal detector survey. Six of these (75 percent) were manufactured by machine cutting. This process began around ca. 1790 and was in common use through the Civil War. It is possible that the Chalmette nails date to the time of the 1815 battle or from earlier plantations. Two wire nails representing 25 percent of the nail assemblage were also recovered. Wire nails date from ca. 1870 (Noel Hume 1991:254) and are still in common

Figure 26. Coins and tax tokens.

Table 7. Coins Recovered During the Metal Detecting Survey.

Coin	Typology	Cnt.	%
Quarter Dollar	Washington Type	2	2.74
Peso	Un peso	1	1.37
Penny	Lincoln Type, Memorial	24	32.88
Penny	Lincoln Type, Wheat	20	27.40
Penny	Date and type indeterminate	3	4.11
Penny	Lincoln Type, date and mint indeterminate	1	1.37
Half Dime	Liberty Seated type	1	1.37
Five Cent	Jefferson Type	14	19.18
Five Cent	Liberty Head type	5	6.85
Five Cent	Buffalo-Indian Head type	2	2.74

use. Seven cut iron spikes were also recovered. Due to their long production span these objects are not useful for dating the site. Other objects related to household and agriculture are summarized in (Table 8).

Fourteen post-Civil War era non-battle related bullets were recovered (Table 9). Of this total, 2 (14 percent) were jacketed with an outer coating over the lead. The remaining bullets were non-jacketed lead. All of the calibers were small reinforcing the conclusion that they were of a non-military type.

Three brass cartridge cases were recovered. One was a center fire type while the other two were pin fire types. The round for all three cartridges was almost ½ in diameter. Based on the size of the cartridges, it is possible that they have military origins.

Two iron ax heads were recovered. Based on the design of the blades, it is most likely that these are remnants of the Fazendeville era.

As a result of the metal detector survey, several pieces of non-metal ceramics were recovered. These were most often found in association with metallic artifacts. One very old piece of olive jar was recovered. This type of ware was used in Europe prior to the colonization of North America and was probably fairly rare by the American Revolution. Two ironstone fragments were recovered. Ironstone dates from 1813 to the present (Noël-Hume 1991:132). One of the pieces has a partial maker's mark consisting of the letters "LOR." At this time, the origin of the mark has not been determined. Seven pieces of pearlware were recovered. Five of the sherds were plain and two were transfer printed. Pearlware dates from 1780 to 1830 (Noël-Hume 1991). It is possible that the soldiers who manned Line Jackson, plantation residents, Civil War era soldiers, or even Fazendeville residents who followed, could have used pearlware dishes. Three porcelain fragments were recovered. These represent the higher end of the economic spectrum and may have come from the plantation houses. Nine stoneware fragments were recovered. These represent utilitarian items and could have been used during any time period by people of any economic class. One whiteware

Table 8. Other Household and Agricultural Items.

Object	Material	Cnt.
Bar	Iron	1
Bar	Lead	2
Bolt, eye	Brass	1
Bolt	Iron	5
Bottle, Colorless	Glass	1
Brick	Clay	—
Buckle	Brass	2
Buckle	Brass-Iron	1
Buckle	Iron	5
Cap, bottle	Copper	10
Cap	Iron	1
Chain	Iron	28
Cutter, glass	Iron	1
Fixture, light	Iron	1
Food, bone	Bone-Fauna Remains	1
Grommet	Brass	1
Handle	Brass	1
Handle	Iron	4
Handle	Iron	3
Hardware	Brass	2
Hardware	Copper Alloy	2
Hardware	Iron	1
Hinge	Brass-Iron	1
Hinge	Iron	1
Horseshoe	Iron	1
Knife, butter	Stainless Steel	1
Lock	Iron-Stainless Steel	1
Marble	Kaolinite Clay	1
Mortar	Mortar	—
Nonfood, bone	Bone-Fauna Remains	1
Pintle	Iron	2
Ring	Brass	1
Rod	Iron	1
Screw	Copper Alloy	1
Sinker	Iron-Lead	1
Slag	Slag	—
Stove, wood	Iron	2
Strap	Brass	1
Strap	Copper	1
Strap	Iron	1
Strap	Lead	1
Thimble	Copper Alloy	1
Tile	Marble	1
Utensil	Ferrous Metal	1
Wedge	Iron	1
Weight, balance	Iron-Lead	1
Wire, barbed	Steel	56
Yoke, animal	Copper Alloy	1

Table 9. Non-Battle-RelatedBullets.

Typology	Condition	Caliber	Cnt.	%
Jacketed and Flat Nose (Wadcutter)	Unfired	0.34	1	7.14
Jacketed and Round Nose	Unfired	0.32	1	7.14
Non-Jacketed and Pointed (Spritzer)	Fired	—	1	7.14
Non-Jacketed and Round Nose	Fired	—	5	35.71
Non-Jacketed and Round Nose	Fired	0.19	1	7.14
Non-Jacketed and Round Nose	Unfired	0.30	1	7.14
Non-Jacketed and Round Nose	Unfired	0.30	1	7.14
Non-Jacketed and Round Nose	Unfired	0.32	1	7.14
Non-Jacketed and Round Nose	Unfired	0.34	1	7.14
Non-Jacketed and Semi-Pointed (Semi-Wadcutter)	Fired	—	1	7.14

sherd was recovered. Whiteware dates from 1820 to the present (Noël-Hume 1991). The Civil War soldiers or later residents of the area could have used it. One yellowware sherd with a dendritic pattern was recovered. Yellowware dates from 1830 to 1890 or later. In addition to the ceramics, one dark green glass fragment was recovered. This type of glass was used for liquor and wine bottles and could easily date to the time of the battle.

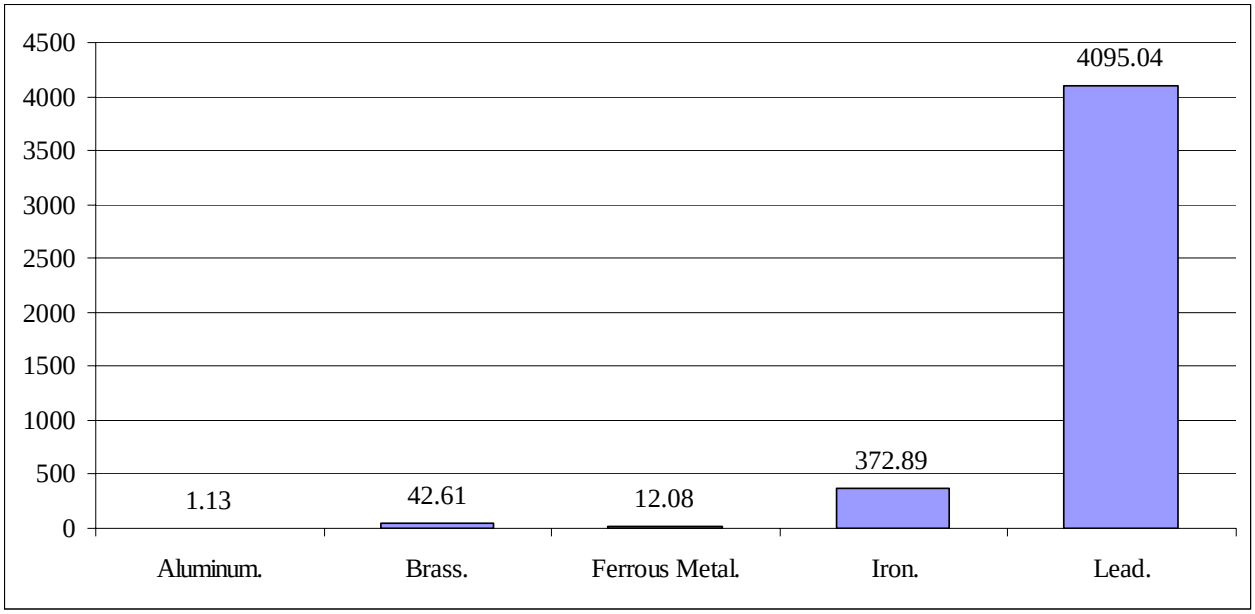
A total of 4,523.75 grams of metal fragments were recovered during the metal detecting at Chalmette. The metal fragments are divided into five groups based on their material (table 10). The largest group is lead, comprising over 90 percent of the metal fragments group. Much of the lead could presumably be attributed to the battle, although this can not be conclusively proven. The lead group includes two large chunks that were recovered near the northwest corner of the park in the area of the main attack. They may have been carried by the Americans to melt into musket balls. Several other military artifacts were recovered during the survey (Figure 27). Two modern U.S. military insignias that help to show the continuing use of Chalmette Battlefield as an area of military study and use. The first is a Specialist 4th class rank insignia that is worn on the collars and the hat of the fatigue style uniform. This artifact post dates the Korean Conflict. The second insignia is made of brass and is worn on the right collar of the dress and khaki uniforms. The insignia is made in two parts with the back being a flat disk and the front piece bearing the letters "U.S." A small sleeve button from the U.S. Army dress uniform was also recovered. Both of these artifacts are from the World War II or later era. The button is gilt and has the American eagle with a crest on its chest, a wreath for peace in its right claw, and a stave of arrows in its left claw denoting war. This configuration represents the philosophy that the United States prefers peace but remains ready for war.

Five brass rivets of various types were recovered. It is quite likely that these are of military origins and functioned to close accouterment bags and other similar items.

The remains of three pocket watches were recovered. The first is a silver colored round watch with winding screw on the top, with a leather back. The second watch is a gold colored round watch with a false winding stem on the top. The internal

Figure 27. U.S. Military insignias and button.

Table 10. Metal Fragments by Material.



movements of this watch were not present at the time of recovery. The third watch is also round and appears to be made of brass. All that remains of this watch is the cover, which is decorated with a circular rouletting and cross hatch pattern.

EXCAVATION AND MONITORING RESULTS

Excavation

Excavation Unit 1 was located west of the Freedmen's Cemetery where GPR transect 166 and thermography anomaly RTTI-32 intersected. While this area was outside of the Freedmen's Cemetery as mapped by CRGIS, it was selected because of the concurrent anomalies.

The unit was 2 m long and 1 m wide with the long edge aligned on magnetic north. The unit datum was located at the southwest corner at ground surface. The sod was removed, taking the unit down to 12–15 cm below datum (bd). The unit was excavated down to 20 cm bd as Level 2. The majority of the soils in Level 2 were a 10YR4/2 dark grayish brown clay with 10YR4/6 mottles. Artifacts recovered include ceramics, glass of various colors, brick, and cinders (Table 11). The only datable artifact from this level was a small pearlware fragment that dates from 1780 to 1830.

The soil in Level 3 was consistent with the previous level. Level 3 stopped at a depth of 30 cm bd. The artifacts recovered include a dark green glass vessel fragment, a cut nail, a wire nail, slate, cinder, and brick. The cut nail dates from 1790 to ca. 1865 (common use) while the wire nail dates from 1850 to the present.

The soil remained the same for the next three 10 cm levels that ended at a depth of 60 cm bd. The only artifacts recovered were a few grams of brick at the bottom of Level 6. Since the soil was homogeneous and there was no sign of cultural activity, the unit was abandoned at this level. A shovel test was dug into the bottom of the unit prior to back filling to insure there were no buried soil changes.

Trench 1 was located just south of the north datum on the east side of the reconstructed Line Jackson. Trench 2 was placed parallel to Trench 1 east of the reconstructed Line Jackson and north of the tour road and the Malus-Beauregard House. Trench 3 was located on the west side and perpendicular to the reconstructed Line Jackson. This area was selected because GPR transect 188 indicated

Table 11. Artifacts Recovered From EU 1.

Provenience	Name	Material	Cnt.
EU1, LV2	Brick	Clay	bag
EU1, LV2	Cinder	Coal	bag
EU1, LV2	Green glass fragment	Glass	1
EU1, LV2	Stone, building	Slate	2
EU1, LV2	Pearlware vessel fragment	Clay	1
EU1, LV2	Porcelain vessel fragment	Clay	1
EU1, LV2	Untyped vessel fragment	Clay	1
EU1, LV2	Colorless vessel fragment	Glass	1
EU1, LV2	Copper-green vessel fragment	Glass	1
EU1, LV2	Dark green vessel fragment	Glass	2
EU1, LV2	Colorless windowpane	Glass	1
EU1, LV3	Brick	Clay	bag
EU1, LV3	Cinder	Coal	bag
EU1, LV3	Food, bone-Vertebrata	Bone	2
EU1, LV3	Machine Cut Nail	Iron	3
EU1, LV3	Machine Wire Nail	Steel	2
EU1, LV3	Stone, building	Slate	1
EU1, LV3	Dark green vessel fragment	Glass	1
EU1, LV6	Brick	Clay	—

a series of anomalies along the west side of the reconstruction. The soil was not screened and no artifacts were recovered. Upper and lower soil samples were taken from each trench. In Trench 3 two samples were also taken from the north and south profiles. The soil profiles for each unit were recorded. The profiles were very consistent (Table 12), however, the north and south profile of Trench 3 differed very slightly in hue. While the meaning of this change is not clear, it does account for the GPR anomaly.

Monitoring

While the survey was underway, the park needed to replace a waterline connection at the Malus-Beauregard House. An archeologist from the crew was detailed to monitor the backhoe excavations. Two diagnostic artifacts were recovered during the monitoring (Figure 28). The first artifact is a purple transfer printed pearlware body sherd. Pearlware was manufactured from 1780 to 1830 (Noël-Hume 1991). The transfer print is a European scene, showing a fence, a bush, and part of a building.

The Malus-Beauregard House was built in ca. 1833. Since this sherd predates the house, it is possible that the sherd came from one of the older houses on property. The Rodriguez House could be a likely candidate for this sherd. The remains of the Rodriguez House are located about 107 meters (350 feet) to the west (Risk 1999:33) and

Figure 28. Artifacts recovered from monitoring.

Table 12. Soil Profile of Trenches 1–3.

Trench 1	Trench 2	Trench 3
0–6 cm 10YR3/2 very dark grayish brown silty clay loam	0–4 cm 10YR3/2 very dark grayish brown silty clay loam	0–12 cm 10YR3/2 very dark grayish brown silty clay loam
6–50 cm 10YR4/2 silty clay mottled with a 10YR4/6	4–40 cm 10YR4/2 dark grayish brown clay with a slight silt content. Mottled with 10YR4/6	12–110 cm 10YR4/2 dark grayish brown clay. Mottled with 10YR4/6
50–140 cm 10YR5/1 gray clay with some 10YR4/6 mineralization. Very wet and compact.	40–140 cm 10YR5/1 gray clay with some 10YR4/6 mineralization.	110–120 cm 10YR5/1 gray clay. Very compact.

sherds and debris could easily be scattered that distance due to refuse disposal, construction, and earthmoving.

The other item recovered during the monitoring was a dark blue medicine bottle with the words "BROMO SELTZER EMERSON DRUG CO BALTIMORE MD" embossed on the base. The bottle is 6.58 cm (2.6 inches) tall and 2.96 cm (1.17 inches) wide. During the late eighteenth and early nineteenth centuries, cobalt was used to produce rich blue color in medicine bottles and other glass wares (Jones and Sullivan 1989:14). Isaac E. Emerson trademarked Bromo-Seltzer in 1889 (Fike 1991:111). Bromo-Seltzer was sold with cork stoppers until 1928 (Fike 1991:111). The bottle has a triangle on the base with a small dot in the center. However, the manufacturer of this bottle could not be determined. The date of the bottle, 1889 to 1928, is vastly different from the pearlware, 1780 to 1830, while both were found in the same backhoe pit. This is a testament to the amount of disturbance that has taken place in certain areas of the park.

Chapter 7

GPR RESULTS

Ground penetrating radar is a useful tool for archeologists because a large amount of data can be collected with relative ease without disturbing the archeological features. The Geophysical Survey System Inc. manufactured a Subsurface Interface Radar 2 (SIR 2) GPR system. The operator used this system at Chalmette. The system consisted of the control unit, the control cable, and the antenna (Figure 29). The unit was powered by direct current from a car.

Figure 29. SIR 2 GPR unit.

The GPR transects were laid out with a metal pin flag at each end and a spray painted dot every two meters. The operator added an electronic event mark to the recording as the unit passed over each dot. These event marks showed as vertical dashed lines on the screen display and on the paper printouts. The operator entered two events at the start and conclusion of each line, signaling the assistant to begin or end the recording as appropriate.

Following the completion of each transect, the operator and his assistant recorded all visual terrain and intrusive features along the transect. This allowed the operator to eliminate superfluous readings and focus on the subsurface anomalies. The transects were numbered sequentially by the control unit beginning with 117 and continuing through 201. This numbering sequence was maintained so that the electronic files, the printouts, and the metadata will be consistent.

Over a three day period, 85 GPR transects of varying lengths were collected during the project. Over 3.42 kilometers (2.13 miles) of transects were recorded resulting in approximately 278 anomalies. Nine general areas within the Park were targeted: the Freedmen's Cemetery, the Civil War powder magazine area, the Rodriguez Canal, the Rodriguez House archeological site, the Malus-Beauregard House, a Civil War earthwork, the National Cemetery, the east side of the reconstructed Line Jackson in the area of previous archeological testing, and the west side of the reconstructed Line Jackson. Selected anomalies are presented in this chapter and all transects are reported in a separate data supplement.

FREEDMEN'S CEMETERY

The first area surveyed was chosen because the CRGIS's projection of historic maps indicated that

the Freedmen's Cemetery was located in the general area. Transects 117–129 were located outside of the tour road with the northern most transect, Transect 129, crossing the north end of the parking area at the first wayside on the tour road. All transects in this area were run east to west.

The transects in this area were extremely unproductive. The wet conditions of the soils may have hampered the finds of the GPR. Anomalies were recorded on Transects 120, 121, 122, 123, 124, and 128. However, none of these had the signature typical of graves. Transect 124 shows a clear example of anomalies from this area (Figure 30).

The survey was continued on the interior of the tour loop. Transects here numbered 147–169, with only Transect 160 running from the Cemetery wall across the tour loop and ending on the same line with the other transects. Although anomalies were present in many of the transects, no graves were detected.

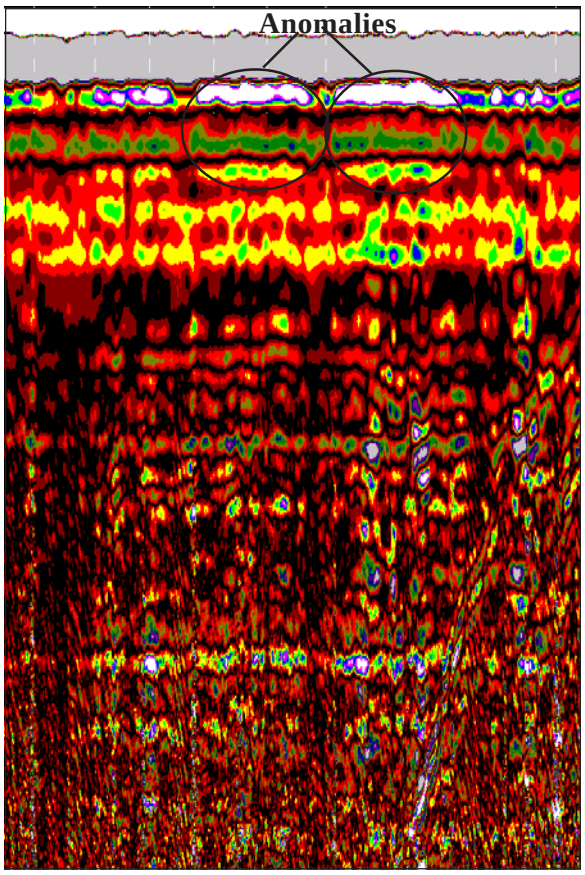


Figure 30. Section of Transect 124 showing anomalies.

THE NATIONAL CEMETERY

Since the results in the presumed Freedmen's Cemetery area were so unproductive, it was decided that test transects should be run in the National Cemetery in the location of known graves. Two north/south lines were laid out inside of the cemetery wall immediately southeast of Transects 117 and 129 in the Freedmen's Cemetery area that were outside of the tour loop. Transect 193 was located between the cemetery wall and a row of head stones. This transect produced four anomalies that were interpreted by the operator as graves. Transect 194 that runs between the first and second row of head stones, produced three additional anomalies that may also be graves, however, the anomalies on both of these transect were not very discreet.

THE CIVIL WAR POWDER MAGAZINE AREA

The CRGIS map analysis had targeted the area to south of the proposed Freedmen's Cemetery as the location of a Civil War powder magazine. Transects 130 to 141 were located in this area (Figure 31). All runs were conducted from east to west. On Transect 131 there was a very distinct soil change in the last 12 m of the run. However, this soil change was not noted in either adjacent profiles that were 4 m away. On Transect 133 there were surface breaks at the 3 m and 8 m event marks. There were also two possible anomalies at .5 m and 1.1 m of depth. On Transects 135 and 136 there are anomalies that begin around 0 m and continue to 2.5 m. On Transect 137 this anomaly begins at 0 m and continues to 4.5 m. The remaining transects produced no notable anomalies. The anomalies located at the beginning of the run on Transects 135–137 are possibly the remains of the Civil War powder magazine.

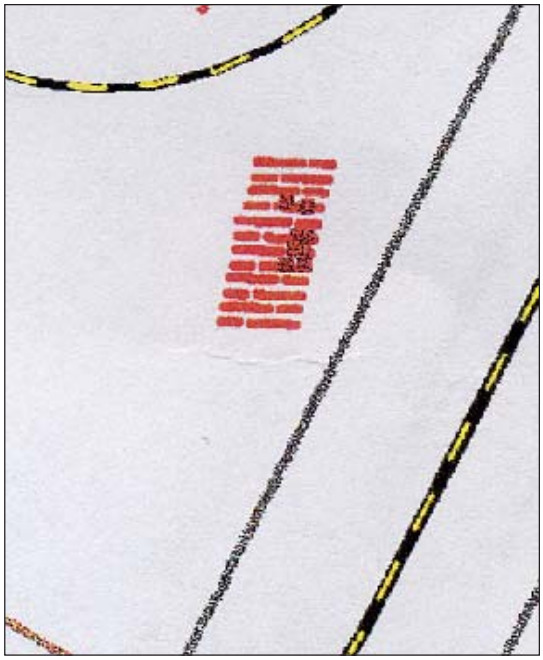


Figure 31. Plan view of anomalies possibly representing the Civil War powder magazine.

A CIVIL WAR EARTHWORKS AREA

Historic maps located in Greene (1985) indicated that the Civil War earthworks might have crossed the north end of what is now the National Cemetery in an area to the east of the park headquarters. The area at the cemetery entrance, contains a flagpole and cannons but no burials. Transects 195 to 200 were laid out in this area. All runs were made east to west. The only significant anomalies recorded were on Transect 196. From 10 m to 16 m on the run the soil was disturbed and there was a very small anomaly at 20 m. However, there was nothing in any of these runs to indicate the remains of an earthwork.

THE RODRIGUEZ CANAL

A single line, Transect 201, was placed across the Rodriguez Canal to the west of the Malus-Beauregard House. The run was conducted on an east to west orientation. This transect is interesting because it showed a large disturbed area on both sides of the canal. There were also anomalies at 1 to 3 m, 22 to 23 m, and at 24 m. The nature of these anomalies is not known. These anomalies should be investigated at future date.

THE RODRIGUEZ HOUSE ARCHEOLOGICAL SITE

Five transects numbering 142 to 146 were laid out within the Rodriguez House Archeological Site. All runs were made east to west with the highest numbered transect being located on the south end of the grid. The data recovered in this area was extremely poor largely due to the root systems of the large oaks in the area. It was the square arrangement of these trees that helped Birkedal identify the site, yet they prevented the GPR from identifying the foundation remains.

THE MALUS-BEAUREGARD HOUSE

Thirteen lines were placed north of the Malus-Beauregard House. They were labeled Transects 171 to 183 from north to south. All of the runs were made from east to west. The data from this area was the best collected by the GPR on this project. Every line produced a number of anomalies. The anomalies can best be understood when overlaid with the 1934 HABS drawings of the area. Several of the anomalies can be correlated with known features, such as paths and wells (Figure 32).

THE RECONSTRUCTED LINE JACKSON

The East Side

One line, Transect 184 was located about 10 m east of the reconstructed Line Jackson. This location was chosen in an attempt to locate evidence of the archeological trenches excavated in 1957 and 1963. The transect was run from north to south.

Anomalies were located at 17 m, 28 m, 34 to 38 m, and 66 m. Disturbed areas were also located at 80 to 84 m and 92 to 96 m. While the nature of these anomalies is not known, they are

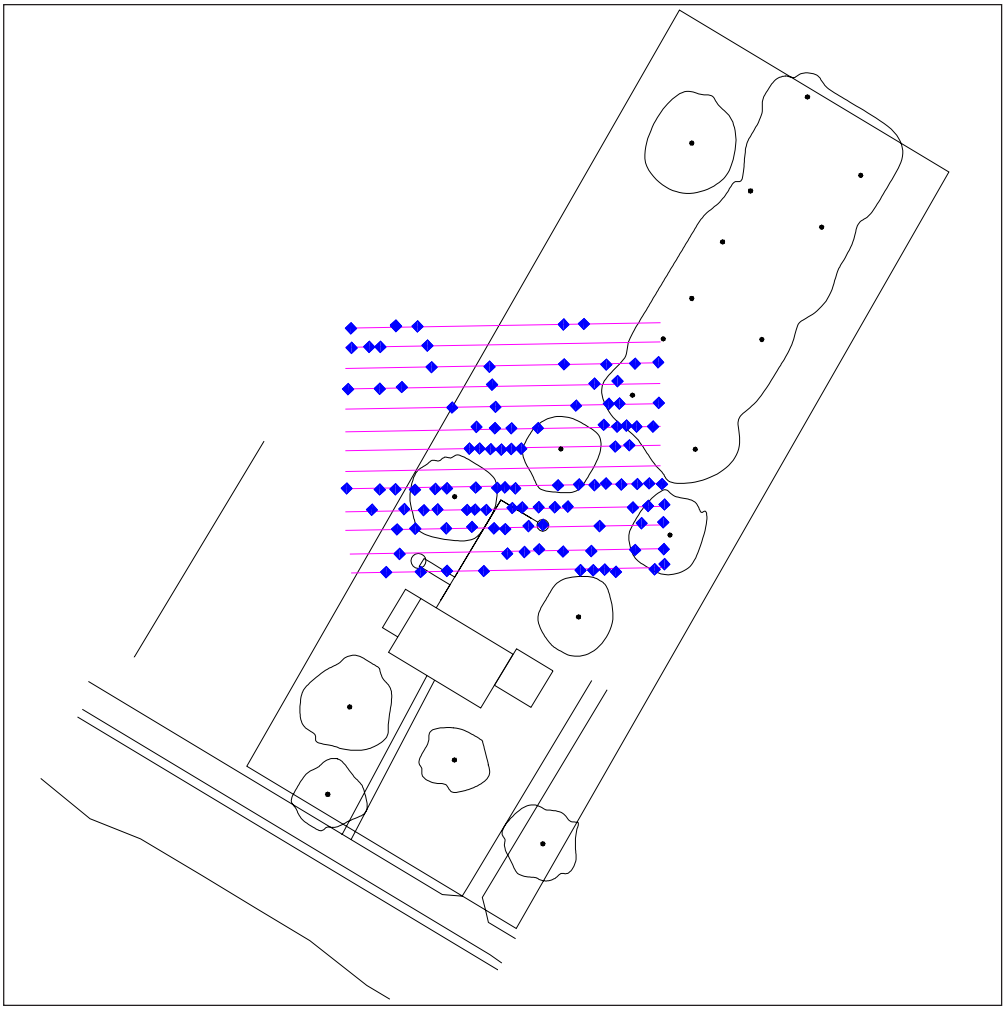


Figure 32. Composite of 1934 HABS drawings and GPR anomalies.

extremely interesting because future testing may verify these anomalies as the trenches from the earlier work.

The West Side

Eight transects were placed on the west side of the reconstructed Line Jackson. The transects were numbered 185 through 192. The runs were conducted north to south, parallel to the direction of the earthwork. There were approximately 80 anomalies, voids, and disturbed areas recorded on the eight lines.

The anomaly located at 56 m on Transect 188 was selected for placement of backhoe Trench 3. The testing (discussed in Chapter 6) showed a soil variation but no stratigraphic or cultural features. The other anomalies along the reconstructed line warrant additional testing, as they may be locations where artillery batteries were constructed for the battle at Chalmette.

CONCLUSION

The GPR was not as effective as anticipated, but some useful information was obtained. Many of the anomalies recorded during this survey warrant additional testing. The entire catalog of GPR transects will be printed in a separate data supplement.

Chapter 8

INTERPRETATION

This chapter consists of three parts. The first part is location maps for various types of artifact and groups of artifacts. Maps for this chapter were produced in Surfer®. Terrain features such as roads, monument, and standing buildings were added to the distribution plots so on every map, except the wire frame, the area surveyed using metal detectors is shown as a bold line. On the wire frame map the surveyed area was slightly raised. The second part of the chapter shows selected groups of artifacts grouped by standard deviation (SD). The final part of this chapter uses observed versus expected artifact counts to graphically show the density of artifacts.

LOCATION MAPPING

The Cartesian coordinates as recorded by GPS, count, and description of each artifact type or group were queried from the project catalog that was stored in an MS Access database. The data was then placed in Surfer® as a classed post map. Separate boundary files were created for the two non-contiguous metal detector survey areas. The base map showing park roads and buildings was created in AutoCAD® and exported into a data exchange format that could be read by Surfer®. All of these data layers were combined to produce each location map.

The first map produced showed the fired and unfired buckshot (Figure 33). While over 50 percent of the park was surveyed using metal detectors the map shows clearly that most of the buckshot were located in the wooded area. Only the two northwest most buckshot were found in the grassy area by the reconstructed Line Jackson. These buckshot are not confined to this area due to any fluke in the survey methodology. In most ways the survey in the current wooded area was much harder to undertake due to the vines and other hazards. The pattern demonstrates that the now-wooded area is where the intensive American fire was being placed on January 8, 1815 and to a lesser degree on December 28, 1814. The majority of the buckshot on the east side of the Fazendeville Road were fired, most likely reflecting American fire at the British who advanced along a narrow front. On the west side of Fazendeville Road, 8 of 24 buckshot were dropped. Since one third of the buckshot on the American side of the battlefield were dropped, it is presumed that this represents the activity of American pickets stationed forward of the American line who gave the first fire to the advance British. It cannot be determined what proportion of these buckshot came from each of the two days of fighting. However, the fact that more buckshot were dropped closer to the American side does give credence to the location of the reconstructed earthworks as the approximate location of the historic Line Jackson.

Based on the results of previous metal detector surveys in the Southeast Region of the NPS, the dropped to fired ratio is around 2 to 1 on a tactically stable battlefield. Nine of the musket balls were unfired, 19 were fired, and 1 pulled. This ratio is .47 to 1.

When this same ratio is calculated for the buckshot, it produces .4 to 1. Again the ratio of fired to dropped is almost reversed from what would be expected. Based on surveys at other battlefields in the region from similar periods, it is expected that for every impacted round near the American line, there would be two dropped balls. However, this is not the case at Chalmette. For every two impacted musket balls along the British attack corridor, there is only one dropped musket ball. This finding in combination with the buckshot data indicates that the British were indeed not firing very

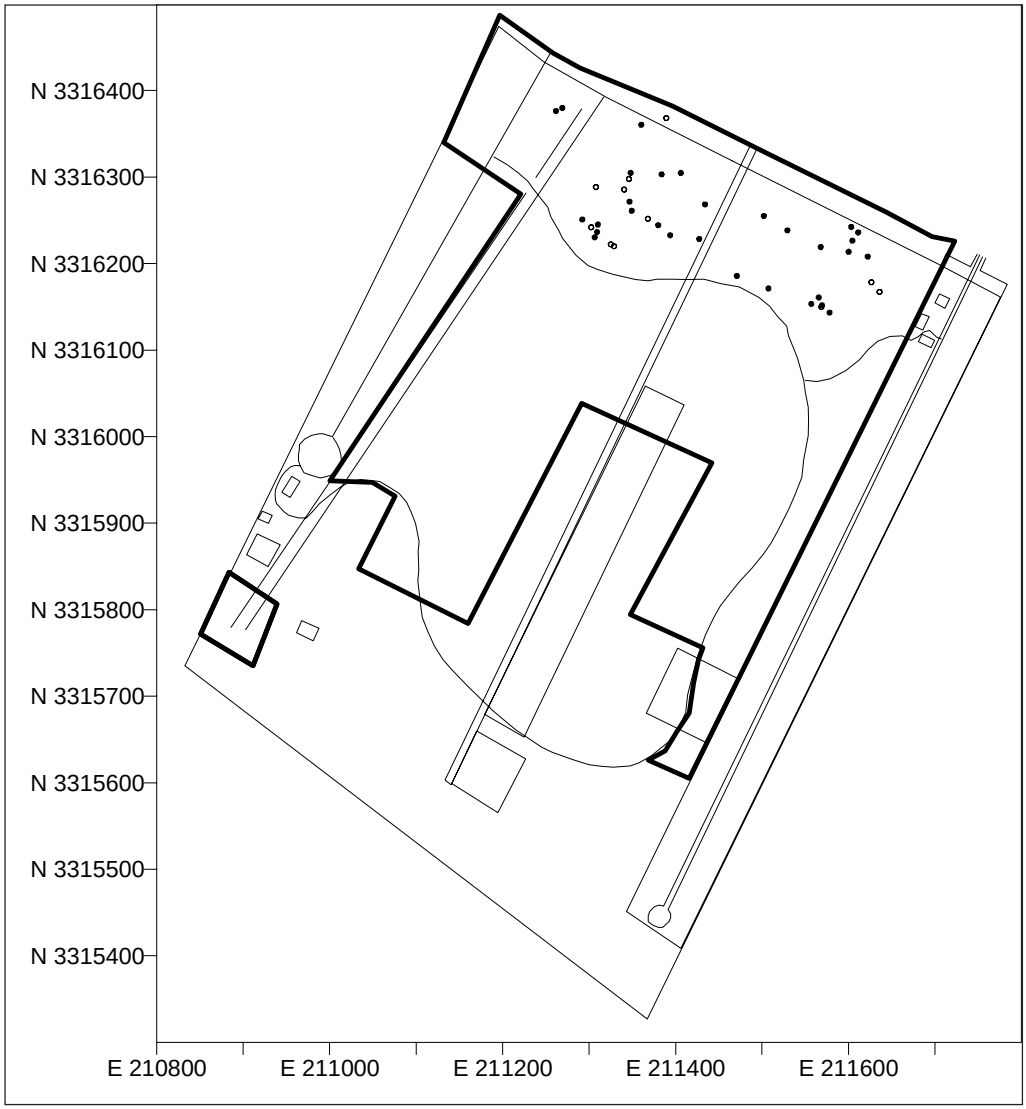


Figure 33. Fired verses unfired buckshot. Solid are fired, empty are unfired.

often as they drew closer to the American lines. These data show the effect of the American fire on the approaching British. Attempts by the British to load and fire must have been virtually nonexistent as they approached the American line. While the outcome of this battle is well know the Chalmette pattern could be used to determine the nature of less known military actions.

Since the British were using 0.69 caliber balls, all of the buckshot came from the American side. The standard load for the Americans was 1 musket ball and 3 buckshot. Within the survey area, 29 musket balls and 42 buckshot were recovered. For that number of musket balls, 87 buckshot should have been recovered. There were only 1.44 buckshot recovered for each musket ball. The manner in which buckshot was employed may partially explain why these ratios are not accurate. It was not uncommon for a shooter to load anywhere between 1 and 5 shot with the single musket ball.

Approximately 80–90 m east of the reconstructed Line Jackson is a concentration of buckshot. The reasons for this concentration are not known but there are several possible explanations for this. It is possible that the buckshot clustered in this area represents the location where the ad-

vancing British received the first concentrated volley of American fire. Darling (1993:10) commenting on musketry warfare in general and not specifically the Battle of New Orleans states that "On account of the inaccuracy of the smooth-bore musket, the attackers were relatively free of casualties until they reached a point eighty to a hundred yards from their objective."

The above explanation does not explain why there were few buckshots recovered between the cluster and the reconstructed earthwork. This lack of evidence is most likely the result of masking that occurred due to the presence of a historic structure foundation east of the reconstructed earthwork and west of the buckshot cluster. Large quantities of ferrous metal was present around the structure foundation making successful metal detecting impossible. Since a buckshot is an extremely difficult item to locate the addition of metallic background noise created by the structural debris would make locating a buckshot virtually impossible.

Another possible but less likely cause for the clustering of buckshot is that original line Jackson was located further to the west than the reconstruction.

The map of the fired and unfired musket balls is extremely interesting. A small area between the Spotts Monument and the Rodriguez House archeological sites was surveyed using metal detectors. It was expected that the area would produce evidence of the levee attack, as it was known, at least one 0.69 caliber musket ball came from the Rodriguez House area (Birkedal n.d.). In this area in the southwest corner of the map three fired and one dropped musket balls were recovered (Figure 34). Although a very small sample, the ratio of one dropped to three fired would be consistent with the British successes on that end of Line Jackson. However, the most interesting recovery is the single musket ball that was pulled from a musket after being stuck. It is unlikely that a soldier would have stopped to unjam a gun in the open on a battlefield under intense fire. It would be much more likely that this activity would take place at a campsite or behind the rampart during the battle. In either case this leads additional credence to the location of the reconstructed Line Jackson as being essentially correct.

Four additional drops were located on the eastern side of the park near the National Cemetery. These could be from the Jan 1 attack or from the movement of the 93rd highlanders across the field

On the north end of the American line, east of the Fazendeville Road both fired and dropped musket balls are present. While on the west side of the road, all of the musket balls are dropped save one that greatly over flew the American line and is no doubt a British fire 0.69 caliber. The majority of the musket balls on the east side of the road were larger calibers and thus most likely are British incoming rounds. The drops on the west side are generally smaller and are presumed to be from American pickets. However, this pattern could represent the drops of wounded and dying British on the west and overshoots by Americans on the east. The impacted rounds to the west are at the extreme end of the effective range for a musket. It is not know if this is the result of the original Line Jackson being slightly further to the east or over zealous Americans elevating their muskets in attempts to kill fleeing British soldiers.

Three different types of artifacts are displayed in (Figure 35): cannonballs, case shot, and conical artillery shells. Besides these six items found in 2000, only two other artillery projectiles have been legally recovered from the battlefield. They are a 6 pounder cannonball recovered by Wilson (1963) near the site of Battery Number 5 and an iron canister ball recovered in 1993 to 1994 by Yakubik (Yakubik et al: 2001).

Located on the east side of reconstructed Line Jackson approximately 150 m northeast of the Chalmette Monument, a conical iron artillery shell fragment was recovered. While there was not enough of the shell to identify it, it is similar to a Hotchkiss type used in the Civil War. Shells of this type were not used in the War of 1812 so, this artifact obviously came to rest in the field when Union gunboats attacked the city of New Orleans in 1862.

Two spherical shell fragments were found further to the east and north of conical shell fragment. These two shells are case shot, or explod-

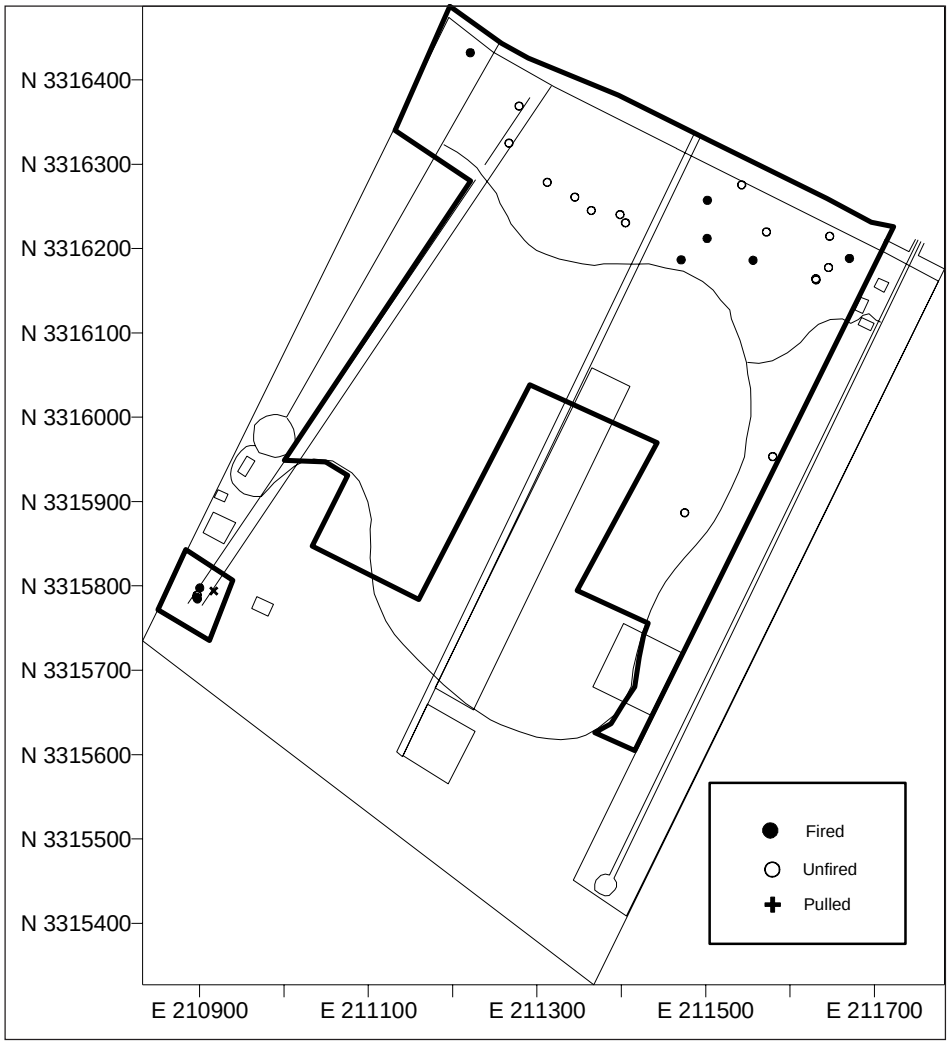


Figure 34. Fired verses unfired musket balls.

ing anti-personnel shells. This type of shell was used as early as the American Revolution and remained in use throughout the Civil War. These two shell fragments have been assigned to the War of 1812 era based on the fact that Union ships generally would not fire case shot.

Three 3 pounder solid iron cannonballs were also recovered. As previously discussed this type of shell would not be fired from the Union gunboats. The northernmost of these shells was located east of the Fazendeville Road near the north end of the park. This is the same area where the buckshot and musket balls were located, indicating that this cannonball was fired at the advancing British. The other two cannonballs were recovered close to the National Cemetery wall in the vicinity of the Freedmen's Cemetery. As previously discussed, four musket balls were also found in this area. Given the combination of these artifacts, it is possible that the two cannonballs and two musket balls represent the artillery dual that took place on January 1, 1815 or northwest attack of the 93rd Highlanders on January 8, 1815.

STANDARD DEVIATION (SD) MAPPING

Surface trend analysis software such as Surfer®, which was used for the Chalmette study, are used by archeologists to identify areas where artifacts

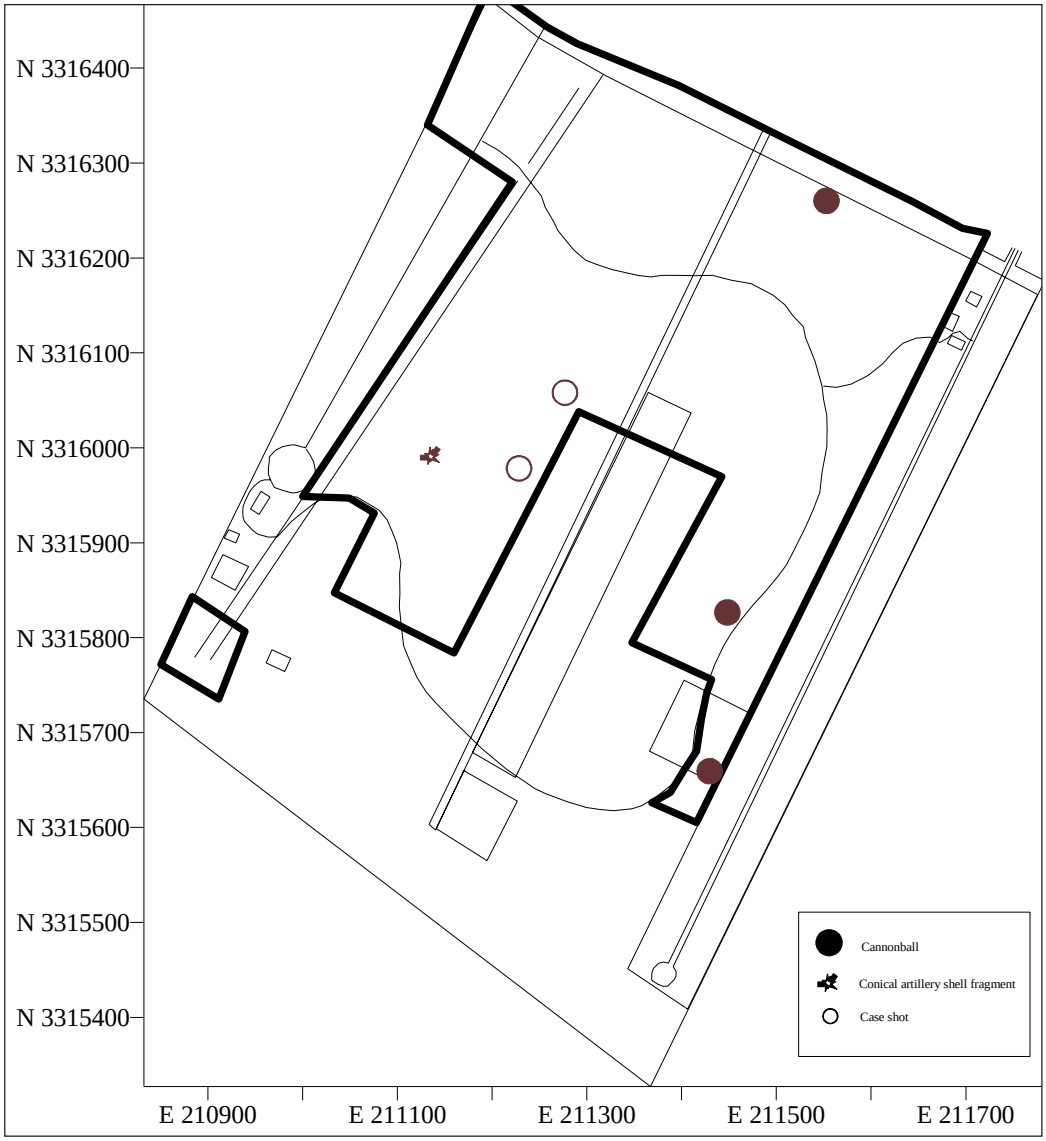


Figure 35. Location of cannonballs, artillery shells, and case shot.

are concentrated. Since the metal-detected artifacts from Chalmette were recorded individually, Surfer sees only values of 1, leaving no values to contour. The problem was overcome with the assistance of Dennis Finch (SEAC) who wrote a program in MS Access that created a 20-meter digital or "soft" grid over the park and then assigned each artifact to its appropriate grid unit. The result is grid cells with different totals that will produce a map of concentrations. Although accomplished on a computer in this case, the result is the same as that produced by a method long used by archeologists when they create a "hard" grid at the site with stakes and string, then provenience artifacts according to the square where they are collected.

Three other steps were needed to produce the Chalmette distribution maps. Standard Deviation (SD) mapping displays the artifact data for each cell in terms of how it varies from the mean value of all the cells. The difference is expressed in terms of the standard deviation for the data set

and the effect is to highlight variation among small samples. Kriging, the process of applying a mathematical model to the data, was used to smooth the resulting map and prevent false ridges between data points. A blanking file was created to exclude all areas that were not metal detected from Surfer's interpolations.

The first map produced using the SD method was a test of the method using non-military artifacts whose distribution is predictable—coins (Figure 36). This map tells a very interesting tale of park use. The highest concentration of coins is in the area west of the Malus-Beauregard where picnic tables are currently located. The next largest concentration of coins is located along the east side of the reconstructed Line Jackson near the parking lots and monuments. Based on the pattern of these coins, it is clear that the majority of the visitors do not venture far from the car when visiting the battlefield, and the mowed green space along the road is used for recreational activates such as picnicking and sight-seeing where coins often fall from pockets of picnickers and visitors on the ground.

Returning to potential military items, the next map shows the distribution of lead at the park (Figure 37). It has been the author's experience that the majority of the lead found on a battlefield is generally related to the battle. While the lead is widely dispersed across the Chalmette battlefield, there are distinct concentrations that mimic the buckshot and musket ball patterns in the wooded area on the north side of the park, a good indication that these lead fragments relate to the battle. Two large chunks of lead were located at the northwest corner of the park near the presumed loca-

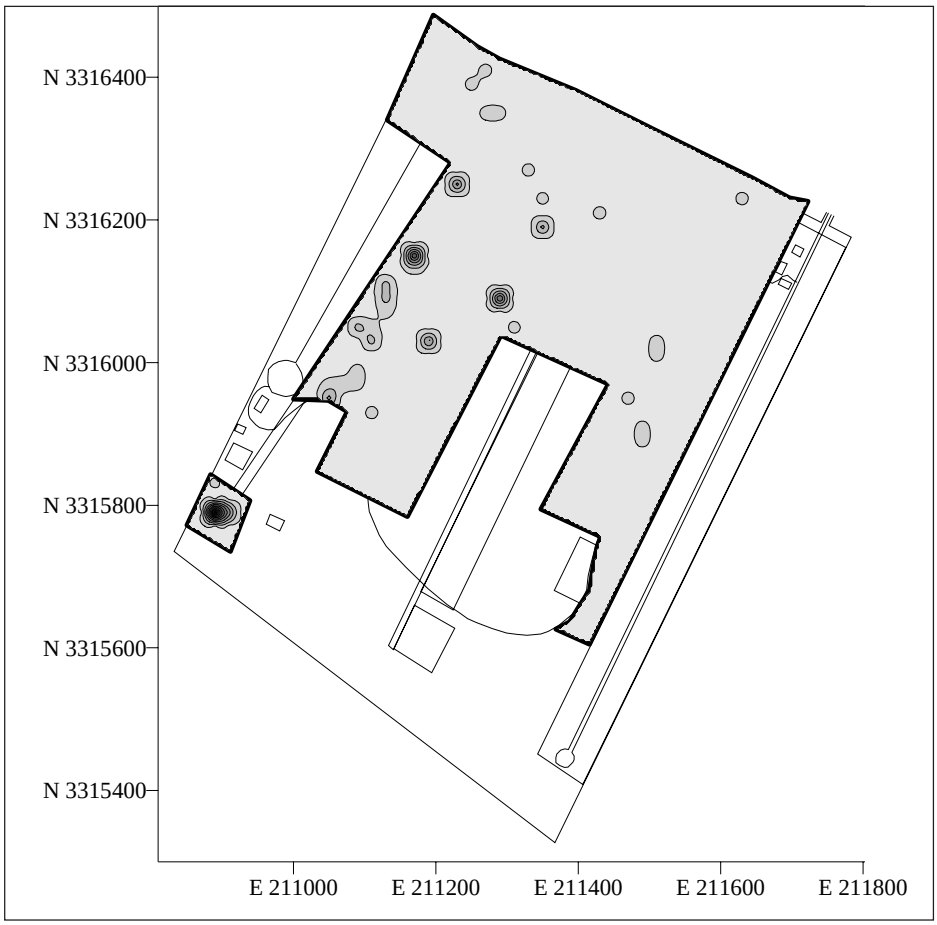


Figure 36. SD map of coins recovered from the battlefield.

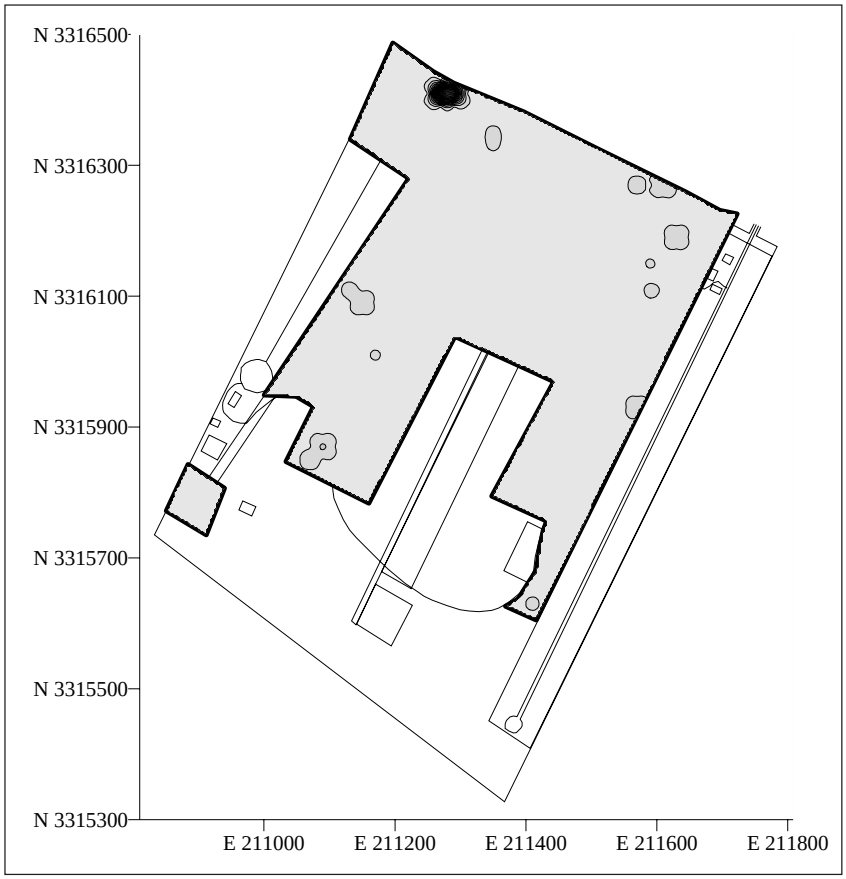


Figure 37. SD map of lead recovered from the battlefield.

tion of the historic Line Jackson. The source of the large lead objects is not known, but it is possible that they were carried by soldiers to be cast into musket balls for the forthcoming battle.

A number of Civil War artifacts were recovered during the survey (Figure 38). They were clustered in two general areas. The first is in the northeast corner of the park near park headquarters. This is as expected since Civil War earthworks were also located in this area. The second grouping was east of the reconstructed rampart in the vicinity of the Chalmette Monument. The type of artifacts recovered in this location includes buttons and other items that indicate this is a possible Civil War campsite.

As was the case with the buckshot distribution map (Figure 33), the SD map of the buckshot is visually striking (Figure 39). As previously stated, the pattern of recovery is not due to differences in vegetation. They were found in the wooded area because that is where the main British attack took place. Latour (1999:111) states that "...extending from the ditch of our lines to that on which the enemy drew up his troops, two hundred and fifty yards in length, by about two hundred in breadth, were literally covered with men, either dead or severely wounded." At the time of the battle, the area was an open field. The woods have been allowed to grow in recent years to represent the swamp that was further to the north in the area that is now the railroad, St. Bernard Highway, and the fields north of the highway.

The British attack on the north end of Line Jackson was on a very narrow front. The British were hoping to punch a hole through the American line rendering the defensive position useless. The distribution of the buckshot is almost 100 meters wide. If the front of the British attack

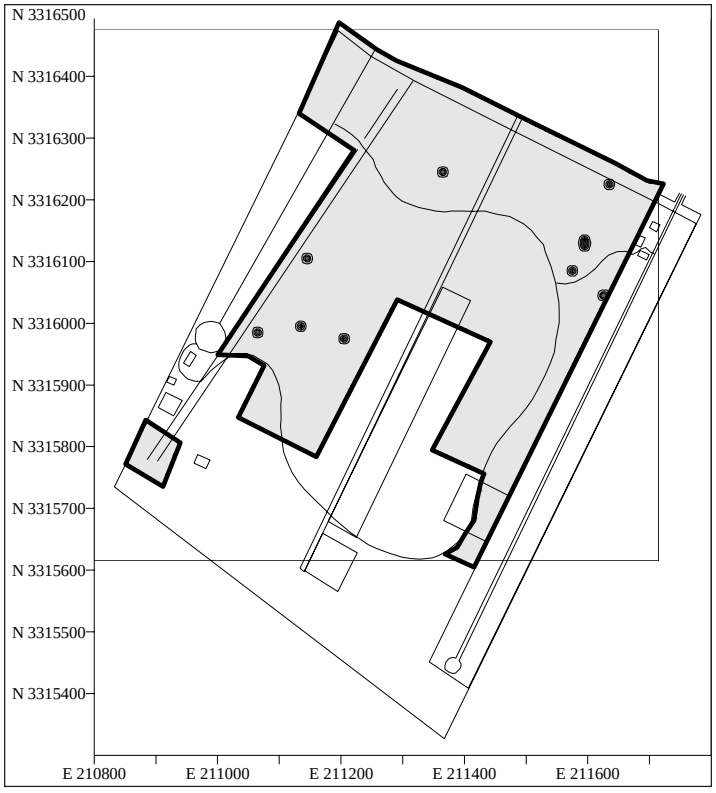


Figure 38. SD map of Civil War artifacts recovered from the battlefield.

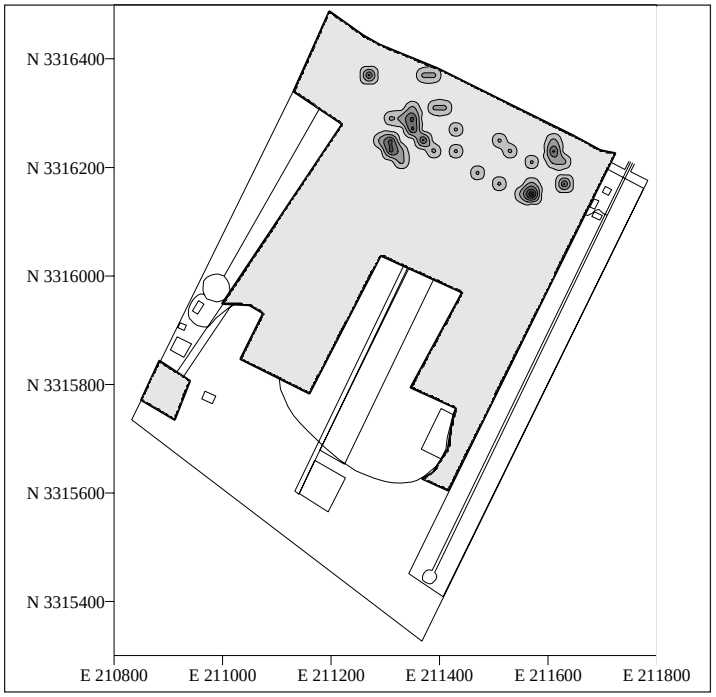


Figure 39. SD map of buckshot recovered from the battlefield.

was 200 yards (182 m) wide, as shown on the Latour maps and CRGIS composite map, that would mean that the park has preserved about 50 percent of the attack. The other half was destroyed by the railroad and highway construction.

The musket ball maps show the same story as the buckshot (Figure 40). The overwhelming majority of the musket balls were found in the wooded area. The second concentration, located in the southeast survey area, reflects the intense nature of the fighting along the Levee Road. The musket balls in the wooded area are more dispersed reflecting the difficulty of firing during the long charge by the British column attempting to reach the American line.

When both the buckshot and the musket balls are combined the interpretation does not change (Figure 41). The wooded area still again shows the dispersed pattern.

ANALYTICAL MAPPING

Although the spatial distribution of artifacts on the landscape was clearly shown in the previous location and SD maps, this approach only allows the observer to make intuitive judgments about the intensity of the battle in selected areas. By comparing the observed distributions with an idealized (normalized) one with no concentrations, however, the

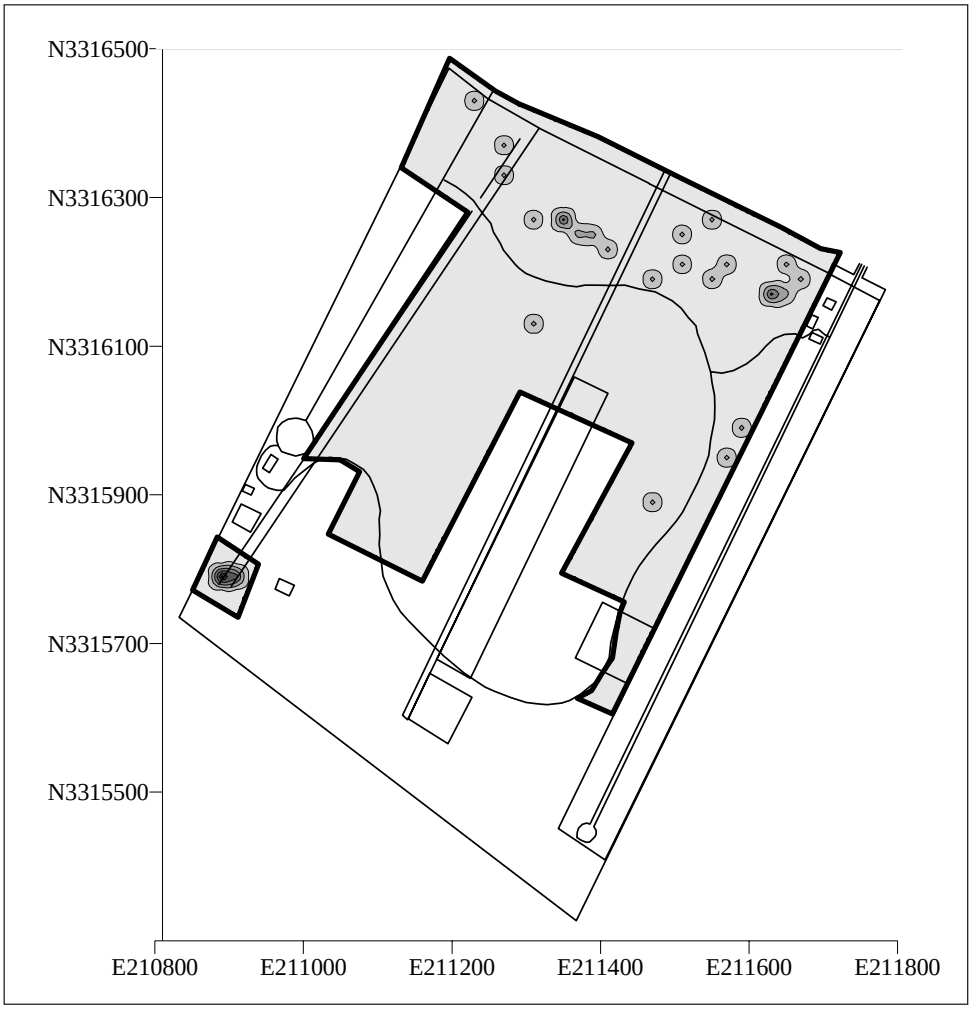


Figure 40. SD map of musket balls recovered from the batlefield.

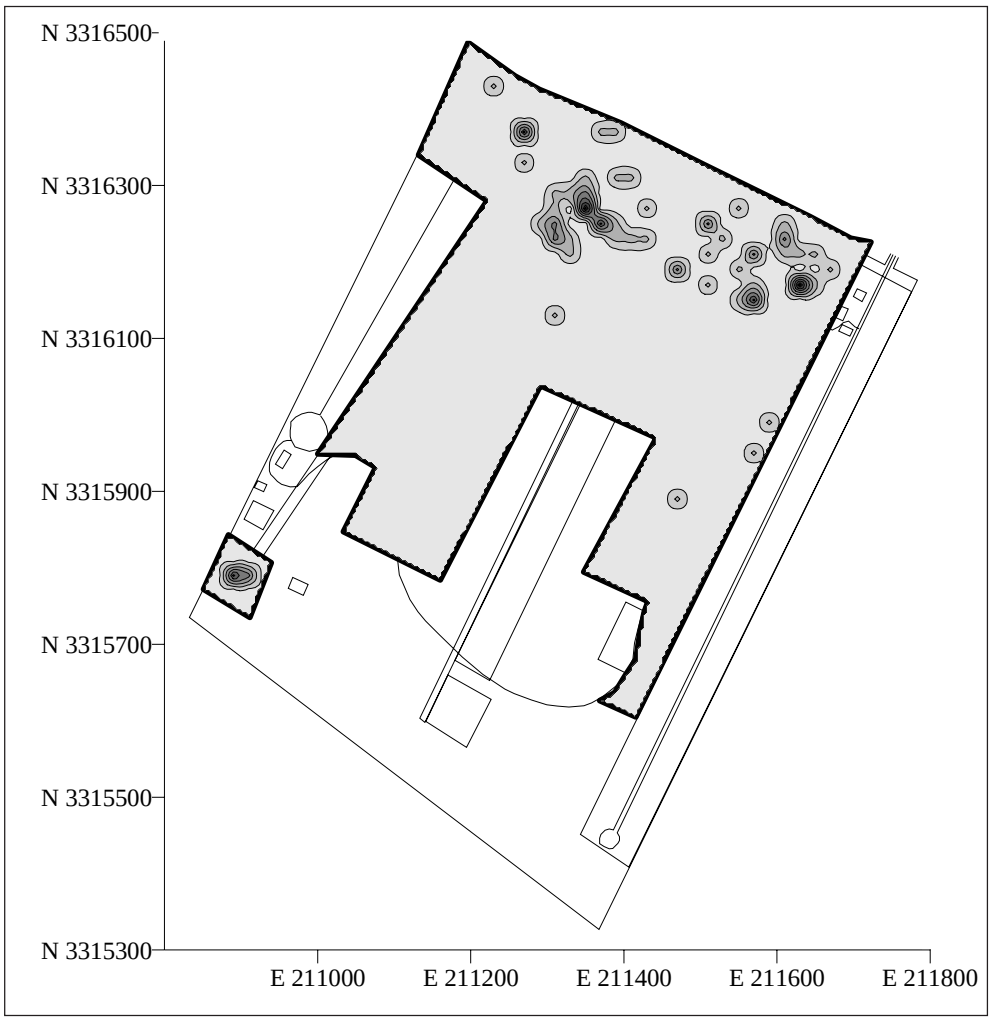


Figure 41. SD map of musket balls and buckshot recovered from the battlefield.

intensity of the battle can be seen and judged by the distribution of spikes (anomalies or deviations from the expected norm). In this case the intensity of fire is apparent in the wire frame model showing the count of buckshot and musket balls as vertical spikes.

This method of distribution analysis follows a procedure similar to the SD mapping. The artifacts were aggregated into digital grid cells. But instead of comparing cells in terms of standard deviations, it is in terms of values that would be expected if the distribution were even. Each cell's expected value is based on the values in all of the cells in its north-south column and its east-west row. The expected value is then subtracted from the observed and the results are mapped as deviations from the expected norm.

Because an adequate sample size was available for only these artifact categories, the calculations were only undertaken for the buckshot and musket balls. The maps produced (Figures 42 and 43) were wire framed so the intensity of fighting could be clearly shown. Both of these maps clearly show the intensity of the fighting on the north end of the battlefield. The spikes represent where the observed artifact density is much higher than the expected. They also illustrate the agony of the British soldiers faced in the attempted attack of the American Line on January 8, 1815. The range of the spikes shows the intense nature of the fire.

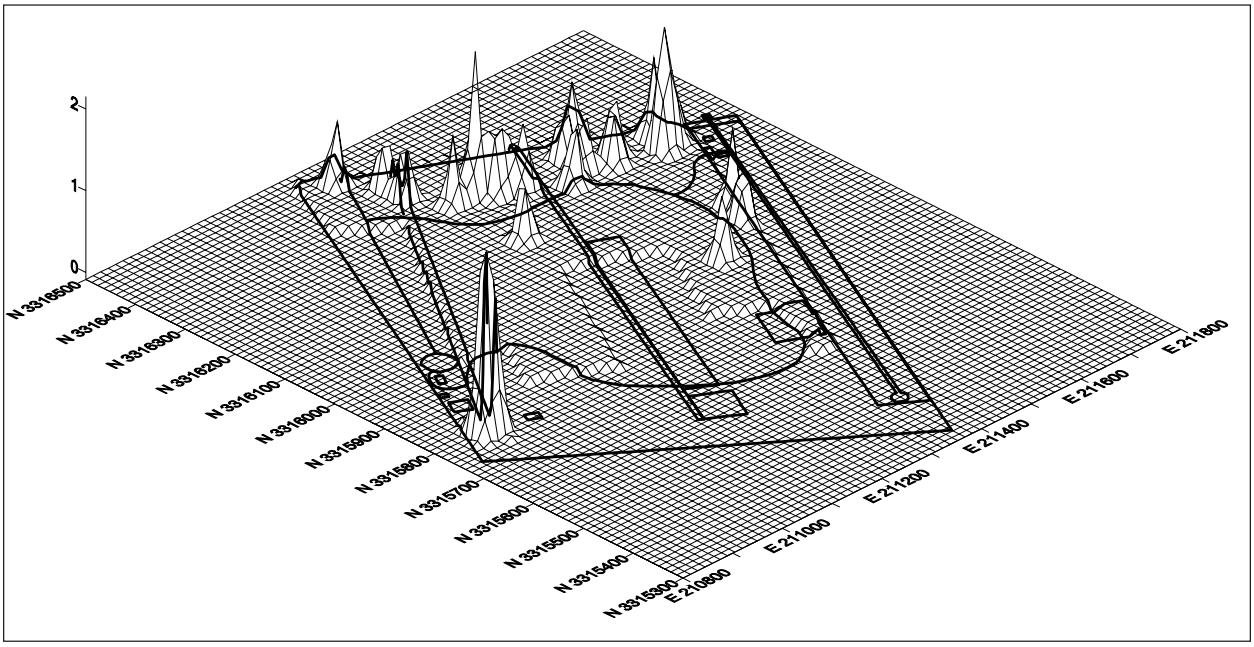


Figure 42. Observed versus expected map for musket balls recovered from the battlefield.

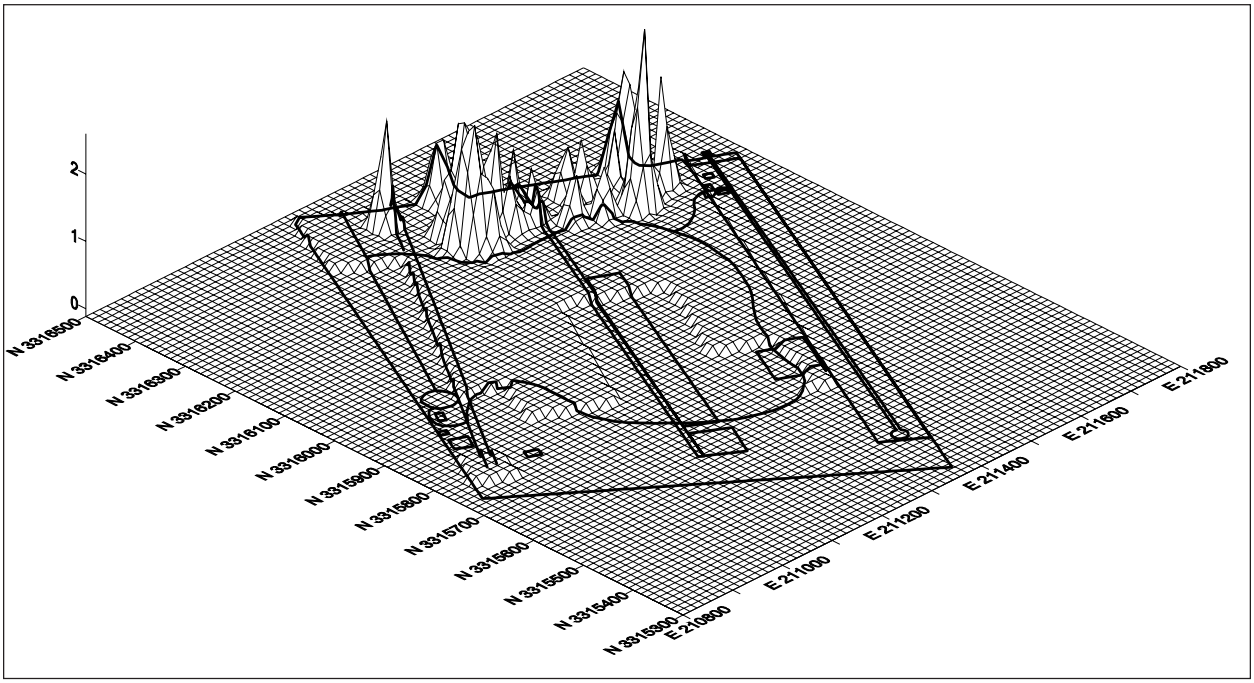


Figure 43. Observed versus expected map for buckshot recovered from the battlefield.

Chapter 9

SUMMARY AND RECOMMENDATIONS

CONCLUSIONS

This survey produced conclusive and systematic evidence of the Battle of New Orleans, the final action of the War of 1812. While the archeological debate continues about the archeological remains of Line Jackson, there is no doubt about the location of Pakenham's attack. The attack took place on the north end of Line Jackson just south of the swamp. Today, at least half of that area is within the Chalmette Unit of JELA. The archeological remains of the other portion of the attack on the north end are presumed destroyed by railroad and highway construction.

Finding the remains within the park took hard work and dedication from a number of individuals over many years. One of the most important events that made this survey possible was Birkedal's 1984 (n.d.) survey that demonstrated that only about 180 m of the battlefield had been lost to the Mississippi River since 1815.

The next step in locating the battle lines was the composite map produced by CRGIS. This map was an overlay of two Latour maps and a modern map that allowed the survey crew to begin working in the correct area on the first day of the survey. An old archeological adage states that the most important find will be made on the last day of the project. Due to the CRGIS map, the most important find was made closer to the first day of the project and the remainder of the project was spent refining and understanding the battle lines.

Conclusive artifacts from the War of 1812 include 29 musket balls, 42 buckshot, 3 three pounder cannonballs, 2 case shot fragments, a Naval button, and a period buckle. Definitive Civil War artifacts include 7 Minié balls, a canteen fragment, and a two part military button.

While some archeologists debate the location of Line Jackson, the results of this survey, specifically the metal detector survey, show that the line is essentially in the correct location. Although it was not the goal of this survey to locate Line Jackson, the project data certainly indicates that creators of the park placed it in the correct location.

Besides conclusively determining the location of the battle lines, the project also demonstrated the ineffectiveness of shovel testing as a cultural resources management method on battlefields. Systematic controlled metal detecting should be used to answer most research questions concerning a battle. Areas such as campsites and structures where non-metal artifacts and features may be present should still be tested using traditional methods. Shovel testing was shown once again to be an effective means for locating aboriginal material as demonstrated by the recovery of two aboriginal pot sherds, the first prehistoric artifacts located within the Park.

RECOMMENDATIONS

Additional systematic metal detector surveys could provide interpretive data for the park. One area of high potential is the National Cemetery around the park headquarters, where it is presumed that no bodies are buried. It is therefore recommended that another metal detector survey be undertaken extending from the east side of the woods to the east park boundary, encompassing the northern end of the cemetery.

It is also recommended that the park secure permission to survey the areas on the north side of St. Bernard Highway where Line Jackson extended into the swamp. The area is currently in pasture but given the rate of new construction in that area, the survey should be undertaken immediately. This survey could be conducted in cooperation with state and city officials and local organizations. Other areas

such as the west bank and possible British gun position could also be investigated as a part of a partnership project sponsored by the NPS.

One resource at the park that is potentially highly significant is the Freedmen's Cemetery. In this cemetery, freed African slaves were reburied while in the care of the Union Army. A number of GPR transects and thermography reading were undertaken in this area. Despite several false alarms, no evidence for graves was encountered. The area as defined on the CRGIS composite map should be marked off, mowed, and provided with an interpretive wayside. At the earliest possible date an archeological project should be designed to locate, delineate, and assess the interments of this important cemetery. One method that may prove useful would be a study of the potassium that remains in the soil after human remains deteriorate.

Additional remote sensing in the form of GPR, thermography, and magnetometer is not recommended. All of these methods have been tried at Chalmette with minimal results. The water table is too high and the soils are not conducive to geophysical prospecting. Of course, these and other remote-sensing techniques are constantly being refined and should not be overlooked in the future; however, currently they are not appropriate at Chalmette.

While the GPR did not perform as well as could be expected, when compared to other parks where the authors have used it, several anomalies warrant additional investigations. The first area is the series of anomalies along the west side of the reconstructed earthworks where the GPR showed a series of voids and anomalies. Two large voids were located on the sides of the Rodriguez Canal between the Malus-Beauregard House and Rodriguez House archaeological site. The cistern and well north of the Malus-Beauregard were also clearly present on the GPR. Finally, testing should be undertaken in the area of the Civil War powder magazine shown on the CRGIS maps and detected by the GPR. If the intact remains are present, they should be investigated for possible insight on the life of the Confederate soldier at Chalmette.

The first sanctioned attempt to locate the British mass graves was undertaken by Rex Wilson in 1964 and the most recent was in 2000 by the thermography operators Bob Melia, President of Real-Time Thermal Imaging and Archeologist Jill-Karen Yakubik. The post battle reports by Latour (1999) and others speak of the removal of the dead and wounded from the battlefield (MHRP 1941). The British dead were buried behind the lines at the Bienvenue plantation now under the former Kaiser Aluminum Plant. No further attempts to locate these graves are recommended within the park. However, a report on the disposition of the graves should be undertaken in order to dampen the long-standing rumors of mass graves in the park. All historic references to the graves should be compiled and synthesized. Local residents and volunteers informed the survey crew that many War of 1812 items were uncovered at the time Kaiser Aluminum was built. These newspaper articles should be researched and a call put out to the local community for individuals who have these items to bring them to be photographed and inventoried.

Another area of major importance is the African American community of Fazendeville. Many of the former building sites are still visible within the park. A multidisciplinary study program, concerning the lives of the residents should be undertaken. The functions and internal structure of the community and its relationship to the development of the Chalmette area should be reflected in the data concerning, for example, diets and socio-economic status. The study should include written sources such as newspapers and government records augmented by data from unwritten sources such as oral histories and the archeological record that tell all sides of the story.

Finally, conflicting opinions remain concerning the evidence for the southern end of the American rampart. Birkedal (n.d.) believed he had uncovered the remains of a battery and palings from the rampart. Goodwin (Goodwin et al 1991) believed that the palings post dated the 1815 battle and further search for the rampart should be abandoned on the south end of the park. Conversely, Yakubik (Yakubik et al 2001), who was involved in the Birkedal and Goodwin surveys, believes that the palings do indeed date to the battle era and that additional testing should be undertaken. Yakubik

(Yakubik et al: 2000) had the species of wood identified, but no attempts appear to have been made to undertake a dendrochronological study of the wood to ascertain when the trees were cut.

There are arguments against continuing the search for the rampart. The first is that the already existing reconstruction is on or near the original location. Secondly, the area west of the reconstruction has been severely disturbed as evidenced by the shovel testing from this project. Nevertheless, previous investigations have found archeological remains, so there is a strong possibility that important battle resources can be found. One reason why the debate continues is the piecemeal nature of past projects, so this important study should be undertaken on a large scale instead of the piecemeal approach that has taken place so far. Large areas should be opened and any potential rampart lines should be thoroughly examined.

Appendix A

USING HISTORIC MAP OVERLAYS TO ANTICIPATE ARTIFACT DENSITY

David W. Lowe

Cultural Resources GIS of the National Park Service conducted a historic map overlay exercise to assist archeological fieldwork at Chalmette battlefield. The purpose of the exercise was to locate the focal point and approximate line of approach of the British attack of January 8, 1815 on the modern landscape according to cartographic sources. It was hoped that the exercise would allow archeologists to concentrate their efforts in productive areas.

Cultural Resources GIS has conducted many historic map overlays for Civil War battlefields and found it highly useful for locating surviving ground features. The success of this type of overlay, however, depends on several factors: the accuracy and internal consistency of the historic map; the operator's ability to correctly identify points on the historic map that correspond with modern terrain features; and the relative accuracy of the coordinates obtained for modern features. The first step in overlaying historic and modern data is to georeference the subject maps, that is, to assign spatial coordinates to features on the historic map. The paper map is scanned into a digital image that can be manipulated in a GIS program. Spatial coordinates of "real-world" features are assigned to corresponding pixels in the digital map to adjust the size and orientation of the image. By extrapolation, every pixel in the image is assigned coordinates relative to those provided. This results in a map image that has correspondence to the real world and can be integrated with modern map layers.

Since our focus was on battlefield maneuvers, we examined two available maps depicting troop positions and movements. The first was Arsène Lacarrière Latour's "Plan of an Attack made by the British Forces on the American Lines in advance of Orleans" (LOC #13577), originally published in 1816 as an engraving to illustrate *Historical Memoir of the War in West Florida and Louisiana in 1814-1815*. The engraving was based on an original survey map completed by Latour within weeks of the battle that has not been located. A second map, by John Reid, titled "Plan of Attack and Defense of the American Lines below New Orleans," was published as an engraving in 1817 in *The Life of Andrew Jackson*. The sources for this engraving were unclear, but Reid likely relied on his own sketches or maps. During this time period, it was not unusual for an engraver to sacrifice cartographic consistency to style. Latour, however, was chief engineer for the military district that included New Orleans, an accomplished cartographer, and principal architect of the defenses constructed on the battlefield. Reid, who also had cartographic training, served as an aide to General Jackson. As Latour and Reid were present at the Battle of New Orleans and since the maps were published so soon afterwards, it was assumed that an engraver was unlikely to introduce wholesale changes. Some cartographic integrity should remain.

This proved to be the case, although the Reid map suffered more severely at the engraver's hand. The intent of the two maps differs significantly. As an engineer, Latour wanted to show the effectiveness of his defenses, how American batteries countered British artillery, and how converging fires from the lines repulsed the assault. These were all indicated by narrow lines of fire directed outward from the defenses (Figure 44, detail). Latour stated that "In my plan of this affair, I have distinguished, by lines, and I venture to say, with the greatest exactness, both the extent and directions of our fire."[1] Reid, as Jackson's staff officer and biographer, was more concerned with showing the overall strategy of the battle. Reid shows defenses and maneuvers on both banks of the Mississippi and extends east to encompass the

British redoubts and camps. From an initial comparison, the Latour map was clearly the superior cartographic product. It retained a north arrow and a scale bar, both omitted from Reid. It focused on a smaller area of the battlefield north of the Mississippi River and showed greater clarity of detail. The Latour map made an attempt to realistically portray the tree line of the cypress swamps, for example, while the Reid map inserted stylized tree symbols. A cluster of seventeen buildings representing Chalmette Plantation on Latour was omitted entirely on Reid. It seems probable that the engraver "edited out" details of the landscape from his sources that did not seem important to the narrative or that seemed to clutter the map layout. As well, the smaller scale of the Reid map exerted pressure on the engraver to enlarge individual features relative to the landscape—structures, batteries, and earthworks—as to be immediately apparent to the viewer. For example, the American earthwork and Rodriguez Canal are depicted twice as wide on Reid as on the Latour map. The British batteries appear much larger on Reid than on Latour.

Both engravings incorporated conventions of "battle maps" of the time. Troops were shown as boxes that represented military units of uncertain and variable size, somewhere between company and battalion strength. Both maps appear to depict the British attack by replicating these unit boxes, suggesting a start line, the advance, and the closest approach to the American lines. Reid's map (Figure 45, detail) added dotted lines to suggest how these units moved across the battlefield. By breaking larger units into smaller ones and indicating more erratic movement, the map depicts the confusion of the retreating British ranks. We can assume this was not meant as a literal representation of the movement of specific units, but it accurately tells the story of the loss of unit cohesion among the British. Each of the maps, in its own way, accomplished the purpose for which it was produced. It remained to be seen how well each would correspond to the modern landscape.

The digital image of the Latour map was rotated 32 degrees clockwise so that the north arrow pointed to the top of the screen (true north in GIS). It was brought into ArcInfo in GRID format and tentatively displayed with modern coverages showing hydrology and transportation (1:24,000 scale). The riverbank as depicted on Latour closely paralleled the modern riverbank. The scale of the grid was then manipulated so that the scale bar measured yard for yard in exact terms and the whole shifted into position relative to the digital boundaries of the Chalmette park unit. As a quick check, the Macarty house appeared within Chalmette Slip, where it was known to have stood until 1907. We then sought a way to position the digital map relative to the river. Because levee construction or erosion had likely obliterated the original 1815 riverbank, the modern riverbank was unreliable for geo-referencing. We scanned a park map completed by Ted Birkedal, entitled "Revised Geography of Chalmette Battlefield." This map, which accompanied a battlefield resource study in 1985, was crafted from careful study of the documentation, including several historic maps thought more accurate than Latour's. In addition, Birkedal used the excavated location of Battery 3 for his computations. We aligned the Birkedal map with the modern road network and park boundaries and displayed it onscreen with the Latour map.[2]

At this point, it was discovered that the Latour map needed an additional two-degree clockwise rotation to match the oblique angle of the American defenses. As it occurs, the current magnetic declination for Chalmette is two degrees east. It is entirely possible that Latour's north arrow reflected magnetic north at the time, rather than true north. When this further rotation was completed, the Latour map fit rather precisely with the Birkedal map and both fit well within the parameters of the modern data. A distinctive feature of the American defenses was a curved indentation toward its northern end, dubbed the "inverted redan." Latour's depiction of the inverted redan lay directly over Birkedal's. Since we established scale for the Latour map independently before attempting an overlay, this offers confirmation of the accuracy of Birkedal's reconstruction. The right shoulder of the inverted redan began about twenty meters inside the northern boundary of the park and extended through the railroad right-of-way.

Working from both Latour and Birkedal, we established a scale and orientation for the Reid map. We assumed that if any feature on the Reid map were drawn to scale, it likely would be the depiction of the American line. The Reid map was rotated thirteen degrees clockwise and sized to fit along the American defenses from the riverbank to the inverted redan. Figure 46 shows the relative orientation and spatial extents of the two maps. (Latour is the smaller, above left.) Also shown on this figure is the modern course of the Mississippi River and Chalmette Slip (the narrow inlet on the north bank). The overlay shows that the downstream course of the Mississippi River has changed significantly since the time of the battle. The bank has been built up and a sharp bend eliminated. Cartographic research by Birkedal and Swanson confirmed that this buildup indeed had occurred, leaving plantation homes that once lined the riverbank far inland. Also apparent from this overly is that the engraver of the Reid map depicted the Mississippi River narrower than it truly is and was. This was probably done so that the entire battle area could be fit onto a smaller sheet of paper. In essence, the engraver deleted a strip about 225 meters wide from the middle of the river creating a seam in the map. To be of any use for ground survey, on the south bank, the map would need to be divided and the south bank area geo-referenced separately. Lacking confirmed locations on the south bank, we did not attempt this.

When features beyond the American defenses were compared, Latour and Reid diverged rather abruptly. Latour depicted two drainage ditches—395 and 605 meters east of the Rodriquez Canal—that seem to correspond with ditches on the Reid map. Both begin at about the same location at the edge of the swamp but diverge at different angles toward the river. The Reid map made these ditches parallel to the canal, which we subsequently determined was incorrect. Latour's ditches followed the correct angle based on property lines and the existing drainage. In fact, his farther ditch is parallel with and falls within about twenty meters of a modern ditch at the boundary of the national cemetery and may represent the same feature. The Reid map again appears to have suffered at the hands of an engraver who found it simpler to construct parallel lines than to reproduce the accurate angle from his source. Both maps show five British batteries, but there is little similarity in placement or shape, Reid's appearing more elaborate. Both maps place these batteries behind the far ditch, but because of its improper angles, Reid's lower batteries appear up to 170 meters closer to the American lines than they probably were. Only the battery adjacent to the Central Road has any correspondence between the maps. We concluded that Reid's batteries were for illustration, while Latour's were placed with some care because of the map's focus on engineering and artillery. Although researchers had expressed some hope of finding remains of the British batteries inside the National Cemetery, the Latour depiction places their locations squarely beneath the adjacent landfill. After completing the map overlay portion of the exercise within the scale of the available data, we examined the troop positions and maneuvers depicted on both maps. The main British assault was directed against the northern portion of the defenses. The columns skirted the dense cypress swamps and struck just to the south of the inverted redan. A secondary assault column attacked along the river levee and briefly overran a battery there. Overlaying Latour's troop positions on the Reid map, we see that only sixty meters separate Latour's main assault column and Reid's as these approached the canal (Figure 47) This was surprising agreement considering the differing scales of the engraved maps. Accounts confirm (and both maps show) that this assault was made on a very narrow front—less than 200 meters wide. In this context, the assault columns as shown on the two maps, when combined, are a little more than 100 meters wide. We were now confident that the focal point of the British assault could be closely circumscribed.

Our initial overlay map of the interaction of firepower and targets (Figure 48) encompassed the troop positions shown on Latour and Reid but relied too heavily upon Latour's claim of "the greatest exactness" in laying down the extent and directions of fire. His lines of fire extended out-

ward from the parapet only about 350 meters. Within the three reddish zones defined on the map, we anticipated a gradient of artifacts, increasing in proximity, density, and diversity as the assault columns approached the American defenses. This map proved sufficient to focus attention on a small area of the park, north of the loop road where the initial artifacts were discovered. As it turned out, 65 percent of the battle-related artifacts were found within 50 meters of this rough overlay. (Figure 49) Surprisingly, many more artifacts were discovered beyond 350 meters than anticipated.

We afterwards developed a more theoretical overlay map based on the ranges of the weapons. Although some American cannons had ranges of two miles, fire against an infantry assault would have been effective only within line-of-sight, estimated about 500 meters in this case. Artillery at this range fired solid shot or shrapnel at massed targets of opportunity (represented by the troop boxes on the Reid and Latour maps). As the British came forward, fire from the American batteries in the defenses would have targeted the head and flanks of the columns. Within about 300 meters, the artillerists would have shifted to canister and infantrymen with long-range rifles would have opened fire. Theoretically, this firing would converge and intensify with every forward step until the attackers came within the last 100 meters. At this point, in addition to canister, the infantrymen would have volleyed with smoothbore muskets firing buck-and-ball. All weapons along several hundred meters of the parapet would have converged on the columns.

These assumptions, based on common practice (with support from the documentary sources), yielded three zones, reaching outward from the American line to 100, 300, and 500 meters and encompassing the areas of the principal assault columns as depicted on both maps. Zone 1 represented longer range artillery firing—solid shot and shrapnel—with evidence of impacts—accoutrements, dropped ammunition and equipment. In Zone 2 solid shot should decline and canister intensify, fired rifle balls and impact evidence should intensify. Zone 3 should contain evidence of the climactic struggle—canister, fired rifle balls, fired musket balls with buckshot, and most evidence of impacts. To reproduce this model in GIS, we generated two coverages—one representing the three zones of fire plotted for the entire line of the American defenses, the second circumscribing an area around the troop positions shown on the maps. The unit boxes on the historic maps were buffered by an additional 20 meters to provide some latitude for scale and distortion. By intersecting these two areas, we created a third coverage that was intended to represent the interaction of fire and targets on the battlefield. This coverage was then layered over a map of artifact locations. (Figure 50) By a preliminary count, nearly 85 percent of the battle-related artifacts discovered on Chalmette battlefield fell within fifty meters of zones one, two, and three of the theoretical model. (Figure 51)

Although this percentage would appear to confirm assumptions underlying the revised model, artifact density did not increase with proximity to the parapet but was more evenly distributed across the zones. In context of what is known about the main British assault at Chalmette, such an even distribution was highly unlikely and may reflect depletion of the archeological record by artifact collectors who concentrated their efforts in the vicinity of the parapet. Overall, we considered this map exercise useful for locating the general area of the British assault at Chalmette. There seems little doubt that the most severe fighting on the battlefield occurred in the area indicated by the historic map overlay. Confirmation and further revision of the three-zone field-of-fire model, however, may need to be postponed until a less disturbed site can be examined.

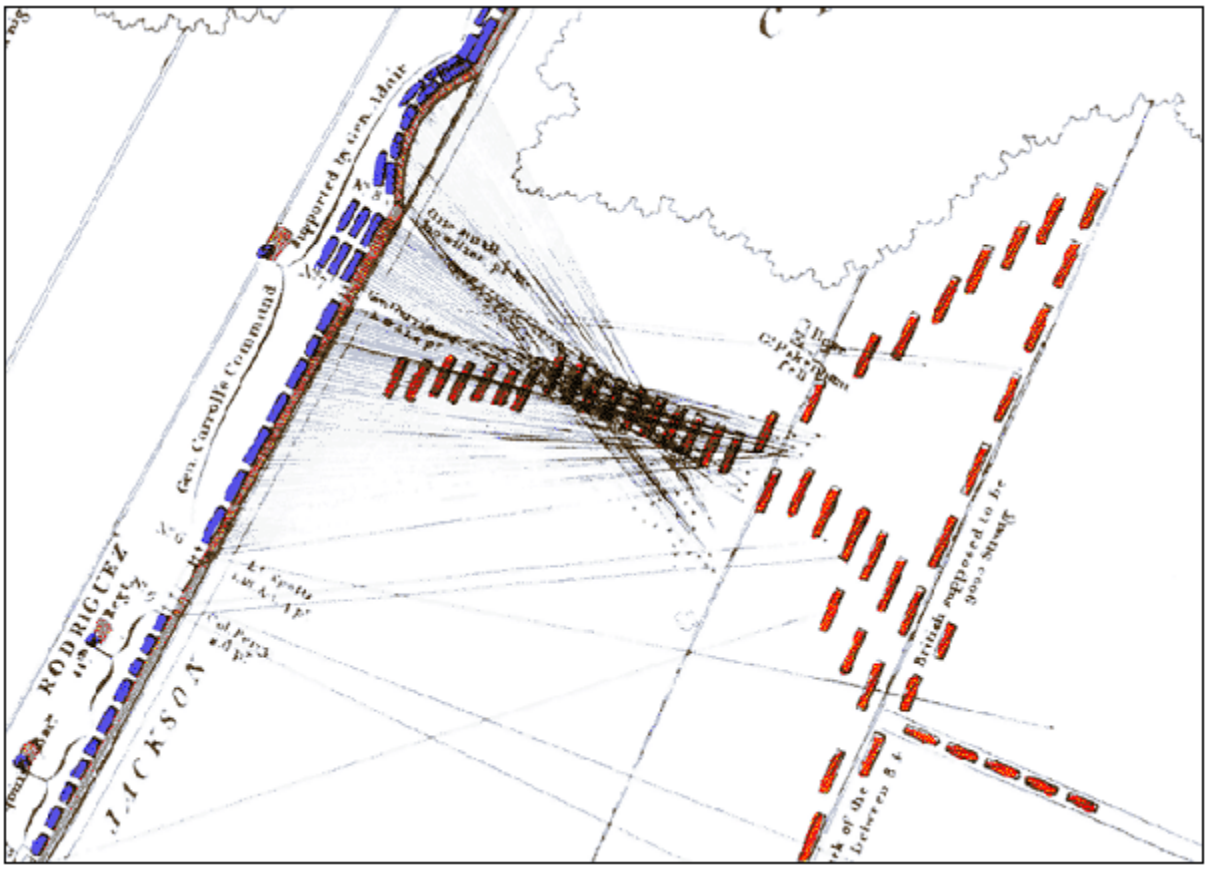


Figure 44. Detail from the Latour map showing converging lines of fire.

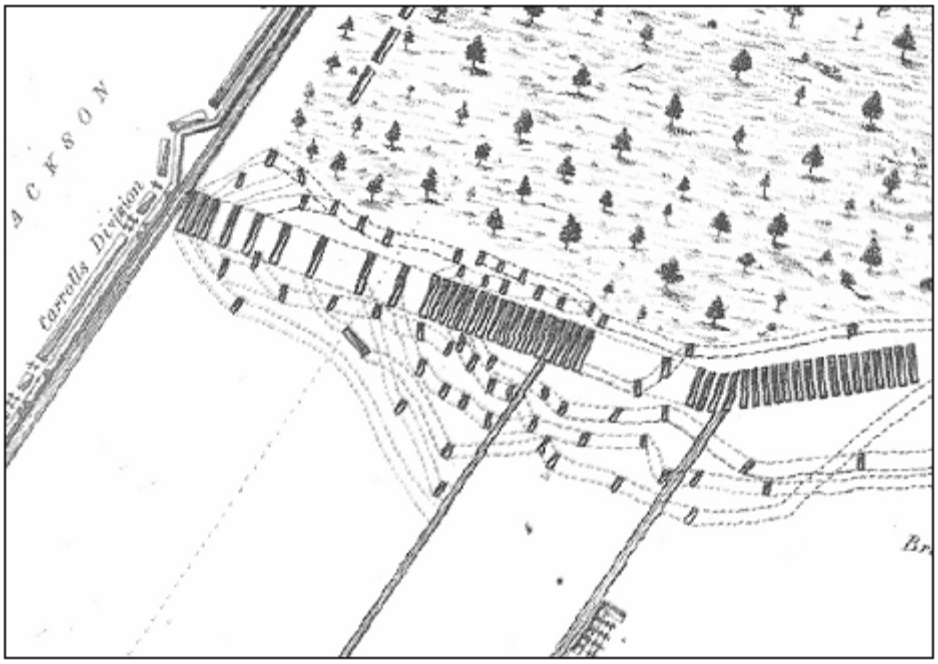


Figure 45. Detail from the Reid map showing lines of troop movement and break down of unit cohesion after the repulse.

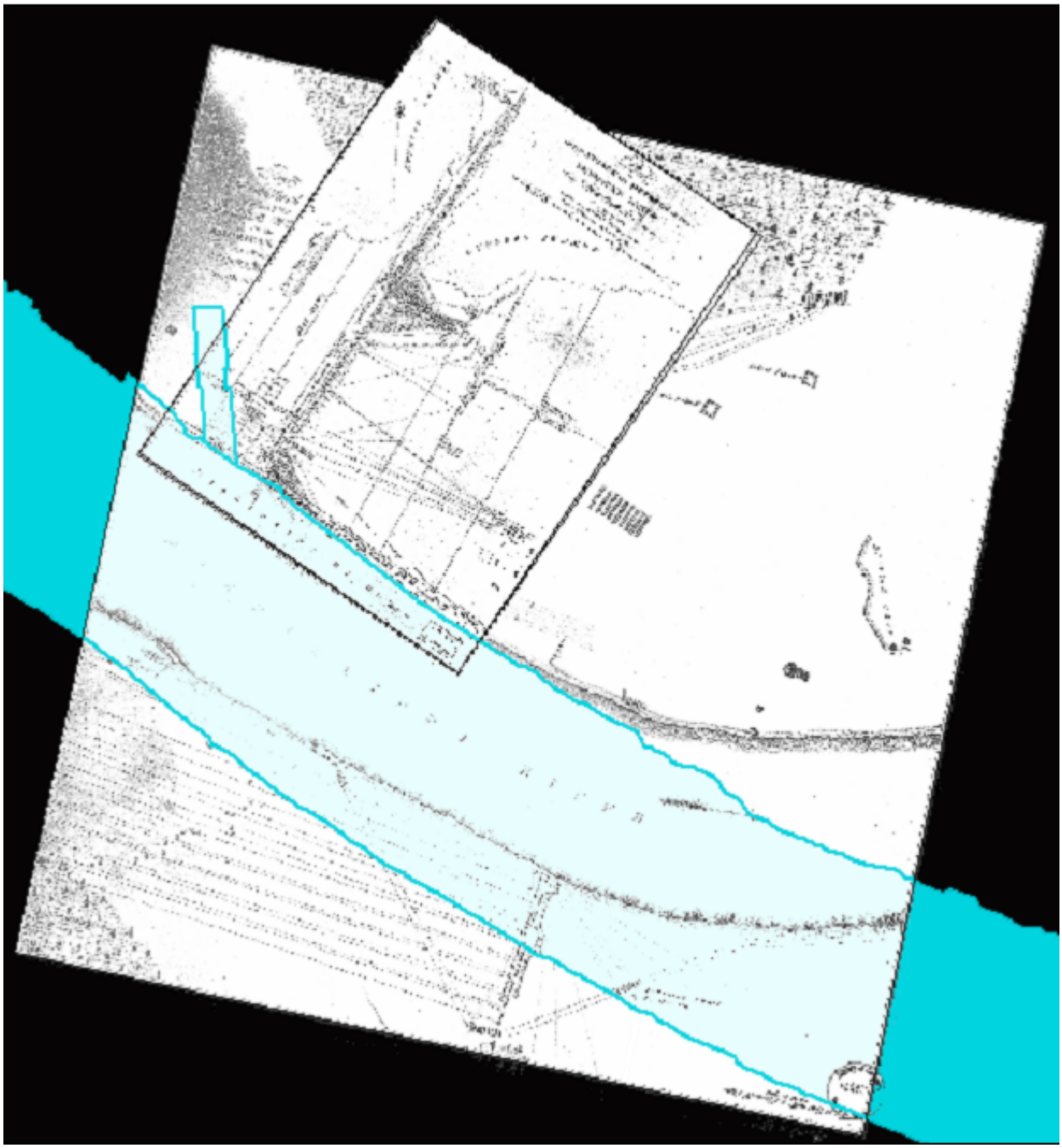


Figure 46. Overlays of Latour and Reid maps with modern course of the Mississippi River.

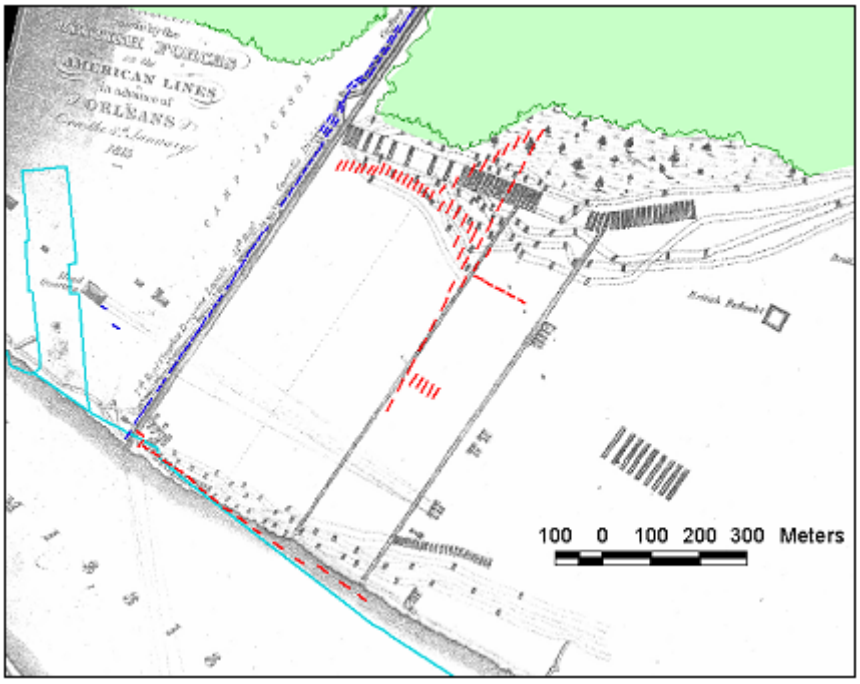


Figure 47. British (red) and American troops (blue) from Latour superimposed on the Reid map. Green area is the cypress swamp from Latour. Only sixty meters separate the focal points of the depicted assaults.

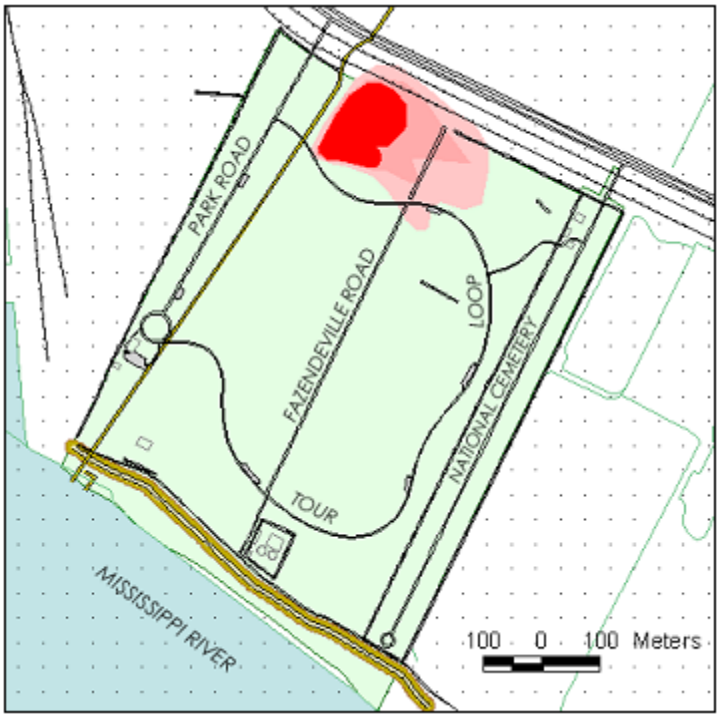


Figure 48. Model of anticipated density of artifacts for the main assault based on the Latour and Reid maps (red). Green area is the Chalmette unit.

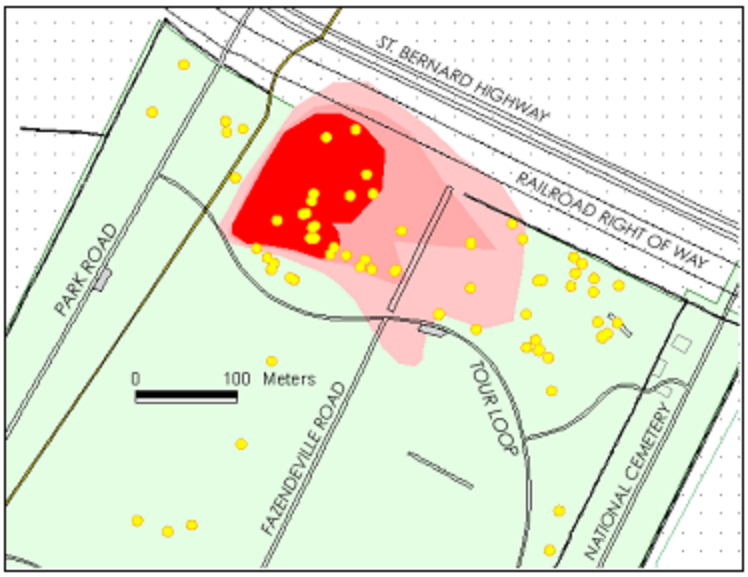


Figure 49. Actual artifact distribution (yellow) compared to original model (red). Sixty-five percent of recovered artifacts were found within 50 meters of the model area.

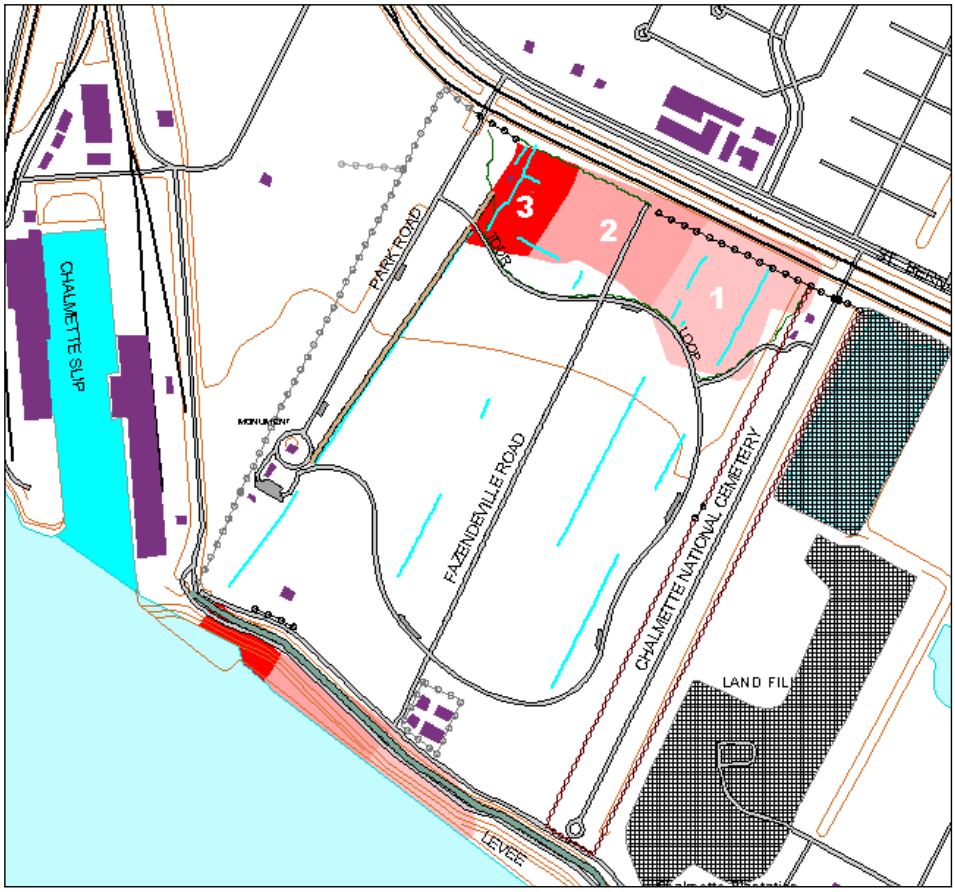


Figure 50. Revised model of anticipated artifact density based on effective ranges of weapons.

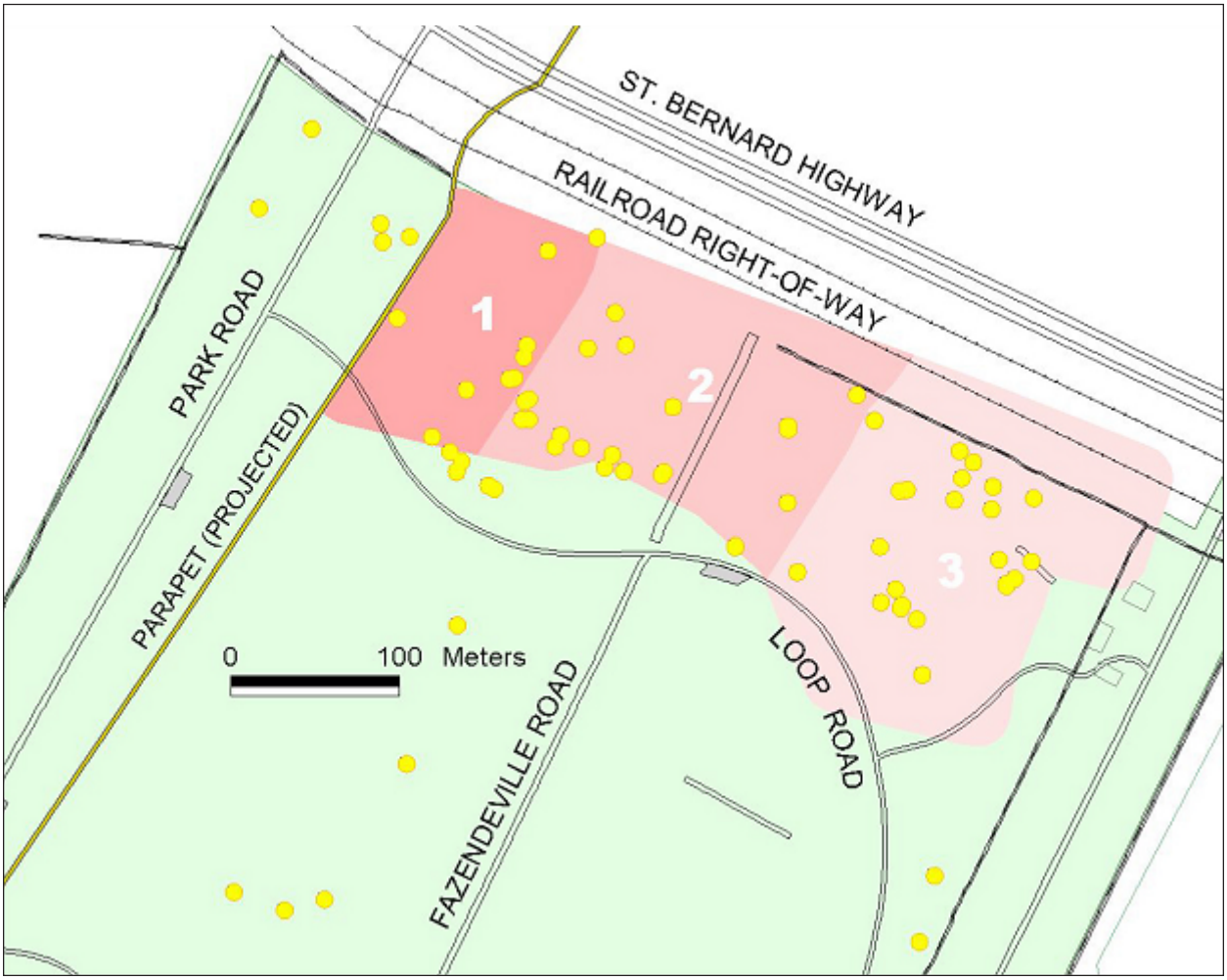


Figure 51. Eighty-six percent of battle-related artifacts were found within 50 meters of Zones 1, 2, and 3 in the revised model based upon weapon ranges.

Appendix B

CATALOG OF ARTIFACTS

Lot: 1.00001
Catalog: JELAC 3565
Count: BAG
Wt: 0.44 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Ostreidae.
Taxon: Crassostrea virginica. (Eastern Oyster).

Lot: 1.00002
Catalog: JELAC 3566
Count: BAG
Wt: 0.53 G
Object: Brick.
Material: Clay.

Lot: 2.00001
Catalog: JELAC 3567
Count: 1 EA
Wt: 3.09 G
Object: Plastic fragment.
Material: Plastic.

Lot: 3.00001
Catalog: JELAC 3568
Count: BAG
Wt: 1.23 G
Object: Brick.
Material: Clay.

Lot: 3.00002
Catalog: JELAC 3569
Count: BAG
Wt: 12.95 G
Object: Coal fragment.
Material: Coal.

Lot: 4.00001
Catalog: JELAC 3575
Count: BAG
Wt: 67.20 G
Object: Mortar.
Material: Mortar.

Lot: 4.00002
Catalog: JELAC 3576
Count: BAG
Wt: 18.79 G
Object: Brick.
Material: Clay.

Lot: 4.00003 Catalog: JELAC 3577
Count: BAG
Wt: 1.39 G
Object: Cinder.
Material: Coal.

Lot: 5.00001
Catalog: JELAC 3578
Count: BAG
Wt: 0.92 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Bivalvia.

Lot: 5.00002
Catalog: JELAC 3579
Count: BAG
Wt: 4.70 G
Object: Metal fragment.
Material: Iron.

Lot: 5.00003
Catalog: JELAC 3580
Count: BAG
Wt: 8.54 G
Object: Brick.
Material: Clay.

Lot: 5.00004
Catalog: JELAC 3581
Count: 1 EA
Wt: 2.44 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 5.00005
Catalog: JELAC 3582
Count: 2 EA
Wt: 0.38 G
Object: Lid.
Material: Plastic.

Lot: 6.00001
Catalog: JELAC 3583
Count: 1 EA
Wt: 1.98 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 7.00001
Catalog: JELAC 3584
Count: BAG
Wt: 6.84 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 7.00002
Catalog: JELAC 3585
Count: 5 EA
Wt: 32.93 G
Object: Staple, fence.
Material: Steel.

Lot: 7.00003
Catalog: JELAC 3586
Count: EA
Wt: 27.61 G
Object: Wire, barbed.
Material: Steel.

Lot: 7.00004
Catalog: JELAC 3587
Count: 1 EA
Wt: 70.26 G
Object: Furnace.
Material: Iron.
Material: Copper Alloy.

Lot: 8.00001
Catalog: JELAC 3589
Count: BAG
Wt: 0.70 G
Object: Cinder.
Material: Coal.

Lot: 8.00002
Catalog: JELAC 3590
Count: 1 EA
Wt: 0.85 G
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 9.00001
Catalog: JELAC 3591
Count: BAG
Wt: 43.60 G
Object: Brick.
Material: Clay.

Lot: 9.00002
Catalog: JELAC 3592
Count: BAG
Wt: 1.80 G
Object: Cinder.
Material: Coal.

Lot: 9.00003
Catalog: JELAC 3593
Count: BAG
Wt: 30.25 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
HCO: Bivalvia.

Lot: 9.00004
Catalog: JELAC 3594
Count: BAG
Wt: 67.10 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 9.00005
Catalog: JELAC 3595
Count: 8 EA
Wt: 5.90 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Mammalia.

Lot: 9.00006
Catalog: JELAC 3596
Count: 1 EA
Wt: 0.64 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 9.00007
Catalog: JELAC 3597
Count: 1 EA
Wt: 0.39 G
Object: Glass fragment. Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 9.00008
Catalog: JELAC 3598
Count: 3 EA
Wt: 0.33 G
Object: Grommet.
Material: Brass.
Material: Plastic.

Lot: 10.00001
Catalog: JELAC 3599
Count: 1 EA
Wt: 0.86 G
Object: Plastic fragment.
Material: Plastic.

Lot: 11.00001
Catalog: JELAC 3744
Count: 1 EA
Wt: 7.80 G
Object: Bottle.
Material: Glass.
Typology: Container Glass.

Lot: 11.00002
Catalog: JELAC 3745
Count: 1 EA
Wt: 1.33 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 11.00003
Catalog: JELAC 3746
Count: 1 EA
Wt: 1.15 G
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 11.00004
Catalog: JELAC 3747
Count: 2 EA
Wt: 6.06 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 11.00005
Catalog: JELAC 3748
Count: 2 EA
Wt: 1.96 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 11.00006
Catalog: JELAC 3749
Count: 1 EA
Wt: 15.91 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 11.00007
Catalog: JELAC 3750
Count: 2 EA
Wt: 1.40 G
Object: Plastic fragment.
Material: Plastic.

Lot: 11.00008
Catalog: JELAC 3751
Count: BAG
Wt: 3.21 G
Object: Slag.
Material: Slag.

Lot: 11.00009
Catalog: JELAC 3752
Count: BAG
Wt: 5.13 G
Object: Mortar.
Material: Mortar.

Lot: 11.00010
Catalog: JELAC 3753
Count: BAG
Wt: 113.3 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Ostreidae.
Taxon: Crassostrea virginica. (Eastern Oyster).

Lot: 12.00001
Catalog: JELAC 3754
Count: 1 EA
Wt: 12.10 G
Object: Bottle.
Material: Glass.
Typology: Container Glass.
Typology: Finish, Two Part.

Lot: 12.00002
Catalog: JELAC 3755
Count: 1 EA
Wt: 3.14 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 12.00003
Catalog: JELAC 3756
Count: 1 EA
Wt: 3.80 G
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 12.00004 Catalog: JELAC 3757
Count: 5 EA Wt: 3.36 G
Object: Vessel fragment. Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 12.00005
Catalog: JELAC 3758
Count: 1 EA
Wt: 1.38 G
Object: Stone, building.
Material: Slate.

Lot: 12.00006
Catalog: JELAC 3759
Count: 1 EA
Wt: 10.49 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 12.00007
Catalog: JELAC 3760
Count: BAG
Wt: 73.20 G
Object: Brick.
Material: Clay.

Lot: 13.00001
Catalog: JELAC 3761
Count: 1 EA
Wt: 1.14 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 13.00002
Catalog: JELAC 3762
Count: 1 EA
Wt: 4.13 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 13.00003
Catalog: JELAC 3763
Count: 1 EA
Wt: 8.97 G
Object: Glass fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 13.00004
Catalog: JELAC 3764
Count: 1 EA
Wt: 0.86 G
Object: Vessel fragment.
Material: Clay.
Type: Porcelain.
Typology: Porcelain.

Lot: 13.00005
Catalog: JELAC 3765
Count: 2 EA
Wt: 7.67 G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 13.00006
Catalog: JELAC 3766
Count: BAG
Wt: 56.85 G
Object: Brick.
Material: Clay.

Lot: 13.00007
Catalog: JELAC 3767
Count: BAG
Wt: 41.87 G
Object: Mortar.
Material: Mortar.

Lot: 13.00008
Catalog: JELAC 3768
Count: 1 EA
Wt: 2.03 G
Object: Screw.
Material: Copper Alloy.
Typology: Screw.

Lot: 13.00009
Catalog: JELAC 3769
Count: 4 EA
Wt: 28.43 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 13.00010
Catalog: JELAC 3770
Count: 2 EA
Wt: 3.87 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Mammalia.

Lot: 13.00011
Catalog: JELAC 3771
Count: 5 EA
Wt: 1.31 G
Object: Wrapper.
Material: Plastic.

Lot: 13.00012
Catalog: JELAC 3772
Count: 1 EA
Wt: 2.08 G
Object: Plastic fragment.
Material: Plastic.

Lot: 13.00013
Catalog: JELAC 3773
Count: BAG
Wt: 60.88 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 14.00001
Catalog: JELAC 3774
Count: 1 EA
Wt: 0.52 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 14.00002
Catalog: JELAC 3775
Count: 7 EA
Wt: 23.73 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 14.00003
Catalog: JELAC 3776
Count: 1 EA
Wt: 3.98 G
Object: Vessel fragment
Material: Clay
Type: Whiteware
Typology: Earthenware, Refined, Whiteware

Lot: 14.00004
Catalog: JELAC 3777
Count: 1 EA
Wt: 2.09 G
Object: Vessel fragment
Material: Clay
Type: Whiteware
Typology: Earthenware, Refined, Whiteware.

Lot: 14.00005
Catalog: JELAC 3778
Count: 2 EA
Wt: 5.65 G
Object: Screw.
Material: Ferrous Metal.
Typology: Screw.

Lot: 14.00006
Catalog: JELAC 3779
Count: 1 EA
Wt: 0.37 G
Object: Stone, building.
Material: Slate.

Lot: 14.00007
Catalog: JELAC 3780
Count: BAG
Wt: 0.12 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 14.00008
Catalog: JELAC 3781
Count: BAG
Wt: 1.64 G
Object: Concretion.
Material: Ferrous Metal.

Lot: 14.00009
Catalog: JELAC 3782
Count: BAG
Wt: 184.3 G
Object: Brick.
Material: Clay.

Lot: 15.00001
Catalog: JELAC 3783
Count: 2 EA
Wt: 1.97 G
Object: Vessel fragment.
Material: Clay.
Type: Porcelain.
Typology: Porcelain.

Lot: 15.00002
Catalog: JELAC 3784
Count: 5 EA
Wt: 19.74 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 15.00003
Catalog: JELAC 3785
Count: 7 EA
Wt: 59.05 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00004
Catalog: JELAC 3786
Count: 1 EA
Wt: 0.41
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 15.00005 Catalog: JELAC 3787
Count: 3 EA
Wt: 17.20 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00006
Catalog: JELAC 3788
Count: 1 EA
Wt: 0.54 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00007
Catalog: JELAC 3789
Count: 1 EA
Wt: 2.76 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00008
Catalog: JELAC 3790
Count: 2 EA
Wt: 4.55 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00009
Catalog: JELAC 3791
Count: 1 EA
Wt: 0.23 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00010
Catalog: JELAC 3792
Count: 2 EA
Wt: 5.87 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00011
Catalog: JELAC 3793
Count: 1 EA
Wt: 0.69 G
Object: Button.
Material: Bone.
Typology: Button, Single Component.

Lot: 15.00012
Catalog: JELAC 3794
Count: 1 EA
Wt: 2.48 G
Object: Cap, bottle.
Material: Aluminum.

Lot: 15.00013
Catalog: JELAC 3795
Count: 2 EA
Wt: 3.99 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 15.00014
Catalog: JELAC 3796
Count: 2 EA
Wt: 19.53 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 15.00015
Catalog: JELAC 3797
Count: 12 EA
Wt: 20.47 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 15.00016
Catalog: JELAC 3798
Count: 1 EA
Wt: 5.10 G
Object: Screw.
Material: Iron.
Typology: Screw.

Lot: 15.00017
Catalog: JELAC 3799
Count: 1 EA
Wt: 60.71 G
Object: Sparkplug.
Material: Aluminum.
Material: Clay.
Material: Steel.
Material: Copper Alloy.

Lot: 15.00018
Catalog: JELAC 3800
Count: BAG
Wt: 12.50 G
Object: Cinder.
Material: Coal.

Lot: 15.00019
Catalog: JELAC 3801
Count: BAG
Wt: 9.62 G
Object: Mortar.
Material: Mortar.

Lot: 15.00020
Catalog: JELAC 3802
Count: BAG
Wt: 9.91 G
Object: Concrete fragment.
Material: Cement.

Lot: 15.00021
Catalog: JELAC 3803
Count: BAG
Wt: 1.16 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 15.00022
Catalog: JELAC 3804
Count: 1 EA
Wt: 9.08 G
Object: Stone, building.
Material: Slate.

Lot: 15.00023
Catalog: JELAC 3805
Count: 1 EA
Wt: 0.62 G
Object: Shingle.
Material: Synthetic.

Lot: 15.00024
Catalog: JELAC 3806
Count: BAG
Wt: 91.82 G
Object: Brick.
Material: Clay.

Lot: 15.00025
Catalog: JELAC 3807
Count: 2 EA
Wt: 1.71 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Testudines.

Lot: 15.00026
Catalog: JELAC 3808
Count: 19 EA
Wt: 22.92 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Mammalia.

Lot: 15.00027
Catalog: JELAC 3809
Count: 87 EA
Wt: 206.0 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00028
Catalog: JELAC 3810
Count: 1 EA
Wt: 0.95 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00029
Catalog: JELAC 3811
Count: 7 EA
Wt: 16.62 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00030
Catalog: JELAC 3812
Count: 1 EA
Wt: 2.16 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 15.00031
Catalog: JELAC 3813
Count: 2 EA
Wt: 5.41 G
Object: Bottle.
Material: Glass.
Typology: Container Glass.

Lot: 15.00032
Catalog: JELAC 3814
Count: 2 EA
Wt: 2.84 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 16.00001
Catalog: JELAC 3815
Count: 1 EA
Wt: 0.13 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Vertebrata.

Lot: 17.00001
Catalog: JELAC 3816
Count: 2 EA
Wt: 5.48 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 17.00002
Catalog: JELAC 3817
Count: 1 EA
Wt: 1.15 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 17.00003
Catalog: JELAC 3818
Count: 1 EA
Wt: 0.35 G
Object: Vessel fragment.
Material: Clay.
Type: Porcelain.
Typology: Porcelain.

Lot: 17.00004
Catalog: JELAC 3819
Count: BAG
Wt: 6.06 G
Object: Brick.
Material: Clay.

Lot: 17.00005
Catalog: JELAC 3820
Count: 1 EA
Wt: 32.90 G
Object: Nut.
Material: Iron.
Typology: Nut.

Lot: 17.00006
Catalog: JELAC 3821
Count: 1 EA
Wt: 2.30 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Mammalia.

Lot: 18.00001
Catalog: JELAC 3822
Count: 1 EA
Wt: 1.17 G
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 18.00002
Catalog: JELAC 3823
Count: 1 EA
Wt: 0.21 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 18.00003
Catalog: JELAC 3824
Count: BAG
Wt: 112.8 G
Object: Brick.
Material: Clay.

Lot: 19.00001
Catalog: JELAC 3825
Count: 1 EA
Wt: 0.87 G
Object: Food, bone.
Material: Fauna Remains.
Material: Bone.
HCO: Vertebrata.

Lot: 20.00001
Catalog: JELAC 3826
Count: BAG
Wt: 3.05 G
Object: Cinder.
Material: Coal.

Lot: 20.00002
Catalog: JELAC 3827
Count: BAG
Wt: 2.67 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Bivalvia.

Lot: 21.00001
Catalog: JELAC 3828
Count: 1 EA
Wt: 1.38 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 22.00001
Catalog: JELAC 3829
Count: BAG
Wt: 17.27 G
Object: Mortar.
Material: Mortar.

Lot: 22.00002
Catalog: JELAC 3830
Count: BAG
Wt: 1.76 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
HCO: Bivalvia.

Lot: 22.00003
Catalog: JELAC 3831
Count: BAG
Wt: 20.67 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 22.00004
Catalog: JELAC 3832
Count: BAG
Wt: 113.1 G
Object: Brick.
Material: Clay.

Lot: 22.00005
Catalog: JELAC 3833
Count: 1 EA
Wt: 54.15 G
Object: Tile.
Material: Clay.

Lot: 22.00006
Catalog: JELAC 3834
Count: 4 EA
Wt: 4.67 G
Object: Tile, roof.
Material: Asbestos.

Lot: 23.00001
Catalog: JELAC 3835
Count: BAG
Wt: 6.33 G
Object: Brick.
Material: Clay.

Lot: 23.00002
Catalog: JELAC 3836
Count: 1 EA
Wt: 4.72 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 24.00001
Catalog: JELAC 3837
Count: BAG
Wt: 0.23 G
Object: Cinder.
Material: Coal.

Lot: 24.00002
Catalog: JELAC 3838
Count: BAG
Wt: 18.58 G
Object: Brick.
Material: Clay.

Lot: 24.00003
Catalog: JELAC 3839
Count: 1 EA
Wt: 0.58 G
Object: Tile, roof.
Material: Asbestos.

Lot: 24.00004
Catalog: JELAC 3840
Count: 1 EA
Wt: 8.37 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 24.00005
Catalog: JELAC 3841
Count: 1 EA
Wt: 2.40 G
Object: Nail.
Material: Iron.

Lot: 25.00001
Catalog: JELAC 3842
Count: BAG
Wt: 5.68 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
HCO: Bivalvia.

Lot: 25.00002
Catalog: JELAC 3843
Count: BAG
Wt: 5.07 G
Object: Brick.
Material: Clay.

Lot: 26.00001
Catalog: JELAC 3844
Count: 6 EA
Wt: 13.78 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 26.00002
Catalog: JELAC 3845
Count: 5 EA
Wt: 24.77 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 27.00001
Catalog: JELAC 3846
Count: BAG
Wt: 2.25 G
Object: Mortar.
Material: Mortar.

Lot: 27.00002
Catalog: JELAC 3847
Count: 4 EA
Wt: 0.49 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Mammalia.

Lot: 27.00003
Catalog: JELAC 3848
Count: 2 EA
Wt: 13.17 G
Object: Vessel fragment.
Material: Clay.
Type: Blue Shell Edged Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 27.00004
Catalog: JELAC 3849
Count: BAG
Wt: 72.65 G
Object: Brick.
Material: Clay.

Lot: 27.00005
Catalog: JELAC 3850
Count: 1 EA
Wt: 0.77 G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 27.00006
Catalog: JELAC 3851
Count: 1 EA
Wt: 4.84 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 27.00007
Catalog: JELAC 3852
Count: 4 EA
Wt: 27.02 G
Object: Vessel fragment.
Material: Clay.
Type: Refined Redware.
Typology: Earthenware, Refined, Redware.

Lot: 28.00001
Catalog: JELAC 3853
Count: 1 EA
Wt: 0.49 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 29.00001
Catalog: JELAC 3854
Count: BAG
Wt: 10.35 G
Object: Metal fragment.
Material: Iron.

Lot: 30.00001
Catalog: JELAC 3855
Count: 1 EA
Wt: 1.59 G
Object: Vessel fragment.
Material: Clay.
Type: Untyped.
Typology: Earthenware, Coarse, Native American.
Culture: Native American

Lot: 31.00001
Catalog: JELAC 3856
Count: 3 EA
Wt: 13.92 G
Object: Staple, fence.
Material: Steel.

Lot: 31.00002
Catalog: JELAC 3857
Count: 8 EA
Wt: 13.75 G
Object: Wire, barbed. Material: Steel.

Lot: 32.00001
Catalog: JELAC 3858
Count: BAG
Wt: 5.56 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 32.00002
Catalog: JELAC 3859
Count: 1 EA
Wt: 3.38 G
Object: Washer.
Material: Iron.

Lot: 32.00003
Catalog: JELAC 3860
Count: 2 EA
Wt: 2.08 G
Object: Wire, barbed.
Material: Steel.

Lot: 33.00001
Catalog: JELAC 3861
Count: 1 EA
Wt: 2.72 G
Object: Shell, shotgun.
Material: Brass.
Typology: Shotgun.

Lot: 34.00001
Catalog: JELAC 3862
Count: 1 EA
Wt: 29.72 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 35.00001
Catalog: JELAC 3863
Count: 1 EA
Wt: 0.95 G
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 36.00001
Catalog: JELAC 3864
Count: 1 EA
Wt: 1.16 G
Object: Vessel fragment.
Material: Clay.
Type: Untyped.
Typology: Earthenware, Coarse, Native American.
Culture: Native American

Lot: 36.00002
Catalog: JELAC 3865
Count: 1 EA
Wt: 4.15 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 37.00001
Catalog: JELAC 3866
Count: 1 EA
Wt: 20.84 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 38.00001
Catalog: JELAC 3867
Count: BAG
Wt: 0.31 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 38.00002
Catalog: JELAC 3868
Count: BAG
Wt: 27.91 G
Object: Brick.
Material: Clay.

Lot: 38.00003
Catalog: JELAC 3869
Count: 1 EA
Wt: 5.42 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 38.00004
Catalog: JELAC 3870
Count: 3 EA
Wt: 1.17 G
Object: Wire.
Material: Metal.

Lot: 39.00001
Catalog: JELAC 3871
Count: BAG
Wt: 433.1 G
Object: Asphalt fragment.
Material: Asphalt.

Lot: 39.00002
Catalog: JELAC 3872
Count: BAG
Wt: 9.18 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
HCO: Ostreidae.
Taxon: Crassostrea virginica. (Eastern Oyster).

Lot: 39.00003
Catalog: JELAC 3873
Count: BAG
Wt: 0.84 G
Object: Brick.
Material: Clay.

Lot: 40.00001
Catalog: JELAC 3874
Count: 1 EA
Wt: 1.95 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 40.00002
Catalog: JELAC 3875
Count: 1 EA
Wt: 2.94 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 40.00003
Catalog: JELAC 3876
Count: 1 EA
Wt: 1.27 G
Object: Glass fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 40.00004
Catalog: JELAC 3877
Count: 2 EA
Wt: 2.62 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 40.00005
Catalog: JELAC 3878
Count: 2 EA
Wt: 3.67 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 40.00006
Catalog: JELAC 3879
Count: 1 EA
Wt: 4.19 G
Object: Marble.
Material: Kaolinite Clay.
Typology: Pipe Clay.

Lot: 40.00007
Catalog: JELAC 3880
Count: 11 EA
Wt: 52.98 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 40.00008
Catalog: JELAC 3881
Count: 8 EA
Wt: 21.54 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 40.00009
Catalog: JELAC 3882
Count: 1 EA
Wt: 9.94 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 40.00010
Catalog: JELAC 3883
Count: BAG
Wt: 57.22 G
Object: Metal fragment.
Material: Iron.

Lot: 40.00011
Catalog: JELAC 3884
Count: BAG
Wt: 56.20 G
Object: Concretion.
Material: Ferrous Metal.

Lot: 40.00012
Catalog: JELAC 3885
Count: 1 EA
Wt: 0.65 G
Object: Vessel fragment.
Material: Clay.
Type: Blue Shell Edged Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 40.00013
Catalog: JELAC 3886
Count: 1 EA
Wt: 1.45 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 40.00014
Catalog: JELAC 3887
Count: BAG
Wt: 3.02 G
Object: Wood fragment.
Material: Wood.

Lot: 40.00015
Catalog: JELAC 3888
Count: BAG
Wt: 0.52 G
Object: Plaster.
Material: Plaster.

Lot: 40.00016
Catalog: JELAC 3889
Count: 15 EA
Wt: 82.24 G
Object: Stone, building.
Material: Slate.

Lot: 40.00017
Catalog: JELAC 3890
Count: BAG
Wt: 27.28 G
Object: Cinder.
Material: Coal.

Lot: 40.00018
Catalog: JELAC 3891
Count: BAG
Wt: 56.39 G
Object: Asphalt fragment.
Material: Asphalt.

Lot: 40.00019
Catalog: JELAC 3892
Count: BAG
Wt: 506.2 G
Object: Concrete fragment.
Material: Cement.

Lot: 40.00020
Catalog: JELAC 3893
Count: BAG
Wt: 1884. G
Object: Brick.
Material: Clay.

Lot: 41.00001
Catalog: JELAC 3894
Count: BAG
Wt: 7.46 G
Object: Slag.
Material: Slag.

Lot: 42.00001
Catalog: JELAC 3895
Count: 1 EA
Wt: 23.48 G
Object: Bottle.
Material: Glass.
Typology: Container Glass.
Typology: Finish, Two Part.

Lot: 42.00002
Catalog: JELAC 3896
Count: 3 EA
Wt: 5.07 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 42.00003
Catalog: JELAC 3897
Count: 2 EA
Wt: 17.56 G
Object: Glass fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 42.00004
Catalog: JELAC 3898
Count: 1 EA
Wt: 1.24 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 42.00005
Catalog: JELAC 3899
Count: 1 EA
Wt: 2.48 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 42.00006
Catalog: JELAC 3900
Count: 1 EA
Wt: 28.88 G
Object: Vessel fragment.
Material: Clay.
Type: Salt Glazed Stoneware.
Typology: Stoneware, Coarse.

Lot: 42.00007
Catalog: JELAC 3901
Count: 3 EA
Wt: 16.74 G
Object: Vessel fragment.
Material: Clay.
Type: Porcelain.
Typology: Porcelain.

Lot: 42.00008
Catalog: JELAC 3902
Count: 4 EA
Wt: 12.53 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 42.00009
Catalog: JELAC 3903
Count: 1 EA
Wt: 112.7 G
Object: Horseshoe.
Material: Iron.

Lot: 42.00010
Catalog: JELAC 3904
Count: 2 EA
Wt: 7.85 G
Object: Wire.
Material: Metal.

Lot: 42.00011
Catalog: JELAC 3905
Count: BAG
Wt: 43.90 G
Object: Metal fragment.
Material: Iron.

Lot: 42.00012
Catalog: JELAC 3906
Count: BAG
Wt: 63.21 G
Object: Concretion.
Material: Ferrous Metal.

Lot: 42.00013
Catalog: JELAC 3907
Count: BAG
Wt: 66.06 G
Object: Concrete fragment.
Material: Cement.

Lot: 42.00014
Catalog: JELAC 3908
Count: 5 EA
Wt: 17.38 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 42.00015
Catalog: JELAC 3909
Count: 17 EA
Wt: 54.09 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 42.00016
Catalog: JELAC 3910
Count: 11 EA
Wt: 34.70 G
Object: Nail.
Material: Iron.

Lot: 42.00017
Catalog: JELAC 3911
Count: 7 EA
Wt: 31.30 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 42.00018
Catalog: JELAC 3912
Count: 3 EA
Wt: 13.77 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 42.00019
Catalog: JELAC 3913
Count: 1 EA
Wt: 0.62 G
Object: Case, cartridge.
Material: Brass.
Typology: Rimfire.

Lot: 42.00020
Catalog: JELAC 3914
Count: 3 EA
Wt: 39.38 G
Object: Food, bone.
Material: Fauna Remains.
Material: Bone.
HCO: Mammalia.

Lot: 42.00021
Catalog: JELAC 3915
Count: BAG
Wt: 324.4 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 42.00022
Catalog: JELAC 3916
Count: BAG
Wt: 13.73 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Veneroida.
Taxon: Mercenaria mercenaria. (Northern Quahog)

Lot: 42.00023
Catalog: JELAC 3917
Count: BAG
Wt: 16.51 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 42.00024
Catalog: JELAC 3918
Count: 1 EA
Wt: 0.59 G
Object: Flake.
Material: Chert.
Typology: Flake.

Lot: 42.00025
Catalog: JELAC 3919
Count: 1 EA
Wt: 9.75 G
Object: Core.
Material: Chert.
Typology: Flake.

Lot: 42.00026
Catalog: JELAC 3920
Count: 9 EA
Wt: 40.19 G
Object: Stone, building.
Material: Slate.

Lot: 42.00027
Catalog: JELAC 3921
Count: BAG
Wt: 96.34 G
Object: Mortar.
Material: Mortar.

Lot: 42.00028
Catalog: JELAC 3922
Count: BAG
Wt: 37.55 G
Object: Brick.
Material: Clay.

Lot: 42.00029
Catalog: JELAC 3923
Count: BAG
Wt: 100.6 G
Object: Slag.
Material: Slag.

Lot: 42.00030
Catalog: JELAC 3924
Count: BAG
Wt: 2168. G
Object: Brick.
Material: Clay.

Lot: 42.00031
Catalog: JELAC 3925
Count: BAG
Wt: 214.1 G
Object: Wood fragment.
Material: Wood.

Lot: 43.00001
Catalog: JELAC 3926
Count: 1 EA
Wt: 4.66 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 43.00002
Catalog: JELAC 3927
Count: BAG
Wt: 67.13 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 43.00003
Catalog: JELAC 3928
Count: BAG
Wt: 8.03 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
HCO: Veneroida.
Taxon: Mercenaria mercenaria. (Northern Quahog)

Lot: 43.00004
Catalog: JELAC 3929
Count: BAG
Wt: 8.45 G
Object: Cinder.
Material: Coal.

Lot: 43.00005
Catalog: JELAC 3930
Count: BAG
Wt: 0.95 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 43.00006
Catalog: JELAC 3931
Count: 2 EA
Wt: 0.89 G
Object: Stone, building.
Material: Slate.

Lot: 43.00007
Catalog: JELAC 3932
Count: BAG
Wt: 66.94 G
Object: Brick.
Material: Clay.

Lot: 44.00001
Catalog: JELAC 3933
Count: 1 EA
Wt: 9.37 G
Object: Stone, manuport.
Material: Chert.

Lot: 45.00001
Catalog: JELAC 3934
Count: 1 EA
Wt: 1.51 G
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 45.00002
Catalog: JELAC 3935
Count: 1 EA
Wt: 4.20 G
Object: Staple, fence.
Material: Iron.

Lot: 45.00003
Catalog: JELAC 3936
Count: BAG
Wt: 16.18 G
Object: Metal fragment.
Material: Iron.

Lot: 45.00004
Catalog: JELAC 3937
Count: 4 EA
Wt: 13.86 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 45.00005
Catalog: JELAC 3938
Count: 2 EA
Wt: 2.43 G
Object: Nail.
Material: Iron.

Lot: 45.00006
Catalog: JELAC 3939
Count: 1 EA
Wt: 6.10 G
Object: Stone, building.
Material: Slate.

Lot: 45.00007
Catalog: JELAC 3940
Count: 1 EA
Wt: 9.48 G
Object: Food, bone.
Material: Fauna Remains.
Material: Bone.
HCO: Mammalia.

Lot: 45.00008
Catalog: JELAC 3941
Count: BAG
Wt: 40.06 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
HCO: Bivalvia.

Lot: 45.00009
Catalog: JELAC 3942
Count: BAG
Wt: 108.4 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 45.00010
Catalog: JELAC 3943
Count: BAG
Wt: 174.5 G
Object: Concrete fragment.
Material: Cement.

Lot: 45.00011
Catalog: JELAC 3944
Count: BAG
Wt: 119.6 G
Object: Brick.
Material: Clay.

Lot: 46.00001
Catalog: JELAC 3945
Count: 1 EA
Wt: 0.89 G
Object: Vessel fragment.
Material: Clay.
Type: Salt Glazed Stoneware.
Typology: Stoneware, Coarse.

Lot: 46.00002
Catalog: JELAC 3946
Count: 1 EA
Wt: 13.45 G
Object: Tap.
Material: Ferrous Metal.

Lot: 46.00003
Catalog: JELAC 3947
Count: BAG
Wt: 5.77 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Bivalvia.

Lot: 46.00004
Catalog: JELAC 3948
Count: BAG
Wt: 41.76 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
HCO: Ostreidae.
Taxon: Crassostrea virginica. (Eastern Oyster).

Lot: 46.00005
Catalog: JELAC 3949
Count: BAG
Wt: 0.75 G
Object: Brick.
Material: Clay.

Lot: 46.00006
Catalog: JELAC 3950
Count: BAG
Wt: 73.02 G
Object: Concrete fragment.
Material: Cement.

Lot: 47.00001
Catalog: JELAC 3951
Count: 1 EA
Wt: 4.93 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 47.00002
Catalog: JELAC 3952
Count: 1 EA
Wt: 3.32 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 47.00003
Catalog: JELAC 3953
Count: 1 EA
Wt: 0.33 G
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 47.00004
Catalog: JELAC 3954
Count: 1 EA
Wt: 0.15 G
Object: Glass fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 47.00005
Catalog: JELAC 3955
Count: 1 EA
Wt: 5.88 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 47.00006
Catalog: JELAC 3956
Count: 2 EA
Wt: 4.08 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 47.00007
Catalog: JELAC 3957
Count: BAG
Wt: 21.63 G
Object: Concretion.
Material: Ferrous Metal.

Lot: 47.00008
Catalog: JELAC 3958
Count: BAG
Wt: 18.75 G
Object: Cinder.
Material: Coal.

Lot: 47.00009
Catalog: JELAC 3959
Count: BAG
Wt: 22.97 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Bivalvia.

Lot: 47.00010
Catalog: JELAC 3960
Count: BAG
Wt: 215.7 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 47.00011
Catalog: JELAC 3961
Count: 1 EA
Wt: 3.22 G
Object: Stone, building.
Material: Slate.

Lot: 47.00012
Catalog: JELAC 3962
Count: BAG
Wt: 783.3 G
Object: Brick.
Material: Clay.

Lot: 48.00001
Catalog: JELAC 3963
Count: 1 EA
Wt: 1.29 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 48.00002
Catalog: JELAC 3964
Count: 2 EA
Wt: 9.48 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 48.00003
Catalog: JELAC 3965
Count: 5 EA
Wt: 23.29 G
Object: Stone, building.
Material: Slate.

Lot: 48.00004
Catalog: JELAC 3966
Count: 1 EA
Wt: 6.34 G
Object: Flake.
Material: Chert.
Typology: Flake.

Lot: 48.00005
Catalog: JELAC 3967
Count: BAG
Wt: 2.94 G
Object: Brick.
Material: Clay.

Lot: 49.00001
Catalog: JELAC 3968
Count: 1 EA
Wt: 42.02 G
Object: Vessel fragment.
Material: Clay.
Type: Salt Glazed Stoneware.
Typology: Stoneware, Coarse.

Lot: 49.00002
Catalog: JELAC 3969
Count: BAG
Wt: 4.17 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
HCO: Bivalvia.

Lot: 49.00003
Catalog: JELAC 3970
Count: BAG
Wt: 1.68 G
Object: Slag.
Material: Slag.

Lot: 49.00004
Catalog: JELAC 3971
Count: BAG
Wt: 60.48 G
Object: Brick.
Material: Clay.

Lot: 50.00001
Catalog: JELAC 3972
Count: BAG
Wt: 0.64 G
Object: Brick.
Material: Clay.

Lot: 50.00002
Catalog: JELAC 3973
Count: 1 EA
Wt: 2.12 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 51.00001
Catalog: JELAC 3974
Count: BAG
Wt: 1.24 G
Object: Brick.
Material: Clay.

Lot: 51.00002
Catalog: JELAC 3975
Count: 1 EA
Wt: 0.81 G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 52.00001
Catalog: JELAC 3976
Count: 1 EA
Wt: 0.12 G
Object: Bead.
Material: Plastic.
Typology: Bead, Modified.

Lot: 53.00001
Catalog: JELAC 3977
Count: 1 EA
Wt: 4.40 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 54.00001
Catalog: JELAC 3978
Count: 1 EA
Wt: 49.50 G
Object: Wire, barbed.
Material: Steel.

Lot: 55.00001
Catalog: JELAC 3979
Count: BAG
Wt: 55.48 G
Object: Brick.
Material: Clay.

Lot: 55.00002
Catalog: JELAC 3980
Count: BAG
Wt: 19.11 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Gastropoda.

Lot: 55.00003
Catalog: JELAC 3981
Count: BAG
Wt: 36.68 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 55.00004
Catalog: JELAC 3982
Count: 3 EA
Wt: 15.82 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 55.00005
Catalog: JELAC 3983
Count: 1 EA
Wt: 3.37 G
Object: Stone, building.
Material: Slate.

Lot: 55.00006
Catalog: JELAC 3984
Count: 1 EA
Wt: 0.81 G
Object: Ring.
Material: Copper.

Lot: 56.00001
Catalog: JELAC 3985
Count: BAG
Wt: 15.42 G
Object: Brick.
Material: Clay.

Lot: 56.00002
Catalog: JELAC 3986
Count: BAG
Wt: 30.41 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Bivalvia.

Lot: 56.00003
Catalog: JELAC 3987
Count: BAG
Wt: 10.86 G
Object: Food, shell. Material: Shell.
Material: Fauna Remains.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 57.00001
Catalog: JELAC 3988
Count: BAG
Wt: 3.97 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Bivalvia.

Lot: 57.00002 Catalog: JELAC 3989
Count: BAG
Wt: 8.40 G
Object: Food, shell.
Material: Fauna Remains.
Material: Shell.
Taxon: Crassostrea virginica. (Eastern Oyster).
HCO: Ostreidae.

Lot: 57.00003
Catalog: JELAC 3990
Count: BAG
Wt: 10.61 G
Object: Brick.
Material: Clay.

Lot: 58.00001
Catalog: JELAC 3991
Count: 1 EA
Wt: 16.08 G
Object: Rod.
Material: Iron.

Lot: 59.00001
Catalog: JELAC 3992
Count: 2 EA
Wt: 2.87 G
Object: Shell, shotgun.
Material: Plastic.
Typology: Shotgun.

Lot: 60.00001
Catalog: JELAC 3993
Count: BAG
Wt: 22.18 G
Object: Brick.
Material: Clay.

Lot: 61.00001
Catalog: JELAC 3994
Count: BAG
Wt: 1.30 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Bivalvia.

Lot: 61.00002
Catalog: JELAC 3995
Count: BAG
Wt: 1.93 G
Object: Cinder.
Material: Coal.

Lot: 62.00001
Catalog: JELAC 3996
Count: BAG
Wt: 1.00 G
Object: Slag.
Material: Slag.

Lot: 63.00001
Catalog: JELAC 3997
Count: BAG
Wt: 2.14 G
Object: Mortar.
Material: Mortar.

Lot: 64.00001
Catalog: JELAC 3998
Count: BAG
Wt: 0.47 G
Object: Charcoal.
Material: Flora Remains.
HCO: Plantae.
Typology: Sample.

Lot: 64.00002
Catalog: JELAC 3999
Count: BAG
Wt: 5.33 G
Object: Food, shell.
Material: Shell.
Material: Fauna Remains.
HCO: Bivalvia.

Lot: 64.00003
Catalog: JELAC 4000
Count: 1 EA
Wt: 9.08 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 65.00001
Catalog: JELAC 4001
Count: BAG
Wt: 2.78 G
Object: Brick.
Material: Clay.

Lot: 66.00001
Catalog: JELAC 4002
Count: BAG
Wt: 4.02 G
Object: Brick.
Material: Clay.

Lot: 67.00001
Catalog: JELAC 4003
Count: BAG
Wt: 37.83 G
Object: Brick.
Material: Clay.

Lot: 68.00001
Catalog: JELAC 4004
Count: BAG
Wt: 31.75 G
Object: Cinder.
Material: Coal.

Lot: 68.00002
Catalog: JELAC 4005
Count: BAG
Wt: 1.77 G
Object: Brick.
Material: Clay.

Lot: 69.00001
Catalog: JELAC 4006
Count: 1 EA
Wt: 29.21 G
Object: Bottle.
Material: Glass.
Typology: Container Glass.

Lot: 70.00001
Catalog: JELAC 4007
Count: BAG
Wt: 19.47 G
Object: Slag.
Material: Slag.

Lot: 71.00001
Catalog: JELAC 4008
Count: 1 EA
Wt: 5.68 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Quarter Dollar.

Lot: 72.00001
Catalog: JELAC 4009
Count: 1 EA
Wt: 2.50 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 73.00001
Catalog: JELAC 4010
Count: 1 EA
Wt: 2.18 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 74.00001
Catalog: JELAC 4011
Count: 1 EA
Wt: 22.77 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 75.00001
Catalog: JELAC 4012
Count: 2 EA
Wt: 27.45 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 76.00001
Catalog: JELAC 4013
Count: 1 EA
Wt: 2.18 G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 77.00001
Catalog: JELAC 4014
Count: 1 EA
Wt: 8.92 G
Object: Bullet.
Material: Lead.
Typology: Jacketed and Flat Nose. (Wadcutter).

Lot: 78.00001
Catalog: JELAC 4015
Count: 1 EA
Wt: 18.38 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 79.00001
Catalog: JELAC 4016
Count: 1 EA
Wt: 2.53 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 80.00001
Catalog: JELAC 4017
Count: 1 EA
Wt: 20.87 G
Object: Bar.
Material: Lead.

Lot: 81.00001
Catalog: JELAC 4018
Count: 1 EA
Wt: 5.09 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 82.00001
Catalog: JELAC 4019
Count: 1 EA
Wt: 3.12 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 83.00001
Catalog: JELAC 4020
Count: 1 EA
Wt: 1.76 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 84.00001
Catalog: JELAC 4021
Count: 1 EA
Wt: 4.64 G
Object: Watch, pocket.
Material: Copper.
Material: Iron.

Lot: 85.00001
Catalog: JELAC 4022
Count: 5 EA
Wt: 15.02 G
Object: Harmonica.
Material: Brass.

Lot: 86.00001
Catalog: JELAC 4023
Count: 1 EA
Wt: 2730. G
Object: Ax.
Material: Iron.

Lot: 87.00001
Catalog: JELAC 4024
Count: 1 EA
Wt: 25.19 G
Object: Thimble.
Material: Copper Alloy.

Lot: 88.00001
Catalog: JELAC 4025
Count: 1 EA
Wt: 22.08 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 89.00001
Catalog: JELAC 4026
Count: 1 EA
Wt: 4.88 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 89.00002
Catalog: JELAC 4027
Count: 1 EA
Wt: 4.74 G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 89.00003
Catalog: JELAC 4028
Count: 1 EA
Wt: 3.06 G
Object: Coin.
Material: Copper.
Material: Tin.
Material: Zinc.
Typology: Penny.

Lot: 90.00001
Catalog: JELAC 4029
Count: 1 EA
Wt: 4.64 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 91.00001
Catalog: JELAC 4030
Count: 1 EA
Wt: 0.82 G
Object: Token, tax.
Material: Aluminum.

Lot: 92.00001
Catalog: JELAC 4031
Count: 1 EA
Wt: 113.1 G
Object: Weight, balance.
Material: Iron.
Material: Lead.

Lot: 93.00001
Catalog: JELAC 4032
Count: 1 EA
Wt: 2.90 G
Object: Coin.
Material: Zinc.
Material: Tin.
Material: Copper.
Typology: Penny.

Lot: 94.00001
Catalog: JELAC 4033
Count: 1 EA
Wt: 17.78 G
Object: Rosette.
Material: Iron.
Material: Lead.
Material: Brass.

Lot: 95.00001
Catalog: JELAC 4034
Count: 1 EA
Wt: 24.69 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 96.00001
Catalog: JELAC 4035
Count: 1 EA
Wt: 42.66 G
Object: Spike.
Material: Iron.

Lot: 97.00001
Catalog: JELAC 4036
Count: BAG
Wt: 4.61 G
Object: Metal fragment.
Material: Lead.

Lot: 98.00001
Catalog: JELAC 4037
Count: 1 EA
Wt: 4.62 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 99.00001
Catalog: JELAC 4038
Count: 1 EA
Wt: 10.61 G
Object: Strap.
Material: Copper.

Lot: 100.00001
Catalog: JELAC 4039
Count: BAG
Wt: 155.7 G
Object: Metal fragment.
Material: Lead.

Lot: 101.00001
Catalog: JELAC 4040
Count: 1 EA
Wt: 5.32 G
Object: Vessel fragment.
Material: Clay.
Type: Ironstone.
Typology: Earthenware, Refined, Ironstone.

Lot: 101.00002
Catalog: JELAC 4041
Count: 1 EA
Wt: 155.1 G
Object: Fixture, light. Material: Iron.

Lot: 102.00001
Catalog: JELAC 4042
Count: 1 EA
Wt: 71.70 G
Object: Shot, case.
Material: Iron.

Lot: 103.00001
Catalog: JELAC 4043
Count: BAG
Wt: 81.71 G
Object: Metal fragment.
Material: Lead.

Lot: 104.00001
Catalog: JELAC 4044
Count: 1 EA
Wt: 21.44 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 105.00001
Catalog: JELAC 4045
Count: 1 EA
Wt: 5.22 G
Object: Case, cartridge.
Material: Brass.
Typology: Pinfire.

Lot: 106.00001
Catalog: JELAC 4046
Count: 1 EA
Wt: 11.23 G
Object: Case, cartridge.
Material: Brass.
Typology: Pinfire.

Lot: 107.00001
Catalog: JELAC 4047
Count: 1 EA
Wt: 17.95 G
Object: Spike.
Material: Iron.

Lot: 108.00001
Catalog: JELAC 4048
Count: 1 EA
Wt: 40.96 G
Object: Bullet, minie.
Material: Lead.
Typology: Non-Jacketed and Round Nose Minie Ball.

Lot: 109.00001
Catalog: JELAC 4049
Count: BAG
Wt: 338.1 G
Object: Metal fragment.
Material: Iron.

Lot: 110.00001
Catalog: JELAC 4178
Count: 1 EA
Wt: 1.56 G
Object: Rivet.
Material: Brass.

Lot: 111.00001
Catalog: JELAC 4179
Count: BAG
Wt: 133.8 G
Object: Metal fragment.
Material: Lead.

Lot: 112.00001
Catalog: JELAC 4180
Count: 2 EA
Wt: 19.90 G
Object: Knife, pocket.
Material: Brass.
Material: Iron.

Lot: 113.00001
Catalog: JELAC 4181
Count: 1 EA
Wt: 1423. G
Object: Cannonball.
Material: Iron.

Lot: 114.00001
Catalog: JELAC 4182
Count: BAG
Wt: 23.39 G
Object: Metal fragment.
Material: Lead.

Lot: 115.00001
Catalog: JELAC 4183
Count: 1 EA
Wt: 3.37 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 116.00001
Catalog: JELAC 4184
Count: BAG
Wt: 8.87 G
Object: Metal fragment.
Material: Lead.

Lot: 117.00001
Catalog: JELAC 4185
Count: 1 EA
Wt: 2.20 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 118.00001
Catalog: JELAC 4186
Count: 1 EA
Wt: 3.76 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 119.00001
Catalog: JELAC 4187
Count: 1 EA
Wt: 1.91 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 120.00001
Catalog: JELAC 4188
Count: 1 EA
Wt: 12.78 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 121.00001
Catalog: JELAC 4189
Count: 1 EA
Wt: 1.84 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 122.00001
Catalog: JELAC 4190
Count: 1 EA
Wt: 2.08 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 123.00001
Catalog: JELAC 4191
Count: 2 EA
Wt: 39.86 G
Object: Buckle.
Material: Iron.

Lot: 124.00001
Catalog: JELAC 4192
Count: 1 EA
Wt: 8.96 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 125.00001
Catalog: JELAC 4193
Count: 1 EA
Wt: 4.58 G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 126.00001
Catalog: JELAC 4194
Count: 1 EA
Wt: 4.99 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 127.00001
Catalog: JELAC 4195
Count: 1 EA
Wt: 2.85 G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 128.00001
Catalog: JELAC 4196
Count: 1 EA
Wt: 2.89 G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 129.00001
Catalog: JELAC 4197
Count: 1 EA
Wt: 3.80 G
Object: Case, cartridge.
Material: Brass.
Typology: Centerfire.

Lot: 130.00001
Catalog: JELAC 4198
Count: 1 EA
Wt: 4.82 G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 130.00002
Catalog: JELAC 4199
Count: 1 EA
Wt: 5.37 G
Object: Vessel fragment.
Material: Clay.
Type: Olive Jar.
Typology: Earthenware, Coarse.

Lot: 131.00001
Catalog: JELAC 4200
Count: 1 EA
Wt: 10.46 G
Object: Lock.
Material: Stainless Steel.
Material: Iron.
Typology: Lock.

Lot: 132.00001
Catalog: JELAC 4201
Count: 1 EA
Wt: 4.03 G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 133.00001
Catalog: JELAC 4202
Count: 1 EA
Wt: 10.05 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 134.00001
Catalog: JELAC 4203
Count: 1 EA
Wt: 4.45 G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 135.00001
Catalog: JELAC 4204
Count: 1 EA
Wt: 1.27 G
Object: Coin.
Material: Silver.
Material: Copper.
Typology: Half Dime.

Lot: 136.00001
Catalog: JELAC 4205
Count: 1 EA
Wt: 9.93 G
Object: Buckle.
Material: Iron.

Lot: 137.00001
Catalog: JELAC 4206
Count: BAG
Wt: 30.83 G
Object: Metal fragment.
Material: Lead.

Lot: 138.00001
Catalog: JELAC 4207
Count: 1 EA
Wt: 4.30 G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 139.00001
Catalog: JELAC 4208
Count: 1 EA
Wt: 10.25 G
Object: Hinge.
Material: Iron.
Material: Brass.
Typology: Hinge, Butterfly.

Lot: 140.00001
Catalog: JELAC 4209
Count: 1 EA
Wt: 4.86 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 140.00002
Catalog: JELAC 4210
Count: 2 EA
Wt: 5.70 G
Object: Coin.
Material: Zinc.
Material: Tin.
Material: Copper.
Typology: Penny.

Lot: 140.00003
Catalog: JELAC 4211
Count: 1 EA
Wt: 2.91 G
Object: Coin.
Material: Tin.
Material: Zinc.
Material: Copper.
Typology: Penny.

Lot: 140.00004
Catalog: JELAC 4212
Count: 1 EA
Wt: 2.75 G
Object: Coin.
Material: Copper.
Material: Tin.
Material: Zinc.
Typology: Penny.

Lot: 141.00001
Catalog: JELAC 4213
Count: 1 EA
Wt: 2.81 G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 141.00002
Catalog: JELAC 4214
Count: 1 EA
Wt: 2.77 G
Object: Coin.
Material: Zinc.
Material: Tin.
Material: Copper.
Typology: Penny.

Lot: 141.00003
Catalog: JELAC 4215
Count: 1 EA
Wt: 2.87 G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 141.00004
Catalog: JELAC 4216
Count: 1 EA
Wt: 2.75 G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 142.00001
Catalog: JELAC 4217
Count: 1 EA
Wt: 9.00 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 143.00001
Catalog: JELAC 4218
Count: 1 EA
Wt: 3.19 G
Object: Rivet.
Material: Copper.

Lot: 144.00001
Catalog: JELAC 4219
Count: 1 EA
Wt: 12.56 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 145.00001
Catalog: JELAC 4220
Count: 10 EA
Wt: 5.98 G
Object: Cap, bottle.
Material: Copper.

Lot: 146.00001
Catalog: JELAC 4221
Count: 1 EA
Wt: 3.33 G
Object: Button.
Material: Brass.
Typology: Button, Two Component.

Lot: 147.00001
Catalog: JELAC 4222
Count: 1 EA
Wt: 2.58 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 148.00001
Catalog: JELAC 4223
Count: 1 EA
Wt: 3.00 G
Object: Coin.
Material: Tin.
Material: Zinc.
Material: Copper.
Typology: Penny.

Lot: 149.00001
Catalog: JELAC 4224
Count: 1 EA
Wt: 15.15 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Semi-Pointed

Lot: 150.00001
Catalog: JELAC 4225
Count: 1 EA
Wt: 23.70 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 151.00001
Catalog: JELAC 4226
Count: 1 EA
Wt: 60.00 G
Object: Sinker.
Material: Lead.
Material: Iron.

Lot: 152.00001
Catalog: JELAC 4227
Count: 2 EA
Wt: 5.50 G
Object: Coin.
Material: Zinc.
Material: Copper.
Material: Tin.
Typology: Penny.

Lot: 152.00002
Catalog: JELAC 4228
Count: 1 EA
Wt: 2.77 G
Object: Coin.
Material: Zinc.
Material: Tin.
Material: Copper.
Typology: Penny.

Lot: 152.00003
Catalog: JELAC 4229
Count: 1 EA
Wt: 2.85 G
Object: Coin.
Material: Copper.
Material: Tin.
Material: Zinc.
Typology: Penny.

Lot: 153.00001
Catalog: JELAC 4230
Count: BAG
Wt: 18.17 G
Object: Metal fragment.
Material: Lead.

Lot: 154.00001
Catalog: JELAC 4231
Count: 1 EA
Wt: 4.63 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 155.00001
Catalog: JELAC 4232
Count: 1 EA
Wt: 2.99 G
Object: Vessel fragment.
Material: Clay.
Type: Whiteware.
Typology: Earthenware, Refined, Whiteware.

Lot: 155.00002
Catalog: JELAC 4233
Count: 1 EA
Wt: 77.25 G
Object: Buckle, harness.
Material: Iron.

Lot: 156.00001
Catalog: JELAC 4234
Count: 1 EA
Wt: 19.88 G
Object: Vessel fragment.
Material: Clay.
Type: Ironstone.
Typology: Earthenware, Refined, Ironstone.

Lot: 157.00001
Catalog: JELAC 4235
Count: 1 EA
Wt: 8.81 G
Object: Vessel fragment.
Material: Clay.
Type: Porcelain.
Typology: Porcelain.

Lot: 157.00002
Catalog: JELAC 4236
Count: 1 EA
Wt: 25.05 G
Object: Vessel fragment.
Material: Clay.
Type: Yellow Ware.
Typology: Earthenware, Refined, Yellow Ware.

Lot: 158.00001
Catalog: JELAC 4237
Count: 2 EA
Wt: 68.63 G
Object: Bolt.
Material: Iron.
Typology: Bolt.

Lot: 158.00002
Catalog: JELAC 4238
Count: 4 EA
Wt: 134.5 G
Object: Handle.
Material: Iron.
Typology: Handle.

Lot: 158.00003
Catalog: JELAC 4239
Count: 1 EA
Wt: 38.06 G
Object: Bar.
Material: Iron.

Lot: 159.00001
Catalog: JELAC 4240
Count: 1 EA
Wt: 19.49 G
Object: Disk.
Material: Lead.

Lot: 160.00001
Catalog: JELAC 4241
Count: 1 EA
Wt: 4.62 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 160.00002
Catalog: JELAC 4242
Count: 1 EA
Wt: 4.63 G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 160.00003
Catalog: JELAC 4243
Count: 1 EA
Wt: 2.90 G
Object: Coin.
Material: Tin.
Material: Zinc.
Material: Copper.
Typology: Penny.

Lot: 160.00004
Catalog: JELAC 4244
Count: 1 EA
Wt: 2.87 G
Object: Coin.
Material: Tin.
Material: Zinc.
Material: Copper.
Typology: Penny.

Lot: 160.00005
Catalog: JELAC 4245
Count: 1 EA
Wt: 2.80 G
Object: Coin.
Material: Zinc.
Material: Copper.
Material: Tin.
Typology: Penny.

Lot: 160.00006
Catalog: JELAC 4246
Count: 1 EA
Wt: 2.73 G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 161.00001
Catalog: JELAC 4247
Count: 1 EA
Wt: 588.6 G
Object: Shell, artillery.
Material: Iron.

Lot: 162.00001
Catalog: JELAC 4248
Count: 1 EA
Wt: 40.59 G
Object: Pintle.
Material: Iron.

Lot: 163.00001
Catalog: JELAC 4249
Count: 1 EA
Wt: 51.13 G
Object: Spike.
Material: Iron.

Lot: 164.00001
Catalog: JELAC 4250
Count: 1 EA
Wt: 2.64 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 165.00001
Catalog: JELAC 4251
Count: 1 EA
Wt: 4.48 G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 165.00002
Catalog: JELAC 4252
Count: 1 EA
Wt: 2.89 G
Object: Coin.
Material: Copper.
Material: Tin.
Material: Zinc.
Typology: Penny.

Lot: 166.00001
Catalog: JELAC 4253
Count: 1 EA
Wt: 7.35 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 167.00001
Catalog: JELAC 4254
Count: 1 EA
Wt: 1.77 G
Object: Button, military.
Material: Brass.
Typology: Button, Three Component.

Lot: 168.00001
Catalog: JELAC 4255
Count: 1 EA
Wt: 3.01 G
Object: Coin.
Material: Zinc.
Material: Tin.
Material: Copper.
Typology: Penny.

Lot: 168.00002
Catalog: JELAC 4256
Count: 1 EA
Wt: 2.98 G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 169.00001
Catalog: JELAC 4257
Count: 1 EA
Wt: 2.05 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 170.00001
Catalog: JELAC 4258
Count: BAG
Wt: 2.55 G
Object: Metal fragment.
Material: Ferrous Metal.

Lot: 171.00001
Catalog: JELAC 4259
Count: BAG
Wt: 163.0 G
Object: Metal fragment.
Material: Lead.

Lot: 172.00001
Catalog: JELAC 4260
Count: BAG
Wt: 26.62 G
Object: Metal fragment.
Material: Lead.

Lot: 173.00001
Catalog: JELAC 4261
Count: BAG
Wt: 1386. G
Object: Metal fragment.
Material: Lead.

Lot: 174.00001
Catalog: JELAC 4262
Count: BAG
Wt: 1634. G
Object: Metal fragment.
Material: Lead.

Lot: 175.00001
Catalog: JELAC 4263
Count: 1 EA
Wt: 2.95 G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 176.00001
Catalog: JELAC 4264
Count: 1 EA
Wt: 1312. G
Object: Cannonball.
Material: Iron.

Lot: 177.00001
Catalog: JELAC 4265
Count: 1 EA
Wt: 42.37 G
Object: Screw.
Material: Copper Alloy.
Typology: Screw.

Lot: 178.00001
Catalog: JELAC 4266
Count: 1 EA
Wt: 26.14 G
Object: Spike.
Material: Iron.

Lot: 179.00001
Catalog: JELAC 4267
Count: BAG
Wt: 8.83 G
Object: Metal fragment.
Material: Lead.

Lot: 180.00001
Catalog: JELAC 4268
Count: BAG
Wt: 53.16 G
Object: Metal fragment.
Material: Lead.

Lot: 181.00001
Catalog: JELAC 4269
Count: 1 EA
Wt: 29.20 G
Object: Bottle.
Material: Glass.
Typology: Container Glass.
Typology: Finish, One Part.

Lot: 181.00002
Catalog: JELAC 4270
Count: BAG
Wt: 34.29 G
Object: Mortar.
Material: Mortar.

Lot: 181.00003
Catalog: JELAC 4271
Count: 1 EA
Wt: 3.03 G
Object: Vessel fragment.
Material: Clay.
Type: Porcelain.
Typology: Porcelain.

Lot: 181.00004
Catalog: JELAC 4272
Count: 1 EA
Wt: 29.66 G
Object: Vessel fragment.
Material: Clay.
Type: Salt Glazed Stoneware.
Typology: Stoneware, Coarse.

Lot: 182.00001
Catalog: JELAC 4273
Count: 1 EA
Wt: 338.4 G
Object: Shot, case.
Material: Iron.

Lot: 183.00001
Catalog: JELAC 4274
Count: 1 EA
Wt: 4.86 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Quarter Dollar.

Lot: 184.00001
Catalog: JELAC 4275
Count: 1 EA
Wt: 0.84 G
Object: Token, tax.
Material: Aluminum.

Lot: 185.00001
Catalog: JELAC 4276
Count: 1 EA
Wt: 4.37 G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 186.00001
Catalog: JELAC 4277
Count: BAG
Wt: 102.2 G
Object: Metal fragment.
Material: Lead.

Lot: 187.00001
Catalog: JELAC 4278
Count: 1 EA
Wt: 2.41 G
Object: Coin.
Material: Copper.
Material: Tin.
Material: Zinc.
Typology: Penny.

Lot: 188.00001
Catalog: JELAC 4279
Count: 1 EA
Wt: 52.32 G
Object: Cap.
Material: Iron.

Lot: 189.00001
Catalog: JELAC 4280
Count: 1 EA
Wt: 2.07 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 190.00001
Catalog: JELAC 4281
Count: BAG
Wt: 16.31 G
Object: Slag.
Material: Slag.

Lot: 191.00001
Catalog: JELAC 4282
Count: 1 EA
Wt: 231.8 G
Object: Yoke, animal.
Material: Copper Alloy.

Lot: 192.00001
Catalog: JELAC 4283
Count: 1 EA
Wt: 62.17 G
Object: Knife, butter.
Material: Stainless Steel.
Typology: Handle.

Lot: 193.00001
Catalog: JELAC 4284
Count: 1 EA
Wt: 8.97 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 194.00001
Catalog: JELAC 4285
Count: 1 EA
Wt: 37.57 G
Object: Handle.
Material: Brass.
Typology: Handle, Furniture, Knob Pull.

Lot: 195.00001
Catalog: JELAC 4286
Count: 1 EA
Wt: 11.24 G
Object: Utensil.
Material: Ferrous Metal.
Typology: Handle.

Lot: 196.00001
Catalog: JELAC 4287
Count: 1 EA
Wt: 31.50 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 197.00001
Catalog: JELAC 4288
Count: 3 EA
Wt: 18.25 G
Object: Canteen.
Material: Brass.

Lot: 198.00001
Catalog: JELAC 4289
Count: 3 EA
Wt: 76.35 G
Object: Handle.
Material: Iron.
Typology: Handle.

Lot: 199.00001
Catalog: JELAC 4290
Count: BAG
Wt: 5.64 G
Object: Metal fragment.
Material: Brass.

Lot: 200.00001
Catalog: JELAC 4291
Count: 1 EA
Wt: 1.29 G
Object: Vessel fragment.
Material: Clay.
Type: Porcelain.
Typology: Porcelain.

Lot: 201.00001
Catalog: JELAC 4292
Count: 1 EA
Wt: 14.05 G
Object: Grommet.
Material: Brass.

Lot: 202.00001
Catalog: JELAC 4293
Count: 1 EA
Wt: 2.28 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 203.00001
Catalog: JELAC 4294
Count: 1 EA
Wt: 17.57 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 204.00001
Catalog: JELAC 4295
Count: 1 EA
Wt: 1.72 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 205.00001
Catalog: JELAC 4296
Count: 1 EA
Wt: 1.85 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 206.00001
Catalog: JELAC 4297
Count: 1 EA
Wt: 2.09 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 207.00001
Catalog: JELAC 4298
Count: 1 EA
Wt: 2.89 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 208.00001
Catalog: JELAC 4299
Count: 1 EA
Wt: 1.89 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 209.00001
Catalog: JELAC 4300
Count: 1 EA
Wt: 26.22 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 210.00001
Catalog: JELAC 4301
Count: BAG
Wt: 10.42 G
Object: Metal fragment.
Material: Lead.

Lot: 211.00001
Catalog: JELAC 4302
Count: 1 EA
Wt: 3.03 G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 212.00001
Catalog: JELAC 4303
Count: 1 EA
Wt: 1.99 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 213.00001
Catalog: JELAC 4304
Count: 1 EA
Wt: 4.87 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Pointed (Spritzer).

Lot: 214.00001
Catalog: JELAC 4305
Count: 1 EA
Wt: 24.81 G
Object: Knife, pocket.
Material: Brass.
Material: Stainless Steel.

Lot: 215.00001
Catalog: JELAC 4306
Count: 1 EA
Wt: 2.77 G
Object: Coin.
Material: Tin.
Material: Zinc.
Material: Copper.
Typology: Penny.

Lot: 216.00001
Catalog: JELAC 4307
Count: 1 EA
Wt: 21.69 G
Object: Hardware.
Material: Brass.

Lot: 217.00001
Catalog: JELAC 4308
Count: 1 EA
Wt: 20.04 G
Object: Hardware.
Material: Copper Alloy.

Lot: 218.00001
Catalog: JELAC 4309
Count: 1 EA
Wt: 8.44 G
Object: Coin.
Material: Bronze.

Lot: 219.00001
Catalog: JELAC 4310
Count: 1 EA
Wt: 231.3 G
Object: Hinge.
Material: Iron.
Typology: Hinge, Strap.

Lot: 219.00002
Catalog: JELAC 4311
Count: 1 EA
Wt: 28.60 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 220.00001
Catalog: JELAC 4312
Count: BAG
Wt: 214.5 G
Object: Brick.
Material: Clay.

Lot: 220.00002
Catalog: JELAC 4313
Count: 2 EA
Wt: 10.81 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 220.00003
Catalog: JELAC 4314
Count: 1 EA
Wt: 18.81 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
Taxon: Bos taurus. (Cow).
HCO: Bovidae.

Lot: 220.00004
Catalog: JELAC 4315
Count: 1 EA
Wt: 33.57 G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 220.00005
Catalog: JELAC 4316
Count: 1 EA
Wt: 5.59 G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 220.00006
Catalog: JELAC 4317
Count: 1 EA
Wt: 1.22 G
Object: Button, military.
Material: Brass.
Typology: Button, Three Component.

Lot: 221.00001
Catalog: JELAC 4318
Count: 1 EA
Wt: 8.21 G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 221.00002
Catalog: JELAC 4319
Count: 1 EA
Wt: 0.69 G
Object: Tile.
Material: Marble.

Lot: 221.00003
Catalog: JELAC 4320
Count: 2 EA
Wt: 1645. G
Object: Stove, wood.
Material: Iron.

Lot: 222.00001
Catalog: JELAC 4321
Count: 1 EA
Wt: 6.08 G
Object: Shot.
Material: Lead.
Typology: Ball.

Lot: 223.00001
Catalog: JELAC 4322
Count: BAG
Wt: 25.17 G
Object: Metal fragment.
Material: Lead.

Lot: 224.00001
Catalog: JELAC 4323
Count: 1 EA
Wt: 18.05 G
Object: Hardware.
Material: Brass.

Lot: 225.00001
Catalog: JELAC 4324
Count: 1 EA
Wt: 2.88 G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 226.00001
Catalog: JELAC 4325
Count: BAG
Wt: 9.53 G
Object: Metal fragment.
Material: Ferrous Metal.

Lot: 227.00001
Catalog: JELAC 4326
Count: 1 EA
Wt: 2.20 G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 228.00001
Catalog: JELAC 4327
Count: 1 EA
Wt: 9.51 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 229.00001
Catalog: JELAC 4328
Count: 1 EA
Wt: 5.51 G
Object: Pintle.
Material: Iron.

Lot: 230.00001
Catalog: JELAC 4329
Count: 1 EA
Wt: 23.02 G
Object: Sword.
Material: Brass.

Lot: 231.00001
Catalog: JELAC 4330
Count: 1 EA
Wt: 5.57 G
Object: Rivet.
Material: Brass.

Lot: 232.00001
Catalog: JELAC 4331
Count: 1 EA
Wt: 2.72 G
Object: Coin.
Material: Zinc.
Material: Tin.
Material: Copper.
Typology: Penny.

Lot: 233.00001
Catalog: JELAC 4332
Count: 1 EA
Wt: 150.9 G
Object: Hardware.
Material: Copper Alloy.

Lot: 233.00002
Catalog: JELAC 4333
Count: 1 EA
Wt: 2.34 G
Object: Nonfood, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Rodentia.

Lot: 234.00001
Catalog: JELAC 4334
Count: 1 EA
Wt: 0.89 G
Object: Token, tax.
Material: Aluminum.

Lot: 235.00001
Catalog: JELAC 4335
Count: BAG
Wt: 11.06 G
Object: Metal fragment.
Material: Brass.

Lot: 236.00001
Catalog: JELAC 4336
Count: 1 EA
Wt: 30.96 G
Object: Bullet, minie.
Material: Lead.
Typology: Non-Jacketed and Round Nose Minie Ball.

Lot: 237.00001
Catalog: JELAC 4337
Count: 1 EA
Wt: 14.08 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 238.00001
Catalog: JELAC 4338
Count: 1 EA
Wt: 2.59 G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 239.00001
Catalog: JELAC 4339
Count: 1 EA
Wt: 2.71 G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 240.00001
Catalog: JELAC 4340
Count: BAG
Wt: 18.98 G
Object: Metal fragment.
Material: Lead.

Lot: 241.00001
Catalog: JELAC 4341
Count: 1 EA
Wt: 8.22 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 242.00001
Catalog: JELAC 4342
Count: BAG
Wt: 10.25 G
Object: Metal fragment.
Material: Brass.

Lot: 243.00001
Catalog: JELAC 4343
Count: 1 EA
Wt: 53.75 G
Object: Buckle.
Material: Brass.

Lot: 244.00001
Catalog: JELAC 4344
Count: 1 EA
Wt: 7.68 G
Object: Badge.
Material: Copper Alloy.

Lot: 245.00001
Catalog: JELAC 4345
Count: 1 EA
Wt: 372.9 G
Object: Ax.
Material: Iron.

Lot: 246.00001
Catalog: JELAC 4346
Count: 1 EA
Wt: 27.36 G
Object: Rod.
Material: Iron.

Lot: 247.00001
Catalog: JELAC 4347
Count: BAG
Wt: 6.09 G
Object: Metal fragment.
Material: Lead.

Lot: 248.00001
Catalog: JELAC 4348
Count: 1 EA
Wt: 1.78 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 249.00001
Catalog: JELAC 4349
Count: 1 EA
Wt: 2.25 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 250.00001
Catalog: JELAC 4350
Count: 1 EA
Wt: 2740. G
Object: Horseshoe.
Material: Iron.

Lot: 251.00001
Catalog: JELAC 4351
Count: 1 EA
Wt: 1.98 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 252.00001
Catalog: JELAC 4352
Count: 1 EA
Wt: 56.32 G
Object: Spike.
Material: Iron.

Lot: 253.00001
Catalog: JELAC 4353
Count: 1 EA
Wt: 40.97 G
Object: Strap.
Material: Brass.

Lot: 254.00001
Catalog: JELAC 4354
Count: 8 EA
Wt: 180.4 G
Object: Vessel fragment.
Material: Clay.
Type: Untyped.
Typology: Stoneware, Refined.

Lot: 254.00002
Catalog: JELAC 4355
Count: BAG
Wt: 4.44 G
Object: Metal fragment.
Material: Iron.

Lot: 254.00003
Catalog: JELAC 4356
Count: 1 EA
Wt: 458.8 G
Object: Strap.
Material: Iron.

Lot: 255.00001
Catalog: JELAC 4357
Count: 1 EA
Wt: 2.80 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 256.00001
Catalog: JELAC 4358
Count: 1 EA
Wt: 33.85 G
Object: Strap.
Material: Lead.

Lot: 257.00001
Catalog: JELAC 4359
Count: 1 EA
Wt: 141.7 G
Object: Bolt, eye.
Material: Brass.

Lot: 258.00001
Catalog: JELAC 4360
Count: 1 EA
Wt: 2.26 G
Object: Coin.
Material: Zinc.
Material: Copper.
Material: Tin.
Typology: Penny.

Lot: 259.00001
Catalog: JELAC 4361
Count: 1 EA
Wt: 2.43 G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 260.00001
Catalog: JELAC 4362
Count: 1 EA
Wt: 30.78 G
Object: Case, watch.
Material: Copper Alloy.

Lot: 261.00001
Catalog: JELAC 4363
Count: 1 EA
Wt: 3.24 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 262.00001
Catalog: JELAC 4364
Count: 1 EA
Wt: 53.99 G
Object: Spike.
Material: Iron.

Lot: 263.00001
Catalog: JELAC 4365
Count: BAG
Wt: 0.35 G
Object: Cinder.
Material: Coal.

Lot: 263.00002
Catalog: JELAC 4366
Count: 1 EA
Wt: 0.96 G
Object: Windowpane.
Material: Glass.
Typology: Flat Glass.

Lot: 263.00003
Catalog: JELAC 4367
Count: 1 EA
Wt: 2.18 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 263.00004
Catalog: JELAC 4368
Count: 1 EA
Wt: 0.48 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 263.00005
Catalog: JELAC 4369
Count: 2 EA
Wt: 4.11 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 263.00006
Catalog: JELAC 4370
Count: 1 EA
Wt: 0.25 G
Object: Glass fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 263.00007
Catalog: JELAC 4371
Count: 2 EA
Wt: 1.69 G
Object: Stone, building.
Material: Slate.

Lot: 263.00008
Catalog: JELAC 4372
Count: 1 EA
Wt: 0.51 G
Object: Vessel fragment.
Material: Clay.
Type: Porcelain.
Typology: Porcelain.

Lot: 263.00009
Catalog: JELAC 4373
Count: 1 EA
Wt: 1.55 G
Object: Vessel fragment.
Material: Clay.
Type: Untyped.
Typology: Semivitreous.

Lot: 263.00010
Catalog: JELAC 4374
Count: 1 EA
Wt: 0.15 G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 263.00011
Catalog: JELAC 4375
Count: BAG
Wt: 32.73 G
Object: Brick.
Material: Clay.

Lot: 264.00001
Catalog: JELAC 4376
Count: 1 EA
Wt: 6.95 G
Object: Stone, building.
Material: Slate.

Lot: 264.00002
Catalog: JELAC 4377
Count: BAG
Wt: 4.08 G
Object: Cinder.
Material: Coal.

Lot: 264.00003
Catalog: JELAC 4378
Count: 2 EA
Wt: 0.42 G
Object: Food, bone.
Material: Bone.
Material: Fauna Remains.
HCO: Vertebrata.

Lot: 264.00004
Catalog: JELAC 4379
Count: BAG
Wt: 8.97 G
Object: Brick.
Material: Clay.

Lot: 264.00005
Catalog: JELAC 4380
Count: 1 EA
Wt: 0.67 G
Object: Vessel fragment.
Material: Glass.
Typology: Indef Glass (insuf portion).

Lot: 264.00006
Catalog: JELAC 4381
Count: 3 EA
Wt: 1.37 G
Object: Nail.
Material: Iron.
Typology: Machine Cut Nail.

Lot: 264.00007
Catalog: JELAC 4382
Count: 2 EA
Wt: 1.71 G
Object: Nail.
Material: Steel.
Typology: Machine Wire Nail.

Lot: 265.00001
Catalog: JELAC 4383
Count: 1 EA
Wt: 2.46 G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 265.00002
Catalog: JELAC 4384
Count: 1 EA
Wt: 40.12 G
Object: Bottle.
Material: Glass.
Typology: Finish, One Part.
Typology: Container Glass.

Lot: 266.00001
Catalog: JELAC 4385
Count: 1 EA
Wt: 3.91 G
Object: Bullet.
Material: Lead.
Material: Brass.
Typology: Jacketed and Round Nose.

Lot: 267.00001
Catalog: JELAC 4386
Count: 1 EA
Wt: 11.55 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 268.00001
Catalog: JELAC 4387
Count: 1 EA
Wt: 1.69 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 269.00001
Catalog: JELAC 4388
Count: 1 EA
Wt: 9.41 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 270.00001
Catalog: JELAC 4389
Count: 56 EA
Wt: 227.6 G
Object: Wire, barbed.
Material: Steel.

Lot: 271.00001
Catalog: JELAC 4390
Count: 1 EA
Wt: 229.5 G
Object: Bolt.
Material: Iron.
Typology: Bolt.

Lot: 272.00001
Catalog: JELAC 4391
Count: 1 EA
Wt: 2.03 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 273.00001
Catalog: JELAC 4392
Count: 1 EA
Wt: 2.96 G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 274.00001
Catalog: JELAC 4393
Count: 1 EA
Wt: 26.64 G
Object: Bullet, minie.
Material: Lead.
Typology: Non-Jacketed and Round Nose Minie Ball.

Lot: 275.00001
Catalog: JELAC 4394
Count: 1 EA
Wt: 20.92 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 276.00001
Catalog: JELAC 4395
Count: 1 EA
Wt: 2.06 G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 277.00001
Catalog: JELAC 4396
Count: 1 EA
Wt: 3.32 G
Object: Button, military.
Material: Brass.
Typology: Button, Two Component.

Lot: 278.00001
Catalog: JELAC 4397
Count: 1 EA
Wt: 2.96 G
Object: Coin.
Material: Zinc.
Material: Tin.
Material: Copper.
Typology: Penny.

Lot: 279.00001
Catalog: JELAC 4398
Count: 1 EA
Wt: 24.26 G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 280.00001
Catalog: JELAC 4399
Count: 1 EA
Wt: 2.95 G
Object: Coin.
Material: Copper.
Material: Tin.
Material: Zinc.
Typology: Penny.

Lot: 281.00001
Catalog: JELAC 4400
Count: 1 EA
Wt: 2.71 G
Object: Coin.
Material: Tin.
Material: Zinc.
Material: Copper.
Typology: Penny.

Lot: 282.00001
Catalog: JELAC 4401
Count: 1 EA
Wt: 2.38 G
Object: Insignia, military.
Material: Brass.

Lot: 283.00001
Catalog: JELAC 4402
Count: 1 EA
Wt: 2.50 G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 284.00001
Catalog: JELAC 4403
Count: 1 EA
Wt: 2.86 G
Object: Coin.
Material: Tin.
Material: Zinc.
Material: Copper.
Typology: Penny.

Lot: 285.00001
Catalog: JELAC 4404
Count: 1 EA
Wt: 4.82G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 286.00001
Catalog: JELAC 4405
Count: 1 EA
Wt: 2.26G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 287.00001
Catalog: JELAC 4406
Count: 1 EA
Wt: 32.73G
Object: Bullet, minie.
Material: Lead.
Typology: Non-Jacketed and Round Nose Minie Ball.

Lot: 288.00001
Catalog: JELAC 4407
Count: 1 EA
Wt: 31.02G
Object: Bullet, minie.
Material: Lead.
Typology: Non-Jacketed and Round Nose Minie Ball.

Lot: 289.00001
Catalog: JELAC 4408
Count: 1 EA
Wt: 26.02G
Object: Bullet, minie.
Material: Lead.
Typology: Non-Jacketed and Round Nose Minie Ball.

Lot: 290.00001
Catalog: JELAC 4409
Count: BAG
Wt: 6.85G
Object: Metal fragment.
Material: Lead.

Lot: 291.00001
Catalog: JELAC 4410
Count: 1 EA
Wt: 2.79G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 292.00001
Catalog: JELAC 4411
Count: 1 EA
Wt: 16.41G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 293.00001
Catalog: JELAC 4412
Count: 1 EA
Wt: 2.98G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 294.00001
Catalog: JELAC 4413
Count: 1 EA
Wt: 2.63G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 295.00001
Catalog: JELAC 4414
Count: 1 EA
Wt: 22.93G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 296.00001
Catalog: JELAC 4415
Count: 1 EA
Wt: 22.91G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 297.00001
Catalog: JELAC 4416
Count: 1 EA
Wt: 28.09G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 298.00001
Catalog: JELAC 4417
Count: 1 EA
Wt: 16.26G
Object: Cutter, glass.
Material: Iron.

Lot: 299.00001
Catalog: JELAC 4418
Count: 1 EA
Wt: 50.38G
Object: Spike.
Material: Iron.

Lot: 300.00001
Catalog: JELAC 4419
Count: 1 EA
Wt: 24.51G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 301.00001
Catalog: JELAC 4420
Count: 1 EA
Wt: 26.43G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 302.00001
Catalog: JELAC 4421
Count: 1 EA
Wt: 2.39G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 303.00001
Catalog: JELAC 4422
Count: 1 EA
Wt: 2.63G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 304.00001
Catalog: JELAC 4423
Count: BAG
Wt: 21.45G
Object: Metal fragment.
Material: Lead.

Lot: 305.00001
Catalog: JELAC 4424
Count: 1 EA
Wt: 29.99G
Object: Bullet, minie.
Material: Lead.
Typology: Non-Jacketed and Round Nose Minie Ball.

Lot: 306.00001
Catalog: JELAC 4425
Count: BAG
Wt: 5.42G
Object: Metal fragment.
Material: Lead.

Lot: 307.00001
Catalog: JELAC 4426
Count: 1 EA
Wt: 17.33G
Object: Buckle.
Material: Brass.

Lot: 308.00001
Catalog: JELAC 4427
Count: 1 EA
Wt: 1.81G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 309.00001
Catalog: JELAC 4428
Count: 1 EA
Wt: 26.20G
Object: Bar.
Material: Lead.

Lot: 310.00001
Catalog: JELAC 4429
Count: 1 EA
Wt: 3.67G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 311.00001
Catalog: JELAC 4430
Count: BAG
Wt: 51.66G
Object: Metal fragment.
Material: Lead.

Lot: 312.00001
Catalog: JELAC 4431
Count: BAG
Wt: 16.20G
Object: Metal fragment.
Material: Lead.

Lot: 313.00001
Catalog: JELAC 4432
Count: 1 EA
Wt: 3.11G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 314.00001
Catalog: JELAC 4433
Count: 1 EA
Wt: 68.21G
Object: Wedge.
Material: Iron.

Lot: 315.00001
Catalog: JELAC 4434
Count: 1 EA
Wt: 4.78G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 315.00002
Catalog: JELAC 4435
Count: 1 EA
Wt: 4.82G
Object: Coin.
Material: Nickel.
Material: Copper.
Typology: Five Cent.

Lot: 316.00001
Catalog: JELAC 4436
Count: 1 EA
Wt: 2.87G
Object: Coin.
Material: Tin.
Material: Zinc.
Material: Copper.
Typology: Penny.

Lot: 317.00001
Catalog: JELAC 4437
Count: 1 EA
Wt: 26.76G
Object: Buckle.
Material: Iron.
Material: Brass.

Lot: 318.00001
Catalog: JELAC 4438
Count: 1 EA
Wt: 2.84G
Object: Coin.
Material: Copper.
Material: Tin.
Material: Zinc.
Typology: Penny.

Lot: 319.00001
Catalog: JELAC 4439
Count: 1 EA
Wt: 2.58G
Object: Coin.
Material: Copper.
Material: Tin.
Material: Zinc.
Typology: Penny.

Lot: 320.00001
Catalog: JELAC 4440
Count: 1 EA
Wt: 24.86G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 321.00001
Catalog: JELAC 4441
Count: 1 EA
Wt: 24.95G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 322.00001
Catalog: JELAC 4442
Count: BAG
Wt: 1.03G
Object: Metal fragment.
Material: Aluminum.

Lot: 322.00002
Catalog: JELAC 4443
Count: 3 EA
Wt: 19.69G
Object: Vessel fragment.
Material: Clay.
Type: Pearlware.
Typology: Earthenware, Refined, Pearlware.

Lot: 323.00001
Catalog: JELAC 4444
Count: 1 EA
Wt: 4.49G
Object: Coin.
Material: Copper.
Material: Nickel.
Typology: Five Cent.

Lot: 324.00001
Catalog: JELAC 4445
Count: 1 EA
Wt: 29.08G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 325.00001
Catalog: JELAC 4446
Count: 1 EA
Wt: 2.02G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 326.00001
Catalog: JELAC 4447
Count: 1 EA
Wt: 2.95G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 327.00001
Catalog: JELAC 4448
Count: 1 EA
Wt: 3.30G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 328.00001
Catalog: JELAC 4449
Count: 1 EA
Wt: 19.15G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 329.00001
Catalog: JELAC 4450
Count: 1 EA
Wt: 2.07G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 330.00001
Catalog: JELAC 4451
Count: BAG
Wt: 30.35G
Object: Metal fragment.
Material: Iron.

Lot: 331.00001
Catalog: JELAC 4452
Count: 1 EA
Wt: 32.11G
Object: Bolt.
Material: Iron.
Typology: Bolt.

Lot: 332.00001
Catalog: JELAC 4453
Count: 1 EA
Wt: 3.56G
Object: Rivet.
Material: Brass.

Lot: 333.00001
Catalog: JELAC 4454
Count: 1 EA
Wt: 2.43G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 334.00001
Catalog: JELAC 4455
Count: 28 EA
Wt: 516.60G
Object: Chain.
Material: Iron.

Lot: 335.00001
Catalog: JELAC 4456
Count: BAG
Wt: 0.29G
Object: Metal fragment.
Material: Lead.

Lot: 336.00001
Catalog: JELAC 4457
Count: 1 EA
Wt: 2.91G
Object: Coin.
Material: Copper.
Material: Zinc.
Material: Tin.
Typology: Penny.

Lot: 337.00001
Catalog: JELAC 4458
Count: 1 EA
Wt: 2.94G
Object: Coin.
Material: Zinc.
Material: Copper.
Material: Tin.
Typology: Penny.

Lot: 338.00001
Catalog: JELAC 4459
Count: 1 EA
Wt: 9.27G
Object: Insignia, military.
Material: Brass.

Lot: 339.00001
Catalog: JELAC 4460
Count: 1 EA
Wt: 4.62G
Object: Marble.
Material: Kaolinite Clay.
Typology: Pipe Clay.

Lot: 339.00002
Catalog: JELAC 4461
Count: 1 EA
Wt: 3.04G
Object: Coin.
Material: Zinc.
Material: Tin.
Material: Copper.
Typology: Penny.

Lot: 340.00001
Catalog: JELAC 4462
Count: 1 EA
Wt: 39.66G
Object: Buckle.
Material: Iron.

Lot: 341.00001
Catalog: JELAC 4463
Count: 1 EA
Wt: 25.23G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 342.00001
Catalog: JELAC 4464
Count: 1 EA
Wt: 17.81G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 343.00001
Catalog: JELAC 4465
Count: 1 EA
Wt: 2.43G
Object: Rivet.
Material: Brass.

Lot: 344.00001
Catalog: JELAC 4466
Count: BAG
Wt: 42.53G
Object: Metal fragment.
Material: Lead.

Lot: 345.00001
Catalog: JELAC 4467
Count: 1 EA
Wt: 2.96G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 346.00001
Catalog: JELAC 4468
Count: 1 EA
Wt: 93.91G
Object: Bolt.
Material: Iron.
Typology: Bolt.

Lot: 347.00001
Catalog: JELAC 4469
Count: 1 EA
Wt: 2.85G
Object: Coin.
Material: Tin.
Material: Copper.
Material: Zinc.
Typology: Penny.

Lot: 348.00001
Catalog: JELAC 4470
Count: 1 EA
Wt: 2.26G
Object: Ring.
Material: Brass.

Lot: 349.00001
Catalog: JELAC 4471
Count: 1 EA
Wt: 3.23G
Object: Shot, buck.
Material: Lead.
Typology: Buckshot.

Lot: 350.00001
Catalog: JELAC 4472
Count: BAG
Wt: 40.43G
Object: Metal fragment.
Material: Lead.

Lot: 351.00001
Catalog: JELAC 4473
Count: 1 EA
Wt: 1329.7G
Object: Cannonball.
Material: Iron.

Lot: 352.00001
Catalog: JELAC 4474
Count: 1 EA
Wt: 483.40G
Object: Hardware.
Material: Iron.

Lot: 353.00001
Catalog: JELAC 4475
Count: BAG
Wt: 0.10G
Object: Metal fragment.
Material: Aluminum.

Lot: 354.00001
Catalog: JELAC 4476
Count: BAG
Wt: 17.57G
Object: Metal fragment.
Material: Lead.

Lot: 355.00001
Catalog: JELAC 4477
Count: BAG
Wt: 7.99G
Object: Metal fragment.
Material: Brass.

Lot: 356.00001
Catalog: JELAC 4478
Count: 1 EA
Wt: 17.56G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 357.00001
Catalog: JELAC 4479
Count: BAG
Wt: 7.67G
Object: Metal fragment.
Material: Brass.

Lot: 358.00001
Catalog: JELAC 4480
Count: 1 EA
Wt: 4.10G
Object: Pendant, religious.
Material: Silver.

Lot: 359.00001
Catalog: JELAC 4481
Count: 1 EA
Wt: 28.87G
Object: Ball, musket.
Material: Lead.
Typology: Musket Ball.

Lot: 360.00001
Catalog: JELAC 4482
Count: 1 EA
Wt: 61.35G
Object: Watch, pocket.
Material: Leather.
Material: Copper Alloy.

Lot: 361.00001
Catalog: JELAC 4483
Count: 1 EA
Wt: 9.81G
Object: Bullet.
Material: Lead.
Typology: Non-Jacketed and Round Nose.

Lot: 362.00001
Catalog: JELAC 4484
Count: BAG
Wt: 0.79G
Object: Brick.
Material: Clay.

Lot: 363.00001
Catalog: JELAC 4485
Count: BAG
Wt: 245.80G
Object: Sample, soil.
Typology: Sample.

Lot: 364.00001
Catalog: JELAC 4486
Count: BAG
Wt: 184.00G
Object: Sample, soil.
Typology: Sample.

Lot: 365.00001
Catalog: JELAC 4487
Count: BAG
Wt: 200.70G
Object: Sample, soil.
Typology: Sample.

Lot: 366.00001
Catalog: JELAC 4488
Count: BAG
Wt: 215.60G
Object: Sample, soil.
Typology: Sample.

Lot: 367.00001
Catalog: JELAC 4489
Count: BAG
Wt: 227.50G
Object: Sample, soil.
Typology: Sample.

Lot: 369.00001
Catalog: JELAC 4490
Count: BAG
Wt: 178.60G
Object: Sample, soil.
Typology: Sample.

Lot: 370.00001
Catalog: JELAC 4491
Count: BAG
Wt: 171.90G
Object: Sample, soil.
Typology: Sample.

Lot: 371.00001
Catalog: JELAC 4492
Count: BAG
Wt: 175.70G
Object: Sample, soil.
Typology: Sample.

Lot: 372.00001
Catalog: JELAC 4493
Count: BAG
Wt: 179.10G
Object: Sample, soil.
Typology: Sample.

Appendix C

MUSKET BALL CALIBER

Name	Fired/Unfired	Measure	Weight	Calculated Caliber
Ball, musket.	Fired.	—	11.55	0.50
Ball, musket.	Unfired.	0.504	12.56	0.52
Ball, musket.	Fired.	—	12.78	0.52
Ball, musket.	Fired.	—	14.08	0.54
Ball, musket.	Fired.	—	16.41	0.57
Ball, musket.	Fired.	—	17.56	0.58
Ball, musket.	Fired.	—	17.57	0.58
Ball, musket.	Unfired.	0.580	17.81	0.58
Ball, musket.	Fired.	—	18.38	0.59
Ball, musket.	Fired.	—	19.15	0.60
Ball, musket.	Fired.	—	20.92	0.61
Ball, musket.	Fired.	—	21.44	0.62
Ball, musket.	Fired.	—	22.08	0.63
Ball, musket.	Fired.	—	22.77	0.63
Ball, musket.	Fired.	—	22.91	0.63
Ball, musket.	Unfired.	0.640	22.93	0.63
Ball, musket.	Fired.	—	23.70	0.64
Ball, musket.	Pulled.	0.640	24.26	0.65
Ball, musket.	Fired.	—	24.51	0.65
Ball, musket.	Fired.	—	24.69	0.65
Ball, musket.	Unfired.	0.640	24.86	0.65
Ball, musket.	Unfired.	0.640	24.95	0.65
Ball, musket.	Unfired.	0.640	25.23	0.65
Ball, musket.	Fired.	—	26.22	0.66
Ball, musket.	Fired.	—	26.43	0.66
Ball, musket.	Unfired.	0.690	28.09	0.68
Ball, musket.	Fired.	—	28.87	0.68
Ball, musket.	Unfired.	0.690	29.08	0.69
Ball, musket.	Unfired.	0.688	31.50	0.70

Appendix D

GLOBAL POSITIONING DATA VERSUS LASER TRANSIT

In order to access the effectiveness of GPS as a battlefield mapping tool compared to the laser transit a test program was implemented. A GPS grid was established and the laser transit was registered to this grid. The MDETs had been previously recorded using GPS. The majority of the points were then recorded using the laser transit. The Cartesian coordinates for each of the two systems were produced and subtracted to determine the degree of variance. The results were very surprising. The average difference was 1.82 meters with the maximum difference being 6.48 meters. These results were much larger than expected. The reason for this large discrepency is not known and additional testing will be undertaken. When the data from the first station was used, excluding offset shots, the average difference was 1.95 meter and the maximum difference 2.53 meters.

Transit East	Transit North	Point	GPS East	GPS North	Variation	SD
211289.332	3316351.140	A1	211288.319	3316348.906	2.45	10.60
211426.398	3316229.479	A10	211427.349	3316228.371	1.46	-6.05
211429.566	3316231.562	A11	211428.856	3316230.053	1.67	-2.57
210888.025	3315788.784	A111	210888.156	3315788.793	0.13	-28.34
210896.091	3315785.443	A112	210896.596	3315785.629	0.54	-21.52
210897.173	3315788.458	A113	210897.026	3315789.292	0.85	-16.34
210898.765	3315787.363	A114	210898.708	3315788.022	0.66	-19.45
210897.818	3315788.844	A115	210897.411	3315789.333	0.64	-19.87
210897.324	3315786.627	A116	210897.005	3315787.254	0.70	-18.74
210888.393	3315822.463	A117	210888.518	3315823.629	1.17	-10.87
210901.435	3315793.967	A118	210901.291	3315794.836	0.88	-15.77
211426.878	3316230.706	A12	211427.405	3316230.261	0.69	-18.97
211437.016	3316267.395	A13	211434.015	3316268.305	3.14	22.06
211385.935	3316305.227	A14	211383.801	3316302.991	3.09	21.30
211367.450	3316308.104	A15	211366.025	3316306.316	2.29	7.81
211321.730	3316338.757	A16	211322.305	3316337.582	1.31	-8.60
211318.307	3316334.592	A17	211316.339	3316331.517	3.65	30.69
211297.572	3316146.176	A18	211295.524	3316145.584	2.13	5.21
211308.200	3316140.663	A19	211306.837	3316139.781	1.62	-3.31
211298.783	3316341.965	A2	211297.121	3316340.103	2.50	11.32
211356.630	3316181.199	A20	211358.794	3316182.014	2.31	8.24
211151.447	3316061.371	A23	211149.172	3316060.693	2.37	9.27
211256.445	3316393.427	A24	211259.035	3316392.202	2.87	17.51
211261.125	3316366.564	A25	211262.843	3316365.552	1.99	2.90
211589.777	3315993.426	A26	211588.614	3315992.262	1.65	-2.94
211586.160	3315987.069	A27	211588.415	3315985.767	2.60	13.13
211578.713	3315969.474	A28	211580.589	3315968.740	2.01	3.25
211510.045	3316039.965	A29	211512.425	3316038.036	3.06	20.84
211338.240	3316286.937	A3	211337.537	3316284.787	2.26	7.40
211232.580	3316052.717	A30	211234.177	3316051.216	2.19	6.22
211093.513	3315873.326	A31	211094.534	3315872.355	1.41	-6.91
211074.004	3315835.215	A32	211074.575	3315834.371	1.02	-13.45
211227.622	3315979.013	A33	211228.465	3315978.333	1.08	-12.38

Transit East	Transit North	Point	GPS East	GPS North	Variation	SD
211573.885	3315941.288	A35	211573.696	3315939.753	1.55	-4.60
211579.439	3315955.092	A36	211579.497	3315953.324	1.77	-0.87
211593.813	3315976.242	A37	211593.958	3315974.499	1.75	-1.21
211603.703	3315988.868	A38	211603.809	3315986.874	2.00	2.95
211604.732	3315999.059	A39	211605.044	3315997.054	2.03	3.49
211341.083	3316288.307	A4	211340.527	3316285.481	2.88	17.77
211622.819	3316050.191	A40	211623.589	3316047.182	3.11	21.55
211470.112	3316153.573	A41	211472.369	3316153.729	2.26	7.40
211459.355	3315719.566	A44	211456.809	3315718.063	2.96	19.05
211431.668	3315660.068	A45	211429.696	3315659.298	2.12	4.97
211413.030	3315630.918	A46	211411.500	3315629.786	1.90	1.38
211345.134	3316265.671	A5	211344.843	3316260.928	4.75	49.16
211261.503	3316376.694	A50	211261.692	3316376.270	0.46	-22.76
211263.711	3316385.583	A51	211263.815	3316385.293	0.31	-25.38
211347.851	3316266.324	A52	211349.259	3316260.923	5.58	63.08
211332.629	3316263.318	A53	211331.997	3316260.821	2.58	12.66
211347.604	3316270.525	A54	211346.767	3316271.516	1.30	-8.79
211349.828	3316272.696	A55	211349.313	3316273.066	0.63	-19.91
211380.277	3316245.926	A56	211379.943	3316244.213	1.75	-1.27
211395.420	3316233.726	A57	211393.771	3316232.632	1.98	2.65
211141.969	3316112.867	A58	211143.229	3316112.468	1.32	-8.38
211352.517	3316259.128	A6	211352.724	3316257.151	1.99	2.80
211345.007	3316233.946	A7	211346.235	3316232.291	2.06	4.02
211356.023	3316231.372	A8	211354.684	3316231.109	1.36	-7.66
211363.423	3316246.583	A9	211364.388	3316245.033	1.83	0.08
211043.068	3315959.014	C1	211041.263	3315958.443	1.89	1.21
211127.837	3316089.890	C10	211125.761	3316089.394	2.13	5.26
211133.919	3316101.799	C11	211132.016	3316101.611	1.91	1.53
211128.300	3316090.588	C12	211126.159	3316090.050	2.21	6.48
211140.564	3316113.125	C13	211138.808	3316112.667	1.81	-0.10
211139.683	3316105.227	C14	211137.856	3316104.683	1.91	1.43
211140.191	3316106.068	C15	211138.457	3316105.370	1.87	0.81
211140.988	3316108.132	C16	211139.338	3316107.591	1.74	-1.42
211147.189	3316117.638	C17	211145.273	3316117.199	1.97	2.43
211162.529	3316145.224	C18	211160.621	3316144.974	1.92	1.73
211234.617	3316255.895	C19	211233.293	3316254.881	1.67	-2.57
211237.989	3316250.656	C20	211236.933	3316250.130	1.18	-10.76
211375.561	3316313.372	C21	211374.250	3316313.740	1.36	-7.70
211279.410	3316370.029	C22	211278.762	3316368.828	1.36	-7.65
211268.713	3316381.920	C24	211270.798	3316380.989	2.28	7.76
211267.702	3316381.462	C25	211269.005	3316379.836	2.08	4.41
211479.113	3315899.442	C26	211481.012	3315898.559	2.09	4.58
211471.118	3315890.446	C27	211472.166	3315889.352	1.51	-5.13
211472.932	3315887.779	C28	211475.165	3315886.734	2.47	10.81
211441.999	3315819.963	C29	211443.871	3315819.333	1.98	2.59
211048.696	3315972.711	C3	211046.736	3315972.344	1.99	2.90
211183.529	3316035.107	C30	211185.182	3316033.988	2.00	2.94
211169.187	3316011.752	C31	211170.880	3316010.693	2.00	2.95
211118.481	3315936.831	C32	211119.674	3315935.200	2.02	3.35
211070.444	3315854.340	C33	211071.572	3315853.363	1.49	-5.51
211068.099	3315850.547	C34	211068.395	3315850.072	0.56	-21.16
211067.044	3315851.010	C35	211067.689	3315850.542	0.80	-17.18
211125.875	3315870.897	C36	211123.381	3315870.867	2.49	11.29
211203.908	3315972.390	C37	211204.992	3315971.940	1.17	-10.86

Transit East	Transit North	Point	GPS East	GPS North	Variation	SD
211284.056	3316088.241	C38	211285.092	3316087.442	1.31	-8.60
211093.819	3316036.203	C4	211091.736	3316035.794	2.12	5.06
211098.306	3316041.357	C5	211096.313	3316040.584	2.14	5.31
211099.906	3316043.289	C6	211097.900	3316042.753	2.08	4.28
211098.515	3316049.639	C7	211096.458	3316048.990	2.16	5.64
211102.233	3316046.891	C8	211100.137	3316046.090	2.24	7.09
211102.818	3316047.215	C9	211100.665	3316046.547	2.25	7.27
211137.022	3315992.379	G1	211134.817	3315991.738	2.30	7.97
211199.319	3316087.273	G2	211197.336	3316086.965	2.01	3.12
211204.799	3316091.728	G3	211203.023	3316091.344	1.82	-0.07
211388.536	3316369.876	G4	211389.275	3316368.043	1.98	2.61
211045.869	3315957.766	H1	211043.962	3315957.231	1.98	2.68
211446.688	3315827.357	H12	211448.348	3315826.602	1.82	0.04
211383.036	3315830.005	H13	211384.696	3315829.853	1.67	-2.58
211212.610	3316044.848	H14	211213.904	3316043.680	1.74	-1.30
211083.189	3315875.603	H15	211084.044	3315875.148	0.97	-14.30
211071.097	3315852.079	H16	211071.787	3315851.272	1.06	-12.73
211072.031	3315850.157	H17	211072.375	3315849.308	0.92	-15.18
211275.902	3316058.384	H18	211276.859	3316058.122	0.99	-13.90
211058.955	3315974.430	H2	211056.934	3315973.741	2.14	5.27
211064.612	3315983.274	H3	211062.538	3315983.001	2.09	4.54
211179.327	3316158.831	H4	211177.619	3316158.628	1.72	-1.69
211410.035	3316306.753	H5	211406.136	3316304.690	4.41	43.45
211403.688	3316313.735	H6	211400.487	3316312.388	3.47	27.71
211085.764	3315991.212	J1	211083.741	3315990.850	2.06	3.93
211179.739	3315936.032	J10	211180.991	3315935.960	1.25	-9.51
210914.738	3315792.221	J108	210914.142	3315793.135	1.09	-12.24
210919.847	3315793.989	J109	210916.736	3315794.024	3.11	21.64
211577.958	3316091.612	J114	211577.263	3316089.206	2.50	11.46
211580.173	3316098.677	J115	211580.152	3316097.206	1.47	-5.87
211105.550	3316032.189	J2	211103.331	3316031.498	2.32	8.44
211195.262	3316388.170	J200	211196.887	3316387.377	1.81	-0.21
211177.966	3316343.306	J201	211178.765	3316342.981	0.86	-16.08
211111.308	3316039.308	J3	211109.266	3316038.724	2.12	5.08
211144.211	3316086.106	J4	211142.139	3316085.808	2.09	4.57
211171.670	3316138.227	J5	211169.967	3316138.002	1.72	-1.73
211198.078	3316166.866	J6	211196.461	3316166.527	1.65	-2.83
211347.114	3316305.025	J7	211348.021	3316304.726	0.96	-14.53
211432.377	3315988.924	J8	211434.732	3315987.558	2.72	15.12
211452.411	3316028.810	J9	211454.203	3316027.283	2.35	8.95
211221.357	3316337.423	L1	211219.909	3316337.026	1.50	-5.36
211308.679	3316289.672	L10	211307.901	3316288.309	1.57	-4.22
210886.253	3315793.816	L108	210885.868	3315793.721	0.40	-23.80
210895.364	3315791.595	L109	210892.902	3315791.506	2.46	10.78
211313.221	3316279.902	L11	211312.139	3316278.465	1.80	-0.37
210890.760	3315777.474	L110	210890.451	3315777.921	0.54	-21.43
210901.023	3315786.902	L111	210899.847	3315787.043	1.18	-10.68
210894.574	3315783.225	L112	210894.227	3315783.509	0.45	-23.02
210896.711	3315786.150	L113	210896.215	3315786.754	0.78	-17.43
210898.052	3315784.307	L114	210897.344	3315784.612	0.77	-17.61
210900.719	3315787.539	L115	210901.001	3315787.952	0.50	-22.16
210901.748	3315788.466	L116	210902.512	3315788.904	0.88	-15.77
211495.303	3316212.845	L117	211501.724	3316211.941	6.48	78.22
211309.479	3316246.876	L12	211310.131	3316245.002	1.98	2.74

Transit East	Transit North	Point	GPS East	GPS North	Variation	SD
211219.350	3316433.120	L121	211220.890	3316432.017	1.89	1.23
211188.496	3316385.725	L122	211189.789	3316385.257	1.38	-7.48
211195.668	3316395.396	L123	211194.802	3316395.189	0.89	-15.61
211291.052	3316254.067	L13	211292.123	3316250.800	3.44	27.12
211303.093	3316243.137	L14	211302.443	3316241.861	1.43	-6.52
211309.202	3316236.711	L15	211309.168	3316236.349	0.36	-24.45
211329.767	3316222.364	L16	211328.807	3316219.944	2.60	13.13
211406.664	3316231.384	L17	211404.928	3316230.416	1.99	2.8
211421.467	3316220.485	L18	211421.297	3316220.228	0.31	-25.38
211426.503	3316218.744	L19	211425.884	3316217.468	1.42	-6.76
211230.985	3316350.022	L2	211229.321	3316349.528	1.74	-1.43
211346.848	3316299.482	L20	211346.110	3316297.647	1.98	2.63
211251.165	3316167.935	L21	211249.368	3316166.876	2.09	4.44
211345.184	3316114.013	L22	211343.271	3316113.357	2.02	3.38
211051.169	3315956.430	L23	211049.006	3315955.707	2.28	7.71
211065.076	3315977.364	L24	211063.053	3315976.725	2.12	5.04
211098.750	3316026.660	L25	211096.937	3316026.231	1.86	0.71
211133.111	3316069.935	L26	211131.198	3316069.588	1.94	2.07
211143.080	3316097.765	L27	211141.119	3316097.234	2.03	3.53
211150.324	3316108.997	L28	211148.417	3316108.262	2.04	3.74
211152.601	3316111.602	L29	211150.917	3316111.553	1.68	-2.29
211235.910	3316347.975	L3	211234.358	3316347.504	1.62	-3.34
211398.889	3316325.992	L30	211399.962	3316323.731	2.50	11.44
211263.538	3316372.395	L32	211265.778	3316371.378	2.46	10.72
211262.364	3316346.826	L33	211260.939	3316346.128	1.59	-3.93
211526.122	3315967.631	L34	211524.059	3315969.747	2.96	19.03
211495.247	3315914.307	L35	211497.244	3315913.348	2.22	6.61
211281.039	3316109.096	L36	211282.918	3316107.678	2.35	8.94
211207.386	3316033.492	L37	211208.656	3316032.590	1.56	-4.42
211174.012	3315984.021	L38	211175.009	3315982.733	1.63	-3.22
211132.403	3315837.761	L39	211132.581	3315837.283	0.51	-21.99
211269.317	3316325.198	L4	211266.807	3316324.852	2.53	11.96
211311.282	3316057.454	L40	211311.816	3316056.646	0.97	-14.3
211354.423	3316112.589	L41	211355.621	3316111.418	1.68	-2.44
211334.280	3316060.992	L42	211335.389	3316060.576	1.18	-10.68
211271.683	3316321.361	L5	211271.386	3316320.567	0.85	-16.32
211273.258	3316320.302	L6	211273.257	3316318.779	1.52	-5
211270.018	3316318.892	L7	211269.566	3316317.231	1.72	-1.67
211272.089	3316315.215	L8	211271.727	3316313.615	1.64	-3.03
211273.778	3316312.415	L9	211274.218	3316311.350	1.15	-11.22
211503.048	3316255.170	M101	211502.054	3316254.934	1.02	-13.41
210906.599	3315793.821	M108	210905.747	3315795.376	1.77	-0.8
210908.753	3315793.986	M109	210907.584	3315794.916	1.49	-5.49
210899.852	3315790.925	M110	210899.969	3315791.629	0.71	-18.57
210897.902	3315793.126	M111	210897.903	3315793.476	0.35	-24.67
210898.820	3315800.651	M112	210898.951	3315800.922	0.30	-25.5
210899.210	3315797.020	M113	210900.092	3315797.549	1.03	-13.29
211269.256	3316318.850	R1	211269.124	3316318.217	0.65	-19.7
211428.745	3315897.844	R10	211430.701	3315896.449	2.40	9.75
210894.932	3315780.503	R103	210894.725	3315780.854	0.41	-23.71
210913.249	3315760.733	R104	210913.185	3315761.200	0.47	-22.64
211205.377	3316029.880	R11	211206.218	3316029.093	1.15	-11.22
211194.702	3316014.647	R12	211195.724	3316013.704	1.39	-7.22
211142.110	3315924.967	R13	211143.211	3315923.755	1.64	-3.08

Transit East	Transit North	Point	GPS East	GPS North	Variation	SD
211363.058	3316250.412	R2	211363.031	3316249.427	0.99	-14.00
211399.219	3316241.694	R3	211398.446	3316240.193	1.69	-2.22
211086.946	3315978.686	R7	211085.097	3315978.108	1.94	1.95
211355.047	3316333.495	R9	211352.449	3316331.413	3.33	25.30
211241.513	3316357.396	T1	211240.197	3316356.866	1.42	-6.75
211362.891	3316362.758	T10	211360.360	3316360.293	3.53	28.72
211261.178	3316398.877	T11	211263.462	3316397.938	2.47	10.88
211447.070	3315899.761	T12	211449.156	3315898.166	2.63	13.50
211462.394	3315951.270	T13	211464.142	3315949.662	2.38	9.30
211507.452	3316014.767	T14	211508.987	3316012.885	2.43	10.19
211251.477	3316081.308	T15	211253.072	3316079.995	2.07	4.11
211177.595	3315876.314	T16	211178.391	3315874.906	1.62	-3.41
211229.289	3315977.020	T17	211230.261	3315975.966	1.43	-6.49
211324.858	3316270.955	T2	211324.084	3316267.880	3.17	22.64
211310.056	3316230.518	T3	211306.521	3316230.225	3.55	28.95
211325.842	3316223.199	T4	211325.161	3316222.048	1.34	-8.11
211327.154	3316230.747	T5	211327.280	3316229.200	1.55	-4.51
211367.386	3316254.409	T6	211368.019	3316251.671	2.81	16.59
211373.229	3316249.030	T7	211370.737	3316247.700	2.82	16.84
211295.898	3316158.929	T8	211293.947	3316158.306	2.05	3.81
211298.473	3316159.887	T9	211296.607	3316159.459	1.91	1.57

Average	1.82
Maximum	6.48
Minimum	0.13

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