5,000 Years of Aboriginal Land Use in the Western Phoenix Basin

The Luke Air Force Base Solar Project

Volume 1: Project Background and Excavation Results

Edited by
John D. Hall and Robert M. Wegener

Statistical Research
Technical Series 95

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Edited by
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With contributions by
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ABSTRACT

This document is the first of two volumes and presents the project background and excavation results for the Luke Air Force Base (LAFB) Solar-Power Array Archaeological Data Recovery Project (Luke Solar project). The Luke Solar project was conducted in advance of a planned 107-acre, 17-megawatt solar-power array to be constructed on an undeveloped portion of LAFB, near the town of Glendale, Arizona. This project was carried out for LAFB under Contract No. W9126G-10-D-0023, Task Order 003, sponsored by the U.S. Army Corps of Engineers, Fort Worth District; Aerostar Environmental Services, Inc.; and Statistical Research, Inc. (SRI). Between November 2010 and April 2013, SRI conducted archaeological data recovery at five archaeological sites on LAFB. Originally, the project contained seven archaeological sites: AZ T:7:68 (ASM), AZ T:7:419 (ASM), AZ T:7:420 (ASM), AZ T:7:421 (ASM), AZ T:7:422 (ASM), AZ T:7:423 (ASM), and AZ T:7:424 (ASM). As a result of SRI's Phase 1 testing, AZ T:7:419 (ASM), AZ T:7:420 (ASM), AZ T:7:421 (ASM), and AZ T:7:422 (ASM) were combined into one large, contiguous archaeological site known as Falcon Landing. This site represents the largest buried Archaic period site documented to date in the Phoenix Basin. An additional new site, AZ T:7:437 (ASM), was identified during the Phase 2 data recovery. The four prehistoric sites included in this volume are: Falcon Landing (AZ T:7:419 [ASM]), AZ T:7:68 (ASM), AZ T:7:423 (ASM), and AZ T:7:437 (ASM). AZ T:7:423 (ASM) and AZ T:7:437 (ASM) are located entirely within LAFB property. Falcon Landing and AZ T:7:68 (ASM) both extend beyond the boundaries of LAFB, and unknown portions of those sites exist outside the project area and therefore outside the scope of this investigation. In addition, a Historical period site, Rancho La Loma Well (AZ T:7:424 [ASM]), was investigated as part of the Luke Solar project; the results of archival research and field studies for that site are presented below.

This volume outlines the environmental and cultural setting of the region surrounding LAFB, the research themes used to investigate the project data, and the methods used to collect field data, as well as detailed descriptions of all sites and features excavated as part of this project. The results of SRI's excavations indicate occupation of the project area began during the Early Archaic period (ca. 7000 B.C.), and lasted until the Historical period. The most intense occupation within the project area began during the Chiricahua phase of the Middle Archaic period (ca. 3500–1200 B.C.), followed by the San Pedro (ca. 1200–800 B.C.) and Cienega (ca. 800 B.C.– A.D. 50) phases of the Late Archaic period, and the Red Mountain phase (ca. A.D. 50–400) of the Early Ceramic period. In general, these occupations were characterized by residential groups who visited the project area intermittently during the spring and summer months for the procurement and processing of wild-plant resources, particularly mesquite. Later, Hohokam and Protohistoric period or Historical period Native American occupations of the project area were much less intense than earlier, Archaic period occupations and likely represented logistical task groups who visited the project area for similar plant-food-processing activities. This 5,000-year occupational span is represented by more than 3,000 buried cultural features that include structures, activity areas, extramural pits, artifact caches, charcoal/ash lenses, fire-affected-rock (FAR) concentrations, middens, human burials, and a possible reservoir. From the Middle Archaic period through the Early Ceramic period, discrete clusters of structures and associated extramural features indicate that some of the occupations represented multiple activities and, perhaps, short-term, temporary encampments. These occupations can be characterized as a palimpsest of intermittent, seasonal occupations, evidence of which became periodically buried under natural sediments, with subsequent reoccupations in later periods.

The information provided in the following chapters presents a unique look into the massive and complicated undertaking that is the Luke Solar project. The sites and features described in this volume represent an exceptional example of Archaic and Early Ceramic period use of a lower-bajada landscape in the Sonoran Desert. The information contained in this volume provides important context and is a prelude to the analysis and interpretations presented in Volume 2 of this series.

ACKNOWLEDGMENTS

The Luke Air Force Base Solar-Power Array Archaeological Data Recovery Project (Luke Solar project) was a monumental effort that involved many individuals and several government agencies. Without the concerted efforts of these people, the project would not have been a success. We would like to take this opportunity to extend our thanks to this extraordinary team.

The Luke Solar project was located on Luke Air Force Base (LAFB) and was therefore under the direct supervision of Mr. Jeff Rothrock, U.S. Air Force Air Education and Training Command, 56th Civil Engineer Squadron Natural Resources Management. In coordination with LAFB, the Arizona Public Service Company (APS) planned the development and construction of the solar-power-array, and Mr. Jon Shumaker, APS archaeologist, was instrumental to the project's success. Jon tirelessly and expertly supported the successful completion of all needed Section 106 consultation requirements. As such, Jon was also instrumental in guiding the project scoping and resolving numerous complex challenges. He was an invaluable asset and team member. Many of the project's successes are undoubtedly a direct result of his unwavering dedication.

Multiple contracts through multiple organizations supported the Luke Solar project. Weston Solutions, Inc., held the initial contract with LAFB for Phase 1 testing, and the work of Mr. Rick Logsdon, Mr. Michael Barone, and Mr. Robert Pozorski helped obtain and implement the Storm Water Pollution Prevention Plan (SWPPP) and dust-control permits throughout the course of the project. For the first phase of data recovery, Statistical Research, Inc. (SRI), maintained a contract with LAFB under the direction of Mr. Rothrock. Aerostar Environmental Services, Inc. (Aerostar), was contracted through the U.S. Army Corps of Engineers (USACE), Fort Worth District, to complete the second phase of data recovery as well as this volume. Mr. Jay Newman was the contracting officer's representative and point of contact for the USACE, and Ms. Tiffany Seibt was the Aerostar project manager. Mr. Rothrock, Mr. Newman, and Ms. Seibt worked tirelessly to keep the project moving, from a contract-management perspective. We also wish to thank Ms. Ann Howard and Ms. Kris Dobschuetz from the Arizona State Historic Preservation Office for reviewing the Historic Properties Treatment Plan (HPTP) as well as participating in multiple consultations that helped to structure the project approach.

We extend our sincere gratitude to the members of the Salt River Pima-Maricopa Indian Community (SRPMIC), the Gila River Indian Community (GRIC), the Tohono O'odham Nation (TON), the Ak-Chin Indian Community, the Fort McDowell Yavapai Nation, the Yavapai-Apache Nation, the Yavapai-Prescott Indian Tribe, and the Colorado River Indian Tribes for their cooperation and assistance throughout the entire project. Tribal representatives who visited the project area, examined the treatment plan and excavations, and provided their important insights included Mr. Shane Antone, Ms. Angela Garcia-Lewis, Mr. Jacob Butler, and Mr. Thomas Wright of the SRPMIC; Mr. Barnaby Lewis, Ms. Semana Thompson, and Mr. Larry Benallie of the GRIC; Mr. Joseph Joaquin of the TON; Ms. Caroline Antone of the Ak-Chin Indian Community; and Mr. Scott Kwiatkowski of the Yavapai-Prescott Indian Tribe. Thanks especially to Mr. Lewis and Ms. Thompson, who visited the project to perform blessings of the burial feature.

The enormous number of buried features uncovered during the Luke Solar project required a significant amount of heavy machinery. The initial test trenching and SWPPP installation was performed by Red J Environmental Corp. The remainder of the testing and data recovery phases, including the mechanical stripping of more than 45 acres, was mightily executed by Casey's Backhoe Service, operated by Mr. Keith Tanko. Mr. David Thompson ran one of the trackhoes for the entire project, and Mr. Greg Albertson ran the second trackhoe for the last phase of data recovery. Mr. Roger Lane, Mr. Kenneth Hogan, and Mr. Mark Kear ran backhoes intermittently throughout the project. Mr. Kevin Delaney, Mr. Steve Desautel, Mr. Kear, Mr. David Lambert, and Mr. Scott Hilliard ran front-end loaders nonstop, to keep the trackhoes moving, as

well as water trucks to comply with the dust-control permits. The quality of the work performed by Casey's Backhoe Service cannot be overemphasized.

The importance of the Luke Solar project is evidenced in the number of people who contributed to this long and complicated undertaking. Successfully navigating a project of this magnitude required the talents of many. Dr. Jeffrey H. Altschul, SRI's cofounder and principal, worked closely with the project staff to help guide us through a complex contractual and regulatory environment. Dr. Teresita Majewski, SRI's Vice President, supported SRI Principal Investigator Mr. Robert Wegener in the management of the Air Force, Aerostar, and Weston Solutions, Inc., contracts. All day-to-day aspects of the Luke Solar project were directly supervised by Mr. Robert M. Wegener, who served as principal investigator through the entirety of the project. Mr. Wegener was supported by Mr. John D. Hall, who served as senior project director in all stages of research, from developing the testing and data recovery plans and directing all phases of fieldwork to preparing this volume. Mr. Hall was assisted in these tasks by two co-project directors, Mr. Mitchell A. Keur and Dr. Jesse A. M. Ballenger. Both Mr. Keur and Dr. Ballenger were instrumental in maintaining the project momentum and coordinating the multitude of tasks required to run a large project. Mr. Hall, Mr. Keur, and Dr. Ballenger had much help from assistant project directors Ms. Heather J. Miljour, Ms. Amelia M. Natoli, Mr. James Marsh, and Mr. Steven Ditschler. Ms. Natoli spent many months supervising the mechanical excavations, which ultimately led to uncovering nearly 46 acres of cultural resources and more than 3,000 features. Ms. Natoli had help from several other archaeological monitors, including Mr. Marsh, Mr. Ditschler, Mr. Jeffrey Charest, Ms. Jessica South, Ms. Cannon Daughtrey, Dr. Ballenger, and Mr. Wegener. Ms. Miljour kept a constant vigil over the feature excavations and field paperwork, ensuring consistent and quality work during all stages of fieldwork. Ms. Karry Blake also provided assistance to the field team from SRI's Tucson office. Ms. Miljour and Ms. Natoli also had the support of several assistant crew chiefs over the course of fieldwork, including Mr. Charest, Ms. Daughtrey, Ms. Lauren Jelinek, Ms. Dorothy Ohman, Mr. Donovan Quam, Ms. South, and Ms. Meaghan Trowbridge. The efforts of these assistant crew chiefs were vital to the field effort; they assigned provenience numbers and supervised the feature excavations.

The individuals who labored through the heat and cold of the Sonoran Desert, as well as under the ever-present roar of F-16 Fighting Falcon jet engines, are particularly deserving of praise for doing such an excellent job during the field effort. As the challenging pace and schedule of the Luke Solar project evolved, the crew responded with the utmost diligence. They include Ms. Shannon Acothley, Mr. Franco Boggle, Mr. Blayne Brown, Mr. Tanachy Bruhns, Mr. Peter Byler, Dr. Janet Griffitts, Mr. Nicholas Hlatky, Dr. Jeffrey Homburg, Mr. Brian Medchill, Mr. Brandon McIntosh, Mr. Geoff Morley, Ms. Ashley Morton, Ms. Bonnie Regenhardt, Mr. Justin Rego, Ms. Rachelle Robinson, Mr. Robert "Reuven" Sinensky, Mr. George Tinseth, Mr. David Unruh, Mr. William A. White III, and Mr. William G. White. During the second phase of data recovery, several Aerostar crew members joined the effort, including Mr. Christopher Ferguson, Mr. Patrick McDermott, Ms. Kathy Mowrer, Mr. Jonathan Paklaian, and Mr. William Turpin, as well as Aerostar's technical representative in the field, Ms. Marilyn Hess. Mr. Jason Windingstad, SRI's geomorphologist, spent many weeks investigating the site soils and stratigraphy. The geologic model developed by Mr. Windingstad is one of the most important contributions to this project and helped place nearly 3,000 features into chronologic groups. Mr. Windingstad was aided in this effort by Dr. Homburg, Dr. Ballenger, and Dr. Stacey Lengyel. Archaeomagnetic samples were collected in the field by Mr. Charest, Ms. Miljour, and Ms. Ohman, under the guidance of Dr. Lengyel. Mr. Scott Thompson, head of SRI's Historic Program, conducted archival research for the historical component of the project, including Rancho La Loma Well, and Dr. Karen Swope analyzed the Historical period materials from the project sites.

Over the course of the long field effort, numerous individuals visited the site and provided both labor and their expertise in southwestern archaeology. These individuals include Dr. Karen Adams, Dr. Richard Ciolek-Torello, Dr. John Douglass, Dr. David Doyel, Dr. William Graves, Dr. Donn Grenda, Dr. Bruce Huckell, Dr. Edgar Huber, Dr. Eric Klucas, Dr. Jonathan Mabry, Ms. Adrianne Rankin, Dr. Seetha Reddy, Ms. Susan Smith, and Dr. Bradley Vierra. The insights and analyses provided by those in this impressive list of experts have greatly increased our understanding of this important project. In particular, the authors would like to thank Dr. Huckell, Dr. Mabry, and Mr. Ben Resnick who served as the project peer review panel. Their comments for this

volume were very beneficial and much appreciated. Dr. Ciolek-Torello, SRI's Research Director, also provided an internal review of the first draft of this volume and offered many helpful comments.

The project maps and cartographic data were generated by Ms. Z. Nahide Aydin, Dr. Stephen McElroy, Mr. Daniel Perez, Ms. Rita Sulkosky, Ms. Meredith Wismer-Lanoë, and Mr. Atticus Zavelle. Mr. Jim Lofaro, Mr. Carey Tilden, and Mr. James Bayer created and updated SRI's intricate database, responding to the ever-changing demands of analysts, authors, and curation staff.

Many individuals were involved with laboratory processing and initial curation preparation. These individuals included Ms. Jody Holmes, Ms. Olivia Charest, Mr. Hlatky, Ms. Ohman, Ms. Erica Young, and Aerostar laboratory technicians Ms. Rachel Hessick and Ms. Ginger Thompson. Special thanks go to Ms. Holmes for obtaining the necessary permits, supervising the laboratory and curation effort, and negotiating the curation process with LAFB.

Ms. Maria Molina coordinated all the production efforts for the HPTP and the preliminary reports, as well as this volume. Ms. Molina was ably assisted by Mr. John Cafiero. Ms. Jacquelyn Dominguez, Mr. Andrew Saiz, Mr. Luke Wisner, and Ms. Peg Robbins produced many of the excellent report illustrations, formatted the digital photographs, and scanned the original field maps. Ms. Beth Bishop and Mr. Grant Klein edited the draft version of this volume. Mr. Jason Pitts, Ms. Linda Wooden, and Ms. KeAndra Begay assisted with the layout of the text and tables. Ms. April Moles, Ms. Cory McKean, and Ms. Sandra Lindblad also provided vital administrative assistance for the project.

Ms. Janet Grenda and Ms. Nicole Torstvet provided administrative support during the course of this project. They assisted the principal investigator in preparing budgets for each phase of the work and prepared timely and accurate financial statements to help us manage the project. Ms. Trish Craig and Ms. Kelly Davern in SRI's Human Resources department also greatly contributed to the success of the project and the well-being of SRI's personnel.

Finally, we extend our sincere appreciation to all those associated with this project, and we apologize to any that we may have inadvertently omitted.

CHAPTER 1

Introduction

John D. Hall and Robert M. Wegener

In an effort to increase renewable-energy production on military installations, the Energy Policy Act of 2005 requires federal agencies to reduce nonrenewable-energy consumption in their facilities by 2 percent every year, up to 20 percent by 2015 (Energy Policy Act of 2005). Strengthening this act, a 2007 congressional mandate (Federal Register 2007) stipulates that federal agencies must improve energy efficiency, reduce greenhouse gases, and develop renewable-energy sources. Similarly, in 2007, the Arizona Corporation Commission set forth the Renewable Energy Standard requiring that 15 percent of Arizona utilities come from renewable sources by 2025 (Arizona Corporation Commission 2007). To comply with these federal and state mandates, Luke Air Force Base (LAFB), in partnership with Arizona Public Service Company, plans to construct a 17-megawatt solar-power array on an undeveloped portion of the base (Figure 1).

LAFB is located in the western Phoenix Basin, surrounded by the town of Glendale, Arizona. The LAFB Solar-Power Array Archaeological Data Recovery Project (Luke Solar project) area of potential effects (APE) is a 107-acre parcel located south of Super Sabre Street and southeast of the LAFB flight line. The APE is divided by Strike Eagle Street; the 42-acre portion north of Strike Eagle Street is designated Area A, and the 65-acre portion south of Strike Eagle Street is designated Area B (see Figure 1). Statistical Research, Inc. (SRI), was contracted in November 2010 to conduct the archaeological mitigation for the Luke Solar project. The solar array will be constructed on lands that contain Native American archaeological sites, and these sites have been determined eligible for listing in the National Register of Historic Places (NRHP), under Criterion d, by the Air Force. To comply with the National Environmental Policy Act of 1969 and Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), the Air Force must mitigate, or lessen, any impacts that the solar-array project will have on any NRHP-eligible archaeological or historical sites that are in the project area. These two volumes present the detailed descriptions and analyses of archaeological features and material remains encountered during the mitigation of historic properties within the APE, which includes the entire 107-acre project area planned for the solar array (see below).

Regulatory Authority

LAFB is a facility of the U.S. Department of the Air Force located in Glendale, Arizona, and as the lead federal agency, LAFB determined that the proposed Luke Solar project is an undertaking that may have an adverse effect on seven historic properties (AZ T:7:419 [ASM], AZ T:7:420 [ASM], AZ T:7:421 [ASM], AZ T:7:422 [ASM], AZ T:7:423 [ASM], AZ T:7:424 [ASM], and AZ T:7:68 [ASM]). LAFB determined these seven archaeological sites eligible for the NRHP in consultation with the Arizona State Historic Preservation Office (SHPO), pursuant to regulations of Title 36, Part 800, of the *Code of Federal Regulations* (36 CFR 800) implementing Section 106 of the NHPA (Title 16, Section 470f, of the U.S. Code [16 USC 470f]).

LAFB and the Arizona SHPO entered into a memorandum of agreement (MOA) whereby the Arizona SHPO fulfilled its role of advising and assisting federal agencies in carrying out Section 106 responsibilities as authorized under the following statutes: Sections 101 and 106 of the NHPA, 16 USC 470f, and pursuant to 36 CFR 800 regulations implementing Section 106, at 36 CFR 106.2(c)(1)(i) and 800.6(b).

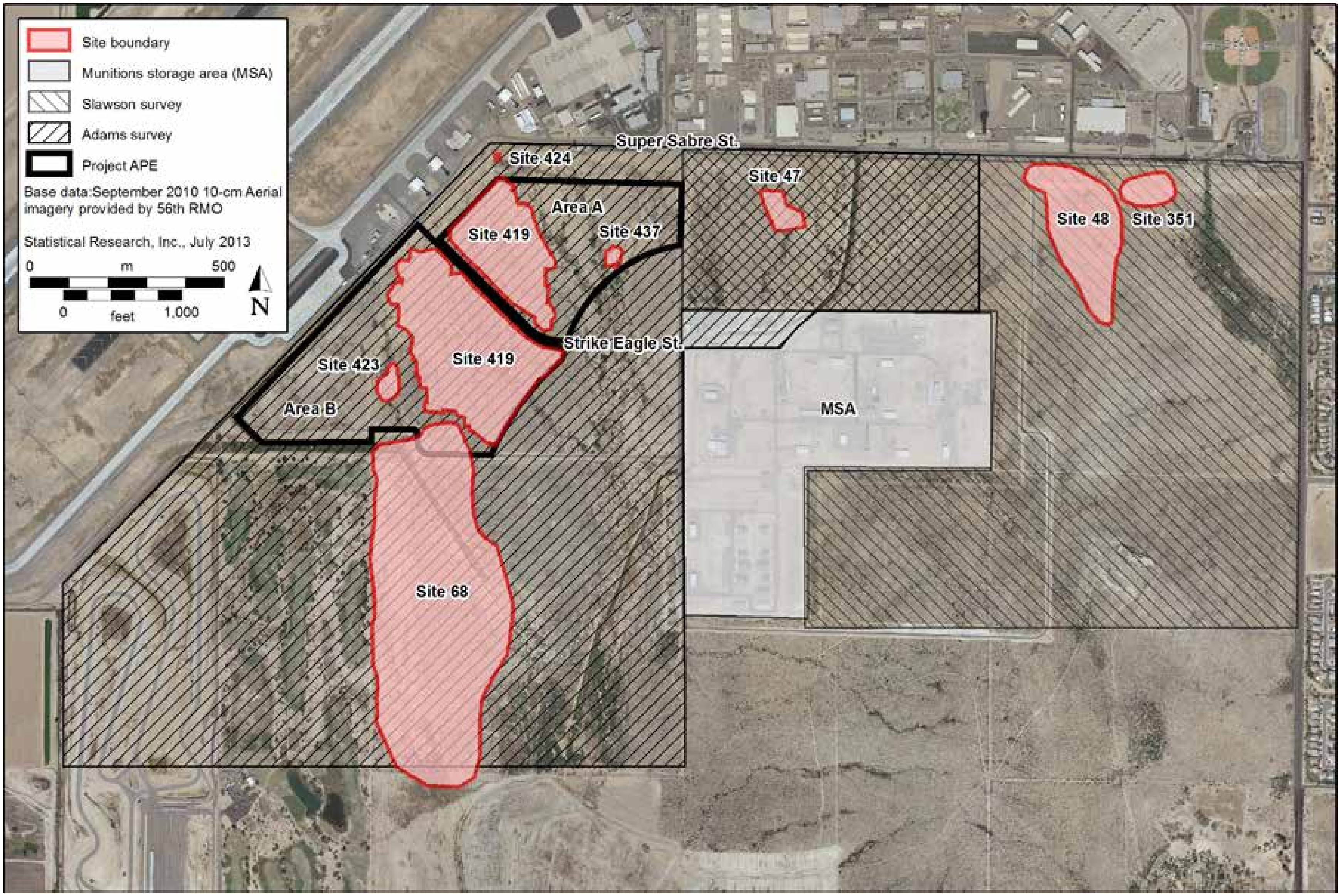

Figure 1. Overview map of the Luke Solar APE, the MSA, previously recorded sites (Sites 47, 48, 68, 351, and 424), and newly recorded site boundaries (Sites 419, 423, and 437).

The APE is considered to be the 107-acre project area—located within portions of Township 2 North, Range 1 West, in the S 1/2 of Sections 8 and 9 (Gila and Salt River Baseline and Meridian)—as well as the footprint of a proposed new waterline and any other peripheral facilities, such as electrical lines, that may be constructed in connection with the facility.

As part of establishing the MOA, LAFB consulted with the Ak-Chin Indian Community, the Cocopah Indian Tribe, the Colorado River Indian Tribes, the Fort McDowell Yavapai Nation, the Fort Mohave Indian Tribe, the Fort Yuma Quechan Tribe, the Gila River Indian Community, the Hopi Tribe, the Hualapai Tribe, the Kaibab Band of Paiute Indians, the Salt River Pima-Maricopa Indian Community, the San Carlos Apache Tribe, the Tohono O'odham Nation, the Yavapai-Apache Nation, the Yavapai-Prescott Indian Tribe, and the Pueblo of Zuni, for whom the above-listed historic properties may have religious and/or cultural significance. Each of the tribes was invited to sign the MOA as a concurring party. LAFB also consulted with officials for the City of Glendale, Arizona (a Certified Local Government), regarding the effects of the proposed undertaking and invited them to sign the MOA as a concurring party. In accordance with 36 CFR 800.6(a)(1), LAFB notified the Advisory Council on Historic Preservation (ACHP) of its adverse-effect determination with specified documentation, and the ACHP chose not to participate in the consultation pursuant to 36 CFR 800.6(a)(1)(iii).

Stipulations in the MOA included the preparation of a draft and final Historic Properties Treatment Plan (HPTP) submitted to all consulting parties. Mitigation of adverse effects caused by the undertaking was conducted in accordance with the final HPTP (Hall et al. 2011). LAFB also ensured that its obligations were fulfilled in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001 et seq.) and 43 CFR 10. The specific process for the appropriate treatment of any discovered human remains, associated funerary remains, unassociated remains, sacred objects, or objects of cultural patrimony were established in a project NAGPRA Plan of Action pursuant to the implementing regulations as set forth in 43 CFR 10 (specifically 43 CFR 10.5[e]), the requirements of the Archaeological Resources Protection Act (16 USC 470 et seq.) and its implementing regulations (32 CFR 229), and in accordance with the guidance provided in Air Force Instruction 32-7065. The project NAGPRA Plan of Action required LAFB and its contractors to follow the treatment, care, and handling guidelines presented in the Treatment of Human Remains section of the HPTP (Hall et al. 2011:53).

Project Summary

Located immediately east of the APE is the Munitions Storage Area (MSA) for LAFB (see Figure 1). In October 2003, SRI completed a 100 percent survey of the MSA project area, which included the 275-acre undeveloped parcel between the MSA and the LAFB flight line. The survey was conducted to acquire new information on the cultural resources within the entire parcel to provide maximum flexibility for future development on LAFB (Tagg et al. 2007:1). The 2003 survey identified seven new archaeological sites: Luke 03A-01, Luke 03A-02, Luke 03A-03, Luke 03A-04, Luke 03A-05, Luke 03A-06, and Luke 03A-08 (Tagg 2008; Tagg et al. 2007). The project area had been previously surveyed by Adams (1991) and Slawson and Maldonado (1990), and Adams (1991) had identified a single site, AZ T:7:68 (ASM). With the exception of its extreme-northern portion, AZ T:7:68 (ASM) is located south of the current Luke Solar project APE (see Figure 1). Additional archaeological sites were identified to the east of the APE, along Super Sabre Street: AZ T:7:47 (ASM) and AZ T:7:48 (ASM) (Slawson and Maldonado 1990) and AZ T:7:351 (ASM) (Wright 2005). A more detailed discussion of these sites is presented in Chapter 2.

In June 2005, SRI returned to the MSA project area to complete archaeological testing for a proposed MSA road (Tagg 2007) that would connect the MSA to the LAFB flight line. The road was later named Strike Eagle Street, which traverses the Luke Solar project area. SRI personnel reevaluated the surface expressions of Luke 03A-03, Luke 03A-05, and Luke 03A-08 and, at the same time, mapped all surface features, artifact concentrations, diagnostic artifacts, and areas of disturbance and excavated approximately 250 m of backhoe trenches along the proposed alignment of the MSA road (Tagg 2007). No buried cultural features were identified in the backhoe trenches. Results of the MSA-road testing (Tagg 2007) and earlier investigations (Slawson and Maldonado 1990; Tagg 2008; Tagg et al. 2007) established that sites in the current project area contained primarily Hohokam components, based on the presence of red-on-buff ceramics, core-reduction debris, and milling equipment on the surface of sites. Adams (1991:4), on the other hand, indicated the possibility of an Archaic period occupation in the current project area, based on the ratio of flaked stone artifacts to ceramic surface artifacts and the presence of a few broken Archaic period–style projectile points.

In September 2010, SRI, in consultation with LAFB and the Arizona SHPO, obtained Arizona State Museum (ASM) site numbers for all the archaeological sites within the current APE that had been previously identified using the "Luke 03A" prefix (Table 1). These sites are AZ T:7:419 (ASM), AZ T:7:420 (ASM), AZ T:7:421 (ASM), AZ T:7:422 (ASM), and AZ T:7:423 (ASM). Based on the results of SRI's archaeological testing (discussed below), Sites 419, 420, 421, and 422 were combined into one large prehistoric site and given the combined designation of "AZ T:7:419 (ASM)" (Hall et al. 2011). This site-combination process will be explained and discussed further in Chapter 4. Another new ASM site number, AZ T:7:424 (ASM), was assigned to a Historical period well and water-conveyance system associated with the Rancho La Loma residence, and the site was named Rancho La Loma Well. The Historical period La Loma Well is located outside the Luke Solar project area (see Thompson 2010), but portions of the water-conveyance system associated with the well traverse the project APE.

In the remainder of this volume and in Volume 2, AZ T:7:424 (ASM) will be referred to as Rancho La Loma Well, and other site numbers will most often be abbreviated using only the final set of digits of the ASM site designations. For example, AZ T:7:68 (ASM) is referred to hereinafter as Site 68.

Between November 3 and December 2, 2010, SRI conducted Phase 1 archaeological investigations in the Luke Solar project area. The Phase 1 investigations included the survey and reevaluation of each site and its boundary, the identification of all surface features, and the location, mapping, and collection of all surface artifacts at the six archaeological sites in the project APE. Following the surface-artifact collection, 3,180 m of backhoe trenches were excavated, in total, among the six archaeological sites. A limited amount of mechanical stripping was also conducted at Sites 419, 421, and 422, totaling about 2 acres. Additionally, Rancho La Loma Well was documented through archival research and field recordation.

An additional intersite-testing program for the areas between previously defined archaeological site boundaries within the project APE was conducted between May 23 and June 9, 2011 (Hall and Wegener 2011). This intersite testing consisted of an additional 83 backhoe trenches distributed throughout the APE. A new archaeological site was identified as a result of the intersite trenching: AZ T:7:437 (ASM), located across a small drainage to the east of Site 419 (see Figure 1).

On September 19, 2011, SRI began Phase 2 data recovery on the Luke Solar project. The data recovery phase consisted of mechanical stripping and intensive feature excavation. On February 9, 2012, the project was temporarily suspended because of the expiration of the contract with LAFB. SRI resumed data recovery efforts on November 5, 2012, as a subconsultant to Aerostar Environmental Services, Inc. (Aerostar), and that work concluded on April 25, 2013. At the conclusion of the Phase 2 data recovery, SRI successfully completed the field investigations of Sites 68, 419, 423, 424, and 437. As part of the subsequent analysis and reporting, Site 419 was given the name Falcon Landing.

Table 1. Site-Number Concordance for the Luke Solar Project Mitigation

Luke Site No.	ASM Site No.
Luke 03A-02	AZ T:7:419 (ASM)
Luke 03A-03	AZ T:7:420 (ASM)
Luke 03A-04	AZ T:7:421 (ASM)
Luke 03A-05	AZ T:7:422 (ASM)
Luke 03A-06	AZ T:7:423 (ASM)
La Loma Well	AZ T:7:424 (ASM)

Volume 1 Overview

The following chapters of Volume 1 describe the results of SRI's Phase 1 and 2 investigations of the Luke Solar project. Chapter 2 begins with an introduction to the environmental setting of the project area and surrounding region, including the Agua Fria River and the western Phoenix Basin. Following discussion of the environmental setting, the archaeological context is discussed, presenting the relevant culture history of the Phoenix Basin and surrounding regions, in order to place SRI's results within the proper framework of chronological and cultural contexts. Chapter 2 also provides a thorough description of the previous archaeological investigations in the western Phoenix Basin and the Agua Fria River valley. Finally, Chapter 2 presents the research themes used to investigate the data obtained from fieldwork and analysis. The themes guiding the research for this project are chronology, cultural affiliation, and land use. SRI's goal for the research themes is to present broad questions applicable to understanding the Archaic, Early Ceramic, Hohokam, and Historical period occupation of the project area and how these occupations were situated within the natural and sociocultural environments over time. Contrary to the initial survey results, presented above, the Luke Solar sites mostly predate the Hohokam culture. The results of SRI's testing and data recovery determined that these sites were predominantly occupied during the Middle and Late Archaic period. The size of the Archaic period occupation is unprecedented in the Phoenix Basin, and this project therefore provides a unique research opportunity to study these Archaic period remains.

Chapter 3 is a detailed discussion of the methods used by SRI to conduct the field investigations and investigate the information obtained during data recovery. The Luke Solar project was a large and complex undertaking that required the documentation of thousands of features, the removal of tens of thousands of cubic meters of dirt, and the processing and analysis of tens of thousands of artifacts and samples. In order to successfully complete a project of such magnitude, specific sets of methods had to be explicitly defined and applied to the data recovery efforts as well as the postfield analyses. For example, the different types of cultural features required specific excavation procedures, to collect the maximum amount of information from each archaeological context.

Chapter 4 presents the results of SRI's investigation of Falcon Landing. Falcon Landing originally consisted of only a small prehistoric archaeological site (Site 419). Over the course of SRI's Phase 1 and 2 data recovery efforts, Site 419 enveloped three other small sites (Sites 420, 421, and 422), becoming a monumental, 46-acre, multicomponent site known as Falcon Landing (Pocket Maps 1 and 2). As a result, the majority of the archaeological investigations for the Luke Solar project were focused on Falcon Landing. The information presented in Chapter 4 represents the results of over 3 years of archaeological investigation and analysis at the site as part of the Luke Solar project.

Chapter 5 presents the results of SRI's investigation of Site 68, located in the southern portion of Area B. Site 68 is a very large prehistoric archaeological site, but only a small, northern portion of the site exists within the APE. Although only a small portion was available for investigation, Site 68 contained a wealth of information.

Chapter 6 is a detailed description of SRI's work at Site 423. Located about 50 m west of Falcon Landing, Site 423 is a small site with three buried prehistoric archaeological features. The surface of Site 423 also contained numerous flaked stone, ground stone, and ceramic artifacts. Though limited, the results of SRI's investigation at Site 423 are part of a larger picture of settlement and subsistence in the Luke Solar project area.

Chapter 7 is a detailed description of SRI's work at Site 437. Located about 130 m east of Falcon Landing, across a small drainage, Site 437 is a small cluster of buried prehistoric features. One of the features is the oldest radiocarbon-dated feature in the Luke Solar project area, dating to the Sulphur Spring phase of the Early Archaic period (ca. 7040–6690 cal B.C). Site 437 was identified during SRI's intersite-trenching program.

Chapter 8 presents the results of SRI's investigations at Site 424, the Historical period Rancho La Loma Well. Rancho La Loma Well is located about 50 m north of the northern limits of the APE, but the associated water-conveyance system consists of a buried waterline, a nonoperational utility line, and a ditch that together traverse the APE northwest to southeast. Chapter 8 presents SRI's archival research of the Historical period well and a physical description of the well and the associated water-conveyance system.

Chapter 9 concludes Volume 1 by summarizing the results of SRI's investigations in the Luke Solar project area. Following the summary of results, Chapter 9 offers a prelude to Volume 2, the analytical volume, which presents the synthesis and interpretation of SRI's data, using the research themes mentioned above and discussed in Chapter 2.

As part of conveying information relevant to the archaeological sites described in this report, Appendixes A, B, and C accompany Volume 1 on a DVD. One of the most challenging aspects of the Luke Solar project was the physical scale of the excavations. Because of that scale, it is difficult to adequately portray the entire project area on one map. An interactive portable document format (pdf) file (Appendix A) was created to help aid the reader by presenting the project area map in a digital format. This interactive pdf file is searchable and contains multiple layers that are independently selectable. For example, the layers can be turned on and off according to the reader's preferences.

A step-by-step user's guide for the interactive pdf file is also provided on the accompanying DVD, along with the interactive pdf file, and is presented at the end of this volume as Appendix B.

Another challenge of the Luke Solar project was the enormous number of extramural pits identified and excavated at Falcon Landing (see Chapter 4). Describing each extramural pit individually would be unreasonable. Therefore, a representative sample of extramural pits is described in Chapter 4, and information for the rest of the extramural pits identified at Falcon Landing is presented in a single table in Appendix C also on DVD.

A number of Historical period artifacts were present on the modern ground surface of Site 68 and Falcon Landing. These artifacts were collected during Phase 1 of the Luke Solar project. The information derived from detailed analyses of these artifacts is presented in Appendix D.

Finally, as a part of SRI's documentation of Rancho La Loma Well, a State of Arizona Historic Property Inventory Form has been completed and is made available in this report, as Appendix E.

CHAPTER 2

Research Context

John D. Hall, Jason D. Windingstad, Richard Ciolek-Torello, Scott Thompson, Jesse A. M. Ballenger, Robert M. Wegener, and John G. Douglass

In this chapter, the environmental and archaeological contexts for the area surrounding the Luke Solar project are described. These discussions provide the background information that was required to frame our investigations and develop our research design. The research design that guided SRI's archaeological investigations for the Luke Solar project is presented at the end of this chapter. The project background and the research design were originally presented in Phase 1 HPTP (Hall et al. 2010), the intersite trenching plan addendum (Hall and Wegener 2011), and the Phase 2 HPTP (Hall et al. 2011). Some of the information in this chapter was adapted from these reports. The significant Archaic period occupation identified during Phase 1 testing necessitated a substantial revision of the research themes presented in the Phase 2 HPTP. The Archaic period occupation in the project sites was first evident from the presence of Archaic-style projectile points. Radiocarbon dates obtained during Phase 1 confirmed the presence of buried Middle and Late Archaic period features (see Chapter 4, this volume). The number of buried Archaic period features in the Luke Solar project area is unparalleled in the Phoenix Basin. The research themes presented in Hall et al. (2011) were adjusted accordingly to emphasize the nature and importance of these Archaic materials.

Environmental Setting

LAFB is situated on a relatively flat alluvial plain in the western portion of the Phoenix Basin (Figure 2). The Phoenix Basin is defined as a large area within the Basin and Range Province in south-central Arizona and consists of a series of topographical basins loosely defined by the McDowell, Hieroglyphic, New River, Mazatzal, Superstition, and Pinal Mountains to the north and east; the Sierra Estrella and White Tank Mountains to the west; and the Santan and Sacaton Mountains to the south (Péwé 1987). The Phoenix Basin is also defined by the Gila River drainage, which flows generally east–west through the basin. Several other major drainages empty into the Phoenix Basin, including the Agua Fria, Salt, Santa Cruz, and Verde Rivers, which are all tributaries of the Gila River. The project area lies between the White Tank Mountains to the west and the lower Agua Fria River to the east; it is located on the lower distal piedmont of the White Tank Mountains.

Despite the nondescript nature of the Luke Solar project area (Figure 3), it is situated in an important landscape. The Luke Solar project area is located along a small, unnamed drainage on the lower eastern *bajada* of the White Tank Mountains. The modern Agua Fria River channel is located approximately 5 km (3.3 miles) due east of the project area. The confluence of the Agua Fria and Gila Rivers is approximately 15 km (9.4 miles) south. The current project area is, therefore, in proximity to the confluence of two important waterways. As reiterated by Garraty, Graves, et al. (2011:43), "watercourses act to concentrate human activity on the landscape. They also structure the movement of people, goods, and ideas and determine, in large part, the logic behind how people settle, use, and create meaning in a cultural landscape." This statement is crucial to understanding the importance of the current project area's location. The Agua Fria River flows north–south, whereas the Gila River flows generally east–west. These drainages undoubtedly served as natural corridors for the movement of people and goods through south-central Arizona. The north–south orientation of the Agua Fria River would have been a convenient corridor for groups traveling between the Basin and Range (Phoenix Basin) and the Transition Zone Provinces and Coconino Plateau to the north.

Figure 2. Overview showing a portion of southern Arizona, including archaeological sites and previous projects mentioned in the text.

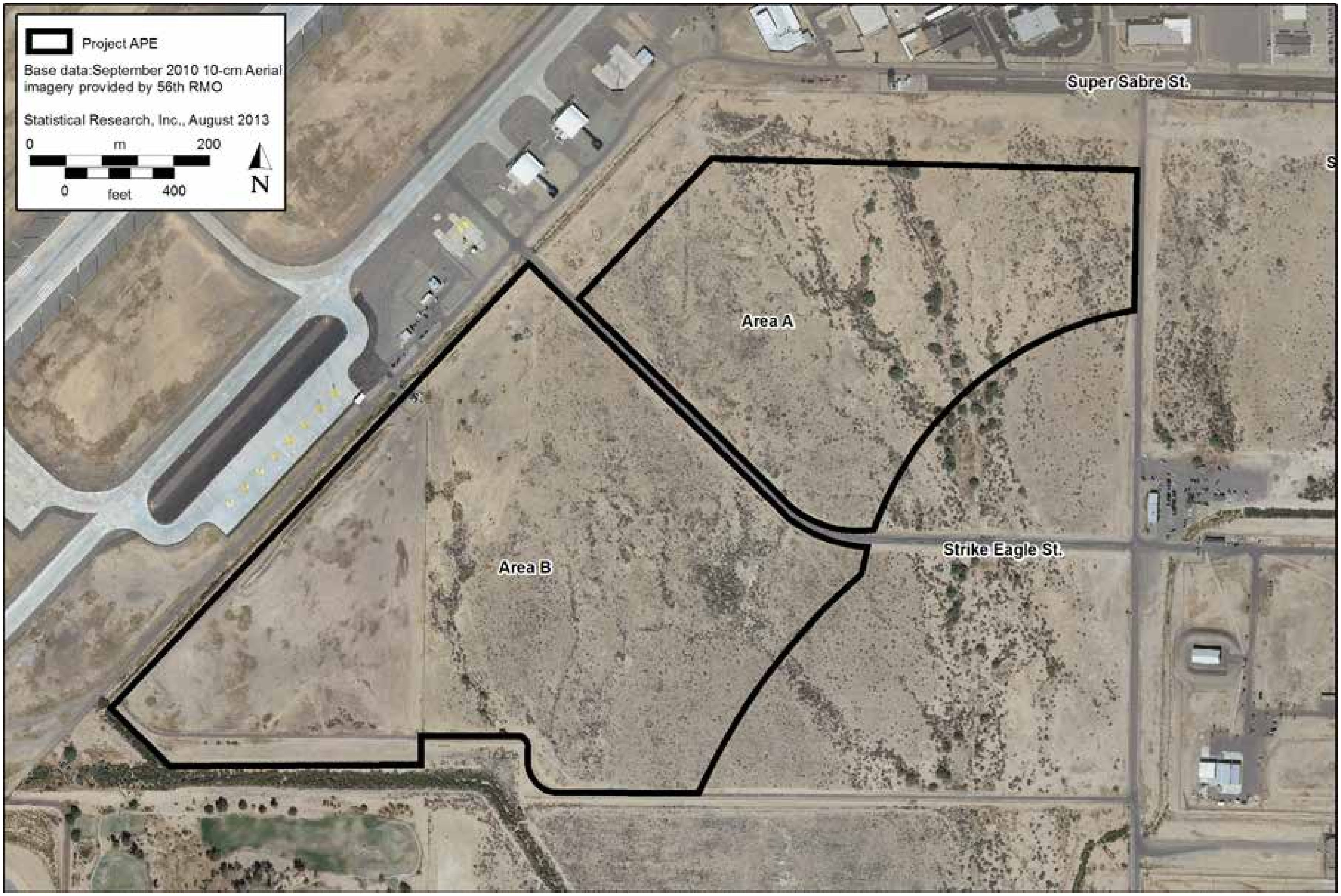

Figure 3. Aerial photograph of the Luke Solar project area prior to excavation. Note the mesquite-lined drainage that runs through Area A and the LAFB flight line in the upper left-hand corner.

The Luke Solar project area also represents an important archaeological manifestation on a lower *bajada* landscape. An Archaic period site of this scale has not been previously identified in the greater Phoenix Basin. According to Roth and Freeman (2008), Middle Archaic period occupation of the lower *bajada* was limited because of a lack of reliable water sources. The geoarchaeological analysis of the Luke Solar project area, however, indicates local hydrological factors created an atypical lower *bajada* environment that would have been quite advantageous for Middle and Late Archaic period groups (see Volume 2, Chapter 2). A key factor was a series of low hills located immediately to the east-southeast of the LAFB that reflect the uplifting of basin fill deposits via the upward plastic flow of salt domes, which are known as the Luke Salt Body (Eaton et al. 1972; Gootee 2013; Peirce 1984). These salt domes elevated the local groundwater table and created a topographic low. Storm water from the upper *bajada* was funneled and concentrated in this area, creating a very low-energy marsh/*cienega* environment with an associated increase in vegetation, biodiversity, and carrying capacity (see Volume 2, Chapter 2).

Agua Fria River

The Agua Fria River is located in the central part of Arizona and has its headwaters near the town of Prescott. It is the nearest significant water source in relation to the project area. The Agua Fria flows generally north–south for its entire course; approximately 145 km (90 miles) from the headwaters south to its confluence with the Gila River (Figure 4). The Agua Fria River drainage basin encompasses about 724,000 ha (1,790,000 acres) or 7,215 km^2 (2,785 square miles) (Megdal et al. 2007). The Agua Fria can be divided into upper and lower sections, based on general topography and physiographic provinces (Huckleberry 1995). The upper or northern section of the Agua Fria is within the Transition Zone Province of Arizona (Titley 1984), also known as the Central Highlands Physiographic Zone (see also Menges and Pearthree 1989) and corresponds to a narrow, rugged drainage basin bounded by the eastern slopes of the Bradshaw Mountains and the western slopes of the Black Hills. This area includes Perry Mesa (now the Agua Fria National Monument) and Black Canyon City. The only human-made impoundment on the Agua Fria River is Lake Pleasant, a reservoir located along the southeastern end of the Hieroglyphic Mountains. It is at this location where the Agua Fria River flows out of the rugged Transition Zone Province into its southern reach through the broad, flat Basin and Range Province (Morrison 1985), specifically the Phoenix Basin. The portion of the Agua Fria near Lake Pleasant is associated with the Arizona Upland biotic community, eventually reaching lower elevations associated with the Lower Colorado Subdivision of the Sonoran Desert. The southern portion of the Agua Fria is characterized by a much wider valley and braided stream channel and includes the western part of the Phoenix metropolitan area, as well as the New River and Skunk Creek drainages to the north and northeast. The confluence of the Agua Fria and New River drainages is about 7.3 km (4.5 miles) to the east-southeast of the project area. The Agua Fria River eventually flows into the Gila River, immediately north of the Sierra Estrella Mountains and about 5 km (3 miles) west of the confluence of the Salt and Gila Rivers: two of the largest drainages in Arizona. The Gila River watershed, in particular, drains approximately 155,400 km^2 (60,000 square miles), primarily in Arizona (Kammerer 1990), and eventually flows into the Colorado River in the southwestern corner of Arizona. The headwaters of the Gila River are located in western New Mexico, with a small portion of the watershed extending into northern Mexico.

Huckleberry (1995:11) has defined a sequence of one Holocene and six Pleistocene terraces above the modern Agua Fria channel in the Phoenix Basin. These terraces range in age from about 10,000 years old to over 1,000,000 years old. Huckleberry speculated that the formation of the Agua Fria terraces are the result of long-term climatic fluctuations associated with glacial to interglacial transitions over the course of the last 2,000,000 years.

A study by Langer et al. (2010) investigated the gravel deposits in the modern stream channel of the lower Agua Fria River using channel deposit exposures in open gravel-mining pits. Langer et al. (2010) identified three macroalluvial deposits (upper, middle, and lower). These gravel deposits represent an effectively inexhaustible supply of raw lithic material suitable for the production of flaked and ground stone implements. The upper deposit corresponds to the modern stream channel. The middle deposit is associated

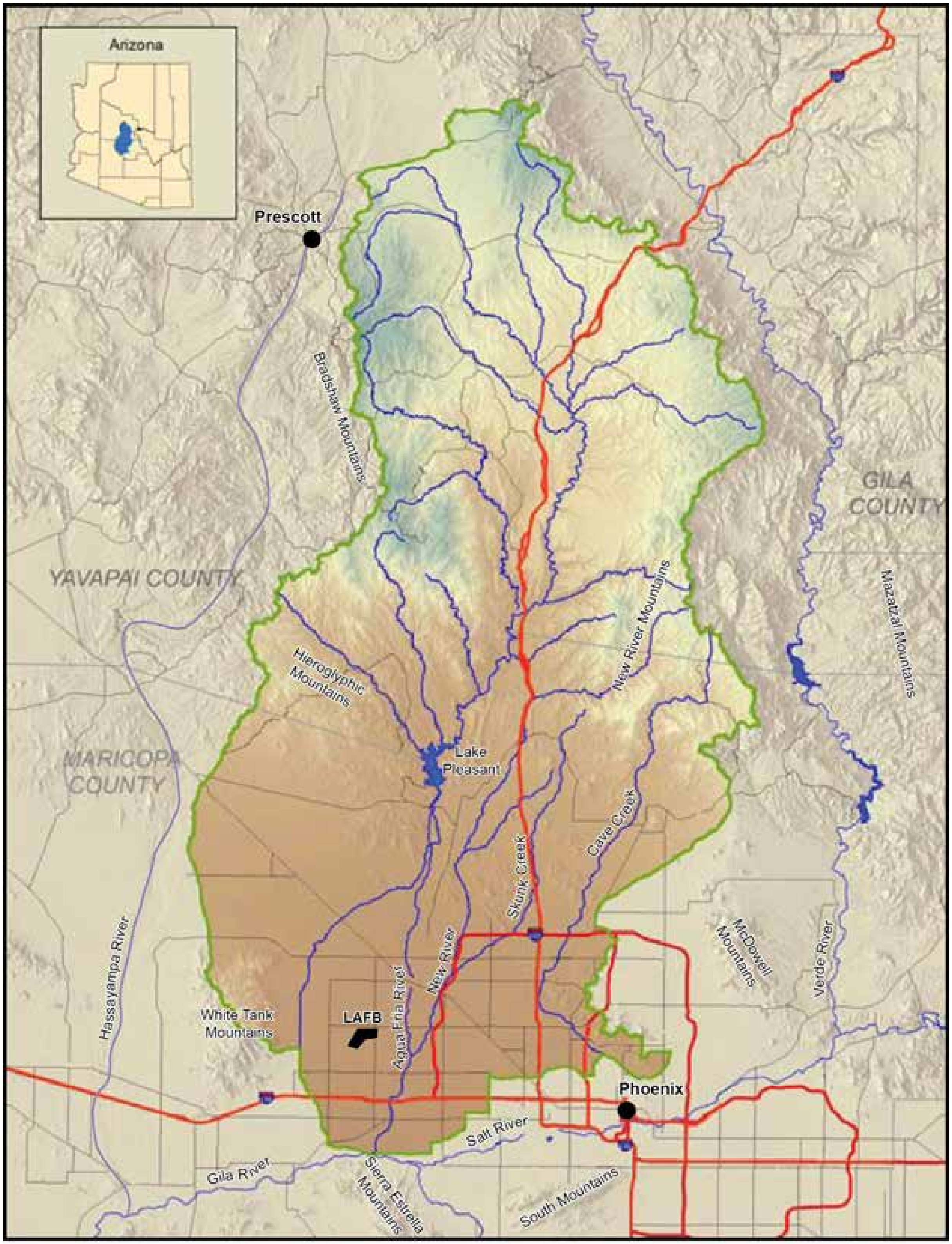

Figure 4. The Agua Fria Drainage Basin, adapted from Megdal et al. (2007).

Table 2. Lithology of Gravels from the Agua Fria River

Lithologic Unit	Percent[a]		
	Upper Alluvial Deposit	Middle Alluvial Deposit	Lower Alluvial Deposit
	Precambrian and Cretaceous Plutonic Rocks		
Crazy Basin granite and pegmatites (combined)	25	25	27
New River Aplite	3	4	7
Gabbro	4	5	3
Subtotal	32	34	37
	Precambrian Metamorphic Rocks		
New River metarhyolite	9	9	10
Other metamorphic rocks	24	22	23
Subtotal	33	31	33
	Tertiary Volcanic and Sedimentary Rocks		
Basalt	2	3	6
Tertiary felsic volcanic and sedimentary rocks	31	33	24
Subtotal	33	36	30

Note: Adapted from Langer et al. (2010:Table 1).

[a] Because of rounding, some column totals may not equal 100 percent.

with Holocene alluvium, less than 10,000 years in age, and the lower unit is associated with Pleistocene stream terrace gravels, believed to be 10,000–200,000 years in age (see also Huckleberry 1995). Langer et al. (2010:28) collected over 455 kg (1,000 pounds) of gravel at six select locations along the lower Agua Fria River. The gravel samples were analyzed and placed into coarse lithologic categories (Table 2), such as Precambrian and Cretaceous plutonic and metamorphic rocks or Tertiary volcanic and sedimentary rocks. More-specific Precambrian and Cretaceous categories included Crazy Basin granite, New River Aplite, gabbro, New River rhyolite, and other metamorphic rocks. Specific Tertiary rocks included basalt and more felsic, or silica-rich, volcanic materials, as well as sedimentary rocks (Langer et al. 2010:28–29). In general, the distribution of gravel materials was even between the three alluvial deposits (upper, middle, and lower), indicating that during the Holocene and latter part of the Pleistocene the three alluvial deposits shared the same general lithology and, in turn, source areas.

Historically, the Agua Fria River was characterized as an intermittent stream (Brown et al. 1981) and was a reliable water source. Modern groundwater pumping and the construction of the Waddell Dam has seriously reduced streamflow in the lower reach of the drainage, and numerous gravel quarries have nearly obliterated the natural topography and ecology of the Agua Fria floodplain in some areas. Despite these modern changes, the Agua Fria River remains an important waterway of central Arizona.

White Tank Mountains

The White Tank Mountains, located approximately 12 km (7.5 miles) to the west represent a prominent landform visible from LAFB (see Figure 2). These mountains are considered one of the landmarks defining the western boundary of the Phoenix Basin (Péwé 1987). Barry Goldwater Peak is the highest point of the range and has an elevation of 1,244 m (4,083 feet) above mean sea level (AMSL). The geology of the White Tank Mountains is dominated by Precambrian (Proterozoic eon) granite and metamorphic rocks, including gneiss, granodiorite, and gabbro. The Precambrian rocks exhibit significant folding and faulting and have numerous Late Cretaceous and early Tertiary granite intrusions and uplifts (Wood et al. 1998). This landform is similar to the surrounding mountainous uplifts of the Phoenix Basin, such as the Sierra Estrella (Melchiorre 1992), as well as the South, Phoenix, McDowell, Camelback, and Santan Mountains (Peterson and Nonini 1979).

The White Tank Mountains support the Paloverde-Cacti-Mixed Scrub series of the Arizona Upland Subdivision (Brown and Lowe 1980; Turner and Brown 1982), which is associated with upland or *bajada* ecosystems of the Sonoran Desert. The Arizona Upland Subdivision is a much more diverse and complex biome than the Lower Colorado Subdivision largely because of the increase in effective moisture associated with higher elevations. In relation to LAFB, the White Tank Mountains is the closest Paloverde-Cacti-Mixed Scrub community. A large portion of the White Tank Mountains is designated as the White Tank Mountain Regional Park. Administrated by Maricopa County, the park incorporates approximately 30,000 acres, most of which is a wilderness area and closed to vehicular traffic. As a result, a large area of the White Tank Mountains is protected and sustains a rich diversity of Sonoran Desert plant and animal species.

White Tank Mountains Piedmont

The distal *bajada* of the White Tank Mountains is characterized by a young, low-gradient, southeast-sloping surface with very little topographic relief. Similar to most externally drained tectonically stable piedmont systems in the Basin and Range Province, young alluvial surfaces become more extensive on the distal White Tank *bajada,* where active or recently active alluvial fans begin to merge with the main axial drainage. Conversely, relict alluvial fans dating to the Pleistocene and late Tertiary generally increase in spatial extent on the medial and distal piedmont, where they form topographically elevated surfaces with incised dendritic drainage networks (Field and Pearthree 1991). This landform sequence is indicative of a tectonically stable basin that has experienced basinwide erosion throughout the late Quaternary and is a common landscape setting across most southern Arizona piedmonts (Bull 1984).

Although this landform sequence holds true for most of the eastern White Tank Mountain piedmont, near LAFB, relict alluvial surfaces are conspicuously present on the distal *bajada* at or very near the modern surface. A series of low, isolated hills are located west of the Agua Fria River and immediately east-southeast of LAFB. These hills are believed to reflect the doming of local alluvial deposits by the upward plastic flow of the Luke Salt Body, an extensive deposit of pure rock salt estimated to be 15 km (9 miles) long, 10 km (6 miles) wide, and extending from 270 m (880 feet) below the surface at the Morton Salt facility to a maximum depth of 4,400 m (14,500 feet) (Eaton et al. 1972; Gootee 2013; Rauzi 2002). The uplifted strata below and adjacent to the salt domes has played a critical role in the maintenance of elevated water tables and the funneling of surface runoff into the Luke Solar project area during discrete periods of the Holocene (see Volume 2, Chapter 2). It is the presence of this surface and/or near-surface water and the plant communities this water supported that likely attracted Middle and Late Archaic period groups to the Luke Solar project area as they conducted their seasonal rounds in the Sonoran Desert.

Climate

In general, the Sonoran desert receives 2.5–38 cm (1–15 inches) of rainfall per year (Sellers and Hill 1974; Turner and Brown 1982:Tables 24 and 27). For the City of Phoenix, precipitation records extend back to 1949. Since then, Phoenix has had, on average, annual precipitation of 19.13 cm (7.53 inches). Extremes for annual Phoenix rainfall include a high of 38.68 cm (15.23 inches) in 1978 and a low of 7.16 cm (2.82 inches) in 1956 (data from Western Regional Climate Center [WRCC] Climatological Data Summaries, available online at http://www.wrcc.dri.edu/index.html, accessed May 2, 2012). Precipitation in the Sonoran Desert is generally biannual, with local variations corresponding to altitude and proximity to mountains. During the winter months, usually December and January, winter rains result from migrating low-pressure systems associated with a southeasterly shift in the jet stream. These systems usually bring low-intensity rains that can last for several days. Summer storms are often referred to as monsoons, which consist of strong thunderstorms occurring between June and September. Monsoonal rains develop when hot, continental air rises and creates a vacuum as cooler air from the Pacific coast and the Gulf of Mexico brings moisture. Intense sunshine heats the desert surface, causing hot air to rise in columns called thermals. The moist coastal air expands and rises as it interacts with the thermals, creating the towering cumulus clouds, or thunderheads (Ingram 2000). Torrential downpours are possible during summer monsoons, which can cause flood conditions in usually dry streambeds.

The mean annual temperature for Phoenix is 22.7 C (72.9°F), with an average high of 29.9°C (85.9°F) and an average low of 15.5°C (59.9°F). Temperature extremes in Phoenix include a record of 50°C (122°F) on June 26, 1990, and a record low of –8.3°C (17°F) on January 5, 1950. Phoenix also has an average of 211 clear (cloudless) days per year (data from WRCC Climatological Data Summaries, available online at http://www.wrcc.dri.edu/index.html, accessed May 2, 2012).

Plant and Animal Resources

The current Sonoran Desert plant communities began to develop around the beginning of the Holocene, approximately 8,000–9,000 years ago (Axelrod 1979). As aridity increased during this time, woodland plant species such as juniper (*Juniperus*), oak (*Quercus*), and piñon (*Pinus edulis*) were replaced by desertscrub plants. The transition from woodland to desert occurred throughout the U.S. Southwest and northwest Mexico, creating what is now the Mojave, Chihuahuan, and Sonoran Deserts (Van Devender and Spaulding 1979).

At an elevation of about 325 m (1,066 feet) AMSL, LAFB falls within the Saltbush series of the Lower Colorado Subdivision of the Sonoran Desert (Brown and Lowe 1980; Turner and Brown 1982) (Figure 5). Even 30 years ago, Turner and Brown (1982:Figure 119) noted that few unaltered stands of this Saltbush community remain. Agriculture, grazing, and urban development have transformed much of this flora in the Phoenix Basin. In general, the Saltbush community is characterized by finer-grained sediments than the lower-elevation Creosotebush-White Bursage series (Turner and Brown 1982:194) as a result of frequent sheetwash flooding. These finer-grained sediments tend to increase water retention, therefore promoting higher salinity levels than sediments associated with the Creosotebush community. As its name implies, saltbush (*Atriplex* spp.) is particularly adapted to these saline soils and thrives under these conditions. Also included within this plant community are mesquite (*Prosopis* spp.), paloverde (*Parkinsonia* [*Cercidium*] spp.), Fremont thornbush (also known as wolfberry) (*Lycium fremontii*), arrow-weed (*Pluchea sericea* [*Tessaria sericea*]), Coulter's globemallow (*Sphaeralcea coulteri)*, quail brush (*Atriplex lentiformis*), and goldenbush (*Isocoma* spp.) (Turner and Brown 1982:194–197). Riparian ribbons flanking washes also support cottonwood trees (*Populus fremontii*) and desert willow (*Chilopsis linearis*) (Turner and Brown 1982:190). Currently, the Luke Solar project area contains predominantly saltbush, along with some Fremont thornbush, and the nearby drainages contain mesquite, paloverde, crucifixion thorn (*Canotia holacantha*), desertbroom (*Baccharis sarothroides*), and various weedy annuals.

The Paloverde-Cacti-Mixed Scrub series of the Arizona Upland Biotic Community is located at a slightly higher elevation than LAFB, at about 350–1,000 m (1,150–3,300 feet) AMSL (Turner and Brown 1982:Table 27). The Paloverde-Cacti-Mixed Scrub series includes the paloverde, ironwood (*Olneya tesota*), mesquite, whitethorn acacia (*Vachellia constricta* [*Acacia constricta*]), ocotillo (*Fouquieria splendens*), agave (*Agave* spp.), bursage (*Ambrosia deltoidea*), jojoba (*Simmondsia chinensis*), fairy duster (*Calliandra eriophylla*), and many other perennial plants (Turner and Brown 1982:201–202). The diversity and uniqueness of the Arizona Upland Community is due in large part to cacti. Important cacti include the saguaro (*Carnegiea gigantea*), Engelmann prickly pear (*Opuntia engelmannii*), hedgehog cactus (*Echinocereus* spp.*)*, night-blooming cereus (*Peniocereus greggi*), fishhook pincushion (*Mammillaria grahamii* ssp. *grahamii* [*M. microcarpa*]), and fishhook barrel (*Ferocactus wislizeni*) (Turner and Brown 1982:202). Originally part of the *Opuntia* genus, chollas are now considered a separate genus (*Cylindropuntia*), based on their cylindrical stems (Pinkava 1999). Many species of cholla are present in the Arizona Upland Community, including buckhorn cholla (*C. acanthocarpa*), cane cholla (*C. spinosior*), staghorn cholla (*C. versicolor*), chain fruit cholla (*C. fulgida*), teddy bear cholla (*C. bigelovii*), desert christmas cactus (*C. leptocaulis*), and pencil cholla (*C. arbuscula*) (Turner and Brown 1982:201–202). Currently, no cacti grow within the APE.

The relatively recent transformation of the desert regions in the U.S. Southwest and northwestern Mexico allowed for a similar distribution of animal species throughout these regions (Ivanyi et al. 2000; Siminski

Figure 5. Photograph of Area A (*upper*) and Area B (*lower*) in the Luke Solar project area prior to excavation. Area A photograph shows mesquite trees and the LAFB water tower in background, view to the northeast. Area B photograph shows the White Tank Mountains in the background, view to the west.

2000; Turner and Brown 1982:182). Common birds include, but are not limited to, the mourning dove (*Zenaida macroura*), white-winged dove (*Zenaida asiatica*), Gambel's quail (*Callipepla gambelii* [*Lophortyx gambelii*]), Harris hawk (*Parabuteo unicinctus*), red-tailed hawk (*Buteo jamaicensis*), roadrunner (*Geococcyx* spp.), raven (*Corvus corax*), lesser nighthawk (*Chordeiles acutipennis*), cactus wren (*Campylorhynchus brunneicapillus*), great horned owl (*Bubo virginianus*), gilded flicker (*Colaptes auratus*), pyrrhuloxia (*Cardinalis sinuatus*), phainopepla (*Phainopepla nitens*), house finch (*Carpodacus mexicanus*), and curved-billed thrasher (*Toxostoma curvirostre*) (Turner and Brown 1982:182).

Mammal species are also widespread in the desert regions, the most common including coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), desert bighorn sheep (*Ovis canadensis nelsoni*), Sonoran pronghorn (*Antilocapra americana sonoriensis*), Coues' white-tailed deer (*Odocoileus virginianus couesi*), ringtail (*Bassariscus astutus*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), Mexican woodrat (*Neotoma mexicana*), desert pocket mouse (*Chaetodipus penicillatus*), Merriam's kangaroo rat (*Dipodomys merriami*), round-tailed ground squirrel (*Spermophilus tereticaudus* [*Xerospermophilus tereticaudus*]), and the California leaf-nosed bat (*Macrotus californicus*) (Turner and Brown 1982:182).

Common desert reptiles include the desert tortoise (*Gopherus agassizii*), desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), desert spiny lizard (*Sceloporus magister*), western diamondback rattlesnake (*Crotalus atrox*), Mojave rattlesnake (*Crotalus scutulatus*), king snake (*Lampropeltis* spp.), banded gecko (*Coleonyx* spp.), Gila monster (*Heloderma suspectum*), western whiptail lizard (*Cnemidophorus tigris* [*Aspidoscelis tigris*]), and many, many more. Common desert amphibians include Couch's spadefoot (*Scaphiopus couchii*), and the Sonoran desert toad (*Incilius alvarius* [*Bufo alvarius*]) (Turner and Brown 1982:182).

Archaeological Context

Central and southern Arizona has historically played an important role in archaeological reconstructions of culture histories and past lifeways in the ancient U.S. Southwest. The prehistory of central Arizona is commonly associated with the Hohokam archaeological culture (Gladwin and Gladwin 1933; Gladwin et al. 1937). The Hohokam are especially known for their elaborate material culture; monumental architecture, such as ball courts and platform mounds; and reliance on canal irrigation along large rivers, particularly the Gila and Salt Rivers in the Phoenix Basin (Crown and Judge 1991; Gumerman 1991; Haury 1976). The Hohokam culture was preceded by Paleoindian and Archaic period cultures. In the following sections, we very briefly outline the culture history of central Arizona, focusing on the Phoenix Basin (Figure 6).

Paleoindian Period (ca. 11,500–9500 B.C.)

Since the discovery of the Naco mammoth kill site in 1951 (Haury 1953), Arizona has played a central role in the study of the Paleoindian period and the arrival of the first humans to the New World. Virtually no evidence of the Paleoindian period tradition has been found in the vicinity of the project area, with most of our knowledge of this period resulting from sites associated with the Clovis culture, along the San Pedro Valley in southeastern Arizona. Sites such as Murray Springs, the Naco site, the Lehner site, and many others have provided an unparalleled look into Paleoindian period lifeways from what is the largest concentration of stratified Clovis sites in the New World (Ballenger 2010; Haynes 2007). Radiocarbon dates from these sites cluster in age around 11,500–11,000 cal B.C. (Haynes 2007). The Clovis culture in southeastern Arizona was apparently a hunting-and-gathering adaptation with an emphasis on big-game procurement. How heavily Paleoindian period groups relied on the hunting of megafauna and the contribution of this hunting to the extinction of these species at the close of the Pleistocene is a matter of continued debate and research

YEAR A.D. B.C.	Period	Phoenix Basin Phase (Dean 1991; Huckell 1996; and Wegener and Ciolek-Torello 2011)	Tucson Basin Phase (O'Mack and Klucas 2004; Sliva 2005)
1900	Historical	Euroamerican	Euroamerican
1800, 1700		Pima/Papago	Protohistoric
1600, 1500	Protohistoric		
1400, 1300	Classic	Civano	Tucson
1200		Soho	Tanque Verde
1100, 1000	Sedentary	Sacaton	Rincon
900	Colonial	Santa Cruz	Rillito
800		Gila Butte	Cañada del Oro
700	Pioneer	Snaketown	Snaketown
600		Sweetwater	Tortolita
500		Estrella	
		Vahki	
400, 300, 200, 100	Early Ceramic	Red Mountain	Agua Caliente
A.D. 0 B.C.	Late Archaic/ Early Agricultural	Cienega	Late Cienega
500			Early Cienega
1000		San Pedro	San Pedro
1500, 2000, 2500, 3000, 3500	Middle Archaic	Chiricahua	Chiricahua
4000, 4500, 5000, 5500, 6000, 6500, 7000, 7500, 8000, 9000	Early Archaic	Sulphur Spring	Sulphur Spring
10,000, 11,000	Paleoindian		

Figure 6. Culture history of southern Arizona.

(see Haynes and Huckell 2007). Interestingly, no Folsom age or later Paleoindian period materials or sites have been identified in southeastern Arizona (Ballenger et al. 2011). This absence of later Paleoindian period materials is intriguing and may reflect a hiatus in the human use and occupation of the area that lasted until the Early Archaic period, perhaps ca. 9500 B.C. (Ballenger and Mabry 2011). The Clovis use and occupation of southeastern Arizona may have been a relatively brief, albeit intensive, phenomenon and may not be related in any historically or socially meaningful ways with subsequent human groups or cultures in the region.

The earliest documented human presence in the area surrounding LAFB is Clovis in age, although evidence of Paleoindian period large-game hunters is rare (Haynes 2011). A reworked, fluted projectile point was recovered at AZ U:5:160 (ASM), located on the western edge of the McDowell Mountains, about 48 km east of LAFB (Leonard 1996:33; Owens 1995:48). Three Clovis points have been documented within an area centered along the Agua Fria and New Rivers, approximately 25–50 km north of LAFB (Crownover 1994; Huckell 1982; North et al. 2005). North et al. (2005:297) suggested that these points were left by Paleoindian period big-game hunters who were following major river corridors as they moved through the Phoenix Basin to more-fertile hunting grounds located to the southeast (see also Haynes 2011).

Archaic Period (ca. 9500 B.C.–ca. A.D. 50)

Post-Pleistocene human adaptations and developments are characterized by the global expansion of foraging populations into highly variable Holocene environments following Pleistocene extinctions and the associated shift in foraging behavior to exploit a broader suite of resources than what had been available to the earlier subsistence economies. This transition is often described in behavioral terms as the "broad spectrum revolution" (Flannery 1969; Stiner 2001), a seminal development in human subsistence and organization characterized by increases in dietary breadth during the Archaic or Mesolithic periods. Archaic period lifeways developed at different tempos and scales, based on local environmental parameters and historical particulars, and generally culminated in the development of food-production strategies, increased sedentism, novel strategies of social organization, and other attributes of cultural complexity. The study of post-Pleistocene adaptive changes therefore concentrates on a common set of questions related to when, where, how, and why human foraging populations began to make the transition from living in small, highly mobile forager groups to living in often large, more socially complex, agricultural communities that mark the American Neolithic Revolution. Several independent zones of agricultural invention appeared almost simultaneously on the planet during the Holocene, during a chronological interval from 9000–1500 B.C. (Kohler et al. 2008). These zones were located in the Near East, East Asia, Sub-Saharan Africa, South America, Mesoamerica, eastern North America, and the U.S. Southwest, where current evidence indicates that aboriginal populations began to incorporate domesticated maize into their economies by 2100 cal B.C. (Merrill et al. 2009).

The American West witnessed significant human adaptive breadth and the development of several broadly defined cultural traditions during the early and middle Holocene, including complex maritime collectors along the Pacific Coast (Erlandson and Colten 1991), lacustrine- and riverine-oriented foragers in the Great Basin and Columbia Plateau (McGuire and Hildebrandt 2005; Prentiss and Kuijt 2004; Simms 2008), desert-adapted hunter/gatherers in the U.S. Southwest (Mabry 1998; Sayles and Antevs 1941), and Plains-oriented hunters in the Trans-Pecos region (Irwin-Williams 1973). Evidence that disparate cultural and adaptive traditions developed along broadly similar themes of regionalization and resource diversification is reminiscent of post-Pleistocene adaptations worldwide, but the individual trajectories of these regional adaptations cannot be so generalized. In some cases, such as the Great Basin and Plains, social organization and subsistence economies appear to have experienced relatively little change during the Holocene, whereas coastal societies show a steady increase in the array of technologies used to exploit increasingly diverse wild foods. It is within this context of global ecological reorganization and regionally distinct diversification that we examine the uniquely situated Archaic period record preserved in the Luke Solar project area.

Generally speaking, as a response to increased aridity and the extinction of Pleistocene megafauna, Archaic period people lived in mobile bands and exploited a wide variety of seasonally available plant and animal resources. After ca. 2000 B.C., cultigens, such as corn and beans, entered Archaic period economies and are associated with increased sedentism and larger populations in the U.S. Southwest (Merrill et al. 2009). Archaic period archaeological manifestations in central Arizona are characterized by the Cochise culture (Sayles 1983; Sayles and Antevs 1941), which has been the focus of numerous investigations of Archaic period lifeways and adaptations in the U.S. Southwest (e.g., Haury 1950, 1983; Irwin-Williams 1979; Sayles 1983; Sayles and Antevs 1941). The majority of archaeological sites attributable to the Cochise culture are found along Whitewater Draw, located in the Sulphur Spring Valley of southeastern Arizona. One of the most important records of Archaic occupation in the U.S. Southwest comes from the stratigraphy of Ventana Cave. Excavated by Emil Haury (1950), Ventana Cave is located almost due south of LAFB at a distance of about 130 km (80 miles). The cave has several distinct deposits containing cultural material. The earliest of these artifact-bearing deposits was the Volcanic Debris layer that was used to define the Ventana Complex (Haury 1950:176–199), believed to be a late-Pleistocene Clovis or Folsom occupation. The Ventana Complex has since been reinterpreted to coincide with the late Paleoindian or Early Archaic period (ca. 10,500–8800 B.C.) (Huckell and Haynes 2003). Overlying the Ventana Complex were the Red Sand layer and a large midden deposit. The Red Sand layer was termed the Ventana-Amargosa I complex and contained several stemmed and leaf-shaped projectile points, likely representing Jay points (Freeman 1999). Above the Red Sand layer was the midden deposit, and this midden was divided into a 'moist' midden beneath a 'dry' midden (Haury 1950:205). Artifacts from the lower moist midden contained diagnostic Middle and Late Archaic projectile points, such as San Jose/Pinto, Chiricahua, Gypsum, and possibly Cortaro points corresponding to the Middle Archaic period, with San Pedro and Cienega points corresponding to the Late Archaic period (Haury 1950:294–301). The dry midden, representing the uppermost deposit as well as the modern surface of the cave, contained Hohokam and historic Tohono O'odham remains.

Three stages have been defined for the Cochise culture (now commonly known as phases): the Sulphur Spring phase, the Chiricahua phase, and the San Pedro phase (Sayles 1983; Waters 1998). A fourth phase, the Cienega phase, was later defined in the Tucson Basin and the San Pedro Valley (Huckell 1995, 1996; Van West and Altschul 2000) and may be applicable to other portions of central Arizona, including the area in which the project sites are located. Huckell (1996) also placed these phases into more-general periods, including the Early, Middle, and Late Archaic periods. For example, Huckell has attributed the Sulphur Spring phase to the Early Archaic period, the Chiricahua phase to the Middle Archaic period, and the San Pedro and Cienega phases to the Late Archaic/Early Agricultural period. The Early Archaic, Middle Archaic, and Late Archaic/Early Agricultural period sequence is used in the following discussions for the sake of consistency among different data sets and the ability to place our inferences about Archaic period adaptations in broader temporal and geographic terms.

Early Archaic Period (ca. 9500–3500 B.C.)

Radiocarbon dates associated with the Early Archaic period range from ca. 10,000 to about 8000 B.P., or about 8050–6050 B.C. (Sayles and Antevs 1941; Waters 1998). Along Whitewater Draw, Early Archaic period materials have consisted of relatively simple grinding or milling tools and relatively few flaked stone tools, although Sayles and Antevs were unable to locate projectile points associated with these deposits. These materials have been often found in secondary contexts (gravel and sand deposits) and appear to have been transported only a short distance (Waters 1998:121). Other Early Archaic period materials have been found in what appear to be eroded floodplain contexts (Waters 1998:121). Diagnostic projectile points for the Early Archaic period have been identified in other areas and included several varieties of stemmed dart points, including Lake Mojave (Campbell et al. 1937) and Jay and Bajada (Irwin-Williams 1973, 1979). As stated above, Haury (1950:Figure 5b) identified several stemmed points from the Red Sand layer of Ventana Cave and designated them Ventana-Amargosa I; these likely date to after 8700 B.P. (Huckell 1996). Four possible Early Archaic period sites containing stemmed points were excavated in the Santa Rita Mountains, but the points were surface or near-surface finds that lacked datable contexts (Huckell 1984).

The dating and interpretation of the Early Archaic period have been the focus of some disagreement among archaeologists over the past several decades. In the 1950s, Sayles defined the Cazador phase (Sayles 1983; Waters 1986:2), which followed the Sulphur Spring phase. Whalen (1971) and Irwin-Williams (1979) called into question the validity of this phase, and it has not been widely accepted (Waters 1986:63; Yost et al. 2001:9). In addition, several researchers (e.g., Haury 1983; Martin and Plog 1973) thought that the Sulphur Spring phase was contemporaneous with the Clovis culture and that sites dating to this period represented Paleoindian period plant-processing locales. The most-recent dating of the phase suggests that this scenario is not valid and that the Sulphur Spring phase is the oldest known (i.e., Early Archaic period) tradition in central Arizona (Waters 1986, 1998; Waters and Woosley 1990). The evidence for the Early Archaic period occupation in the region has demonstrated that the Archaic period adaptation based on hunting, as well as plant gathering and processing, had been firmly in place by the beginning of the Holocene (Waters 1998:133).

An Early Archaic period habitation locus was recently uncovered at AZ T:11:94 (ASM), located along the lowermost Salt River floodplain in the western Phoenix Basin (Graves et al. 2009; Graves et al. 2011) (see Figure 2: Cashion Complex). Two possible pit structures and two extramural pits preserved in a remnant portion of the Blue Point terrace contained charred wood that produced 2s calibrated date ranges of 5210–4940 cal B.C. to 3970–3790 cal B.C. (Graves et al. 2011:Table 1). Considering the established dates for the Early and Middle Archaic periods, as outlined above, the Archaic period occupation of AZ T:11:94 (ASM) coincided with a very poorly understood transition between the Early and Middle Archaic periods. Clearly, more work is needed to better define this period in southern Arizona and the greater U.S. Southwest.

Middle Archaic Period (ca. 3500–1200 B.C.)

The next commonly recognized division of the Archaic period is the Middle Archaic period. The dating of this period has also proven problematic (Waters 1986:63). Whalen (1975) dated the Middle Archaic period from ca. 3500 to 1500 B.C., but Waters (1986:64) stated that radiocarbon dates from the Sulphur Spring Valley all clustered around 3500 B.P. (roughly 1550 B.C.). Regardless of the exact dating of the period, it does appear likely that a significant gap exists between the end of the Early Archaic period and the beginning of the Middle Archaic period, as stated above. The Middle Archaic period materials have consisted of milling stones, pestles, and a variety of unifacial and bifacial tools, including distinctive projectile-point types (Waters 1986:63). Diagnostic Middle Archaic period projectile point styles include the Chiricahua-style point (named for the Chiricahua phase of the Cochise Culture), which has been identified from Ventana Cave (Haury 1950:Figure 58); San Jose/Pinto-style projectile points (Haury 1950:Figure 58; Justice 2002:Figures 17 and 18; Sayles 1983:Figure 9.4); and Cortaro-style points (Gregory 1999a; Roth and Huckell 1992). Examples of all three Middle Archaic period projectile point styles have been recovered from the Luke Solar project area.

From these materials, it would appear that the Middle Archaic period represents a continuation of a similar hunting-and-gathering adaptation that has been reflected in the Early Archaic period record, although the earliest evidence of maize use has been documented at a few Middle Archaic period sites in southern Arizona. In particular, the Middle Archaic period component at Los Pozos, a site on the Santa Cruz River floodplain in the Tucson Basin, has produced a single direct radiocarbon date from a possible maize cupule of 2825–2475 cal B.C. (1σ) (Gregory 1999b:118). Two other direct dates on maize from the Clearwater site in the Tucson Basin cluster around ca. 2100 B.C. (1σ) (Mabry 2006:19.2) and represent some of the oldest directly dated maize in the U.S. Southwest. The Clearwater site also has evidence of canals and fired ceramics from this 2100 B.C. interval (Heidke 2006; Mabry 2006). Following Huckell (1995), the Early Agricultural period denotes the introduction and slow development of agricultural practices in southern Arizona. Based on work at Las Capas in the Tucson Basin, Whittlesey et al. (2010) used the Silverbell interval (ca. 2100–1200 cal B.C.) to describe the earliest part of the Early Agricultural period prior to the San Pedro phase. For the Luke Solar project, agricultural traces are conspicuously absent; however, some features are dated to the 2100–1200 cal B.C. interval (see Volume 2, Chapter 2). As a result, we apply the term late Chiricahua to this time frame, and this should be considered a simple heuristic device allowing the comparison of 3500–2100 and 2100–1200 cal B.C. Chiricahua contexts.

One of the first Middle Archaic sites identified in the Phoenix Basin was the Gila Dunes site (AZ U:15:8 [ASM]) (Fish 1967). The Gila Dunes site is located on the north bank of the Gila River northeast of Florence, Arizona, and is nearly a square mile in size. Surface collection was originally conducted by Frank

Midvale, but the site was later investigated by Paul Fish. Artifacts from the Gila Dunes site indicate a significant number of lithic artifacts, including several diagnostic Pinto/San Jose and Chiricahua projectile points (Fish 1967). The presence of Hohokam ceramics also point to later occupations. Other important work on the Middle Archaic period in southern Arizona includes the Picacho Reservoir Archaic Project (Bayham et al. 1986). According to Bayham and Morris (1986), two distinct occupations are present in the Picacho area: a single component, short-term winter field camp that included San Jose/Pinto points and a long-term summer and fall base camp that included Chiricahua points. This apparent social complexity (based on Middle Archaic period point styles) associated with divergent subsistence and mobility strategies has a great deal of potential for further research (see also Freeman 1999; Roth and Freeman 2008).

Prior to the Luke Solar project, the best evidence of Archaic period occupation in the Phoenix Basin came from the Last Ditch site (AZ U:5:33 [ASM]), which is located in Paradise Valley, along the southern middle–lower *bajada* slope of the McDowell Mountains near Scottsdale (see Figure 2). The Last Ditch site is one of the few known and well-documented Middle and Late Archaic period sites in the Phoenix Basin (Hackbarth 1998, 2001; Phillips et al. 2001; Rogge 2009). Data recovery was conducted at the Last Ditch site on three occasions. Hackbarth (1998) excavated a portion of the West Rawhide locus, located in the southern portion of the site along Mayo Boulevard. Phillips et al. (2001) returned to the site to excavate the Pima Freeway State Route (SR) 101L locus, located in the northern portion of the site along the new SR 101 right-of-way (ROW) alignment. Finally, Rogge (2009) excavated the SR 101L/64th Street locus, located along the intersection of 64th Street and SR 101. Over 200 features were assigned to the Middle Archaic period from the Phillips et al. (2001) and Rogge (2009) investigations. Phillips et al. (2001:3741) documented two Middle Archaic period structures associated with a possible midden, oxidized use surfaces, and 142 thermal pits. Rogge (2009:3146) identified 54 hearths, some without fire-affected rocks (FAR), and 14 charcoal/ash stains. The 2σ radiocarbon dates from the Middle Archaic period components clustered around 2500–1900 cal B.C. (Phillips et al. 2001:58–59) and 2900–2300 cal B.C. (Rogge and Phillips 2009:47–59). The Middle Archaic period inhabitants of the Last Ditch site were primarily engaged in the processing of native-plant resources during the spring and late summer–early fall, as evidenced by the numerous thermal features (hearths) containing thermally altered rock. This site has provided good evidence of a multicomponent middle–lower-*bajada* plant-food processing camp in the Phoenix Basin (Hackbarth 2001).

Late Archaic/Early Agricultural Period (ca. 1200 B.C.–A.D. 50)

The final Archaic period phases are the San Pedro and Cienega phases, which correspond to the Late Archaic/Early Agricultural period. The exact dating of the Late Archaic period is also somewhat problematic. Whalen (1975) placed the San Pedro phase between 1500 B.C. and A.D. 100, but Waters (1986:65) suspected that the date range of the phase may be more restricted than is commonly held. More-recent research at Las Capas and Los Pozos, two sites along the middle Santa Cruz River near Tucson, has placed the San Pedro phase from ca. 1200 to 800 cal B.C. (Gregory 1999b, 2001a; Mabry 2008; Whittlesey et al. 2010). Excavations at Las Capas have revealed an extensive system of gridded irrigation ditches and field plots, suggesting a level of investment in agriculture that was not previously recognized for the Archaic period (Herr 2009). The San Pedro phase seems to represent a significant change from the adaptation reflected in the preceding Early and Middle Archaic periods. Artifact assemblages typically consist of deep basin metates, pestles, manos, and a variety of flaked stone tools, including the distinctive San Pedro–style projectile point type (Sayles and Antevs 1941; Sliva 2005:94–95). The San Pedro phase is also the first from which architectural remains have been found in southern Arizona in substantial numbers. Excavations at the San Pedro phase Milagro site uncovered small, informal houses, large storage pits, roasting pits, shell ornaments, and ceramic figurines (Huckell and Huckell 1984; Huckell et al. 1995).The remains of shallow pit houses and storage pits mark a significant change in material culture and land use compared to earlier Archaic period contexts (Gregory 1999b; Mabry 2008; Sayles 1983; Whittlesey et al. 2010) by indicating increased levels or intensities of sedentism, a reliance on stored resources, and a more intensive use of domesticated plants.

The subsequent Cienega phase (ca. 800 B.C.–A.D. 50) represents an expansion of settlements and a corresponding increased reliance on agriculture (Diehl 2005; Gregory 2001a; Huckell 1995; Mabry 1998, 2005; Sliva 2005). Mabry (2005:Table 1.1) has recently divided the Cienega phase into the Early Cienega (ca. 800–400 B.C.) and Late Cienega (ca. 400 B.C.–A.D. 50) phases. The Cienega phase also represents an elaboration of ground stone items, including stone rings, discs, trays, pendants, and cruciform (Huckell 1995:119). The Cienega-style projectile point type also serves as a hallmark of the Cienega phase (Huckell 1988; Sliva 2005:94–95). Relatively large settlements, such as the Santa Cruz Bend site, were established during this phase in the Tucson Basin (Mabry 1998). In the Santa Cruz Flats north of Tucson, the Coffee Camp site provides evidence of a nonriverine Late Archaic period settlement where agriculture was apparently not the primary focus (Halbirt and Henderson 1993). A large ground stone collection at Coffee Camp also indicates a small-seed milling economy, which correlates with the botanical evidence. The absence of domesticated plants at Coffee Camp has led Huckell (1996:345) to postulate the presence of a persistent Late Archaic period hunting-and-gathering economy located on the fringes of the more-well-watered Tucson Basin. In general, Cienega phase settlements were marked by groups of small houses and human inhumations placed in intramural and extramural pits. The earliest known large, possibly communal, structures have also been identified at Cienega phase sites in the Tucson Basin (Mabry 1998). An untempered, ritual, incipient pottery tradition also emerged at Tucson Basin sites during the Cienega phase (Heidke 1999). In the Phoenix Basin, a small Cienega phase component was identified at the Last Ditch site, with two thermal pits radiocarbon dated to 345–50 cal B.C. (1σ) (Hackbarth 1998:59–60).

Until recent investigations at Finch Camp (AZ U:11:7 [ASM]) (Wegener, Miljour, et al. 2011; Wegener, Heilen, et al. 2011), no substantial Cienega phase settlements were known in or around the Phoenix Basin. Excavations at Finch Camp have revealed a significant Late Archaic/Early Agricultural period occupation along the eastern boundary of the Phoenix Basin, as well as the earliest evidence of utilitarian pottery manufacture in the Phoenix area prior to the Early Ceramic period (Garraty, Heckman, et al. 2011). The Cienega phase component at Finch Camp (ca. 360 cal B.C.–cal A.D. 80) included numerous structures, pits, burials, middens, and ample evidence of utilitarian plain ware pottery (Wegener, Miljour, et al. 2011). Plant remains recovered from features suggest Finch Camp was occupied seasonally, between April and September. Although small amounts of maize were identified at Finch Camp, the inhabitants were engaged primarily in collecting and processing local wild-plant resources, such as cacti and the seeds of small weedy annuals, as well as hunting rabbits, hares, and ungulates (Wegener, Miljour, et al. 2011:226).

Hohokam Culture (ca. A.D. 50–ca. 1450)

Post-Archaic time periods and traditions in central Arizona are often referred to as “Formative,” borrowing language and terminology from mid-twentieth-century cultural-evolutionary frameworks (e.g., Willey and Phillips 1958) to characterize traditions and adaptations with a reliance on domestication, ceramic-container technology, and a basically sedentary settlement strategy. Because of the obvious cultural-evolutionary bias reflected in this usage, we do not apply the term Formative period in this volume.

The Early Ceramic period (ca. A.D. 50–400), also referred to as the Early Formative period (see Deaver and Ciolek-Torello 1995), includes the Red Mountain phase in the Phoenix Basin and the Agua Caliente phase in the Tucson Basin. The Early Ceramic period is associated with an expedient lithic technology and remnant Archaic period bifacial technology and milling assemblage. The well-developed plain ware ceramics contrast with earlier “incipient plain ware” ceramic containers identified in Late Archaic/Early Agricultural contexts by exhibiting greater diversity in vessel shape and more-proficient manufacturing techniques (Deaver and Ciolek-Torrello 1995; Heidke 1999; Whittlesey 2003). Architectural forms are similar to Early Pithouse period Mogollon houses (Anyon and LeBlanc 1980; Ciolek-Torrello 1995, 1998; Huckell 1987; Mabry 2000), with an increase in overall house size from the Late Archaic/Early Agricultural period, the introduction of formal protruding entryways, and subrectangular floor plans. In addition, subsistence seems to have been a mix of agriculture and hunting and gathering, with a continued emphasis on upland resources. Red Mountain phase sites in the Phoenix Basin include Pueblo Patricio (Cable et al. 1985; Hackbarth 2010), La Escuela Cuba (Hackbarth 1992), La Cuenca del Sedimento (Henderson 1989), the Red Mountain site (Morris 1969), and Finch Camp (Wegener, Miljour, et al. 2011). Pueblo Patricio, located in downtown Phoenix, has a large Red Mountain phase component, with features clustering around cal A.D. 220–390, as well as cal A.D. 380–610 (Hackbarth 2010:Table 4.8). The largest single Red Mountain phase settlement identified to date was preserved at Finch Camp, located near the Queen Creek drainage in the western Phoenix Basin. Finch Camp also represents a fairly continuous occupational record of repeated seasonal occupation from the Late Cienega phase through the Red Mountain phase (ca. 370 cal B.C.–cal A.D. 400) (Lengyel 2011:30). Contemporaneous Agua Caliente phase site components in the Tucson Basin include the Houghton Road site (Ciolek-Torrello 1995, 1998), El Arbolito (Huckell 1987), the Dairy site (Altschul and Huber 1995), as well as the Square Hearth and Stone Pipe sites (Mabry 1998).

The Pioneer period, dating to ca. A.D. 400–750, is signaled by the appearance of a widespread change in material culture, particularly ceramics. The beginning of the Pioneer period in the Phoenix Basin is known as the Vahki phase (ca. A.D. 400–550) (Dean 1991). In the Tucson Basin, the Tortolita phase (ca. A.D. 500–700) is used to define this interval. Both the Vahki and Tortolita phases are associated with the appearance of red ware pottery, which has a diversity of vessel shapes (Whittlesey and Ciolek-Torrello 1996). The widespread use of decorated ceramics in the Phoenix Basin appears during the Estrella and Sweetwater phases (ca. A.D. 500–650) (Dean 1991). According to Deaver and Ciolek-Torrello (1995), Snaketown phase ceramics are the horizon markers for the end of the Pioneer period, ca. A.D. 750 (see also Haury 1976). It is in this period that traditional Hohokam culture emerged throughout much of southern Arizona. By the end of the Pioneer period, the Hohokam were well established, in both the Tucson and Phoenix Basins, as a sedentary culture that relied on agriculture. Many of the major villages were located along primary drainages, where their irrigation technology could be applied. The appearance of ball courts, cremation rituals, and a distinctive suite of associated items led many archaeologists to speculate that the Hohokam culture was intrusive from Mesoamerica (Gladwin 1948; Haury 1976). More-recent analysis of the origins of the Hohokam point to an indigenous cultural development from preceding Archaic period peoples (Deaver and Ciolek-Torrello 1995; DiPeso 1979; Whittlesey 1995) who practiced agriculture far earlier than previously thought (Mabry et al. 2008). Other scholars have pointed to the possible migration from Mexico of earlier groups who brought agricultural practices to the U.S. Southwest (Huckell 1990; Matson 1991), and new perspectives have suggested that these migrating groups were part of the Uto-Aztecan language family (LeBlanc 2008; Mabry et al. 2008; Merrill et al. 2009). The relatively sedentary agricultural populations in the Phoenix and Tucson Basins prior to the Pioneer period may have been the ancestors of the Hohokam, although it is still likely that the Hohokam were influenced by cultural traits and developments of Mesoamerican origins, particularly in the Phoenix Basin.

The Colonial and Sedentary periods (ca. A.D. 750–1150) represent the greatest spatial extent of Hohokam settlements in Arizona (Ciolek-Torrello 2012; Doyel and Elson 1985a). Hohokam ball courts appeared during the Colonial period (ca. A.D. 750) and are associated with large, primary villages, with houses arranged in courtyard groups that likely functioned as the residences of extended families or lineage groups (Abbott 2000; Ciolek-Torrello 2012; Doelle et al. 1987; Doyel 1985; Whittlesey 2003; Whittlesey et al. 1994; Wilcox and Sternberg 1983). Settlements were located in multiple areas, including both riverine locations, where agriculture was practiced, and upland (or nonriverine) resource-procurement locations. Unlike the preceding Late Archaic/Early Agricultural and Early Ceramic periods, the pre-Classic period has a more clearly recognizable organization of site types. For instance, the primary villages were usually associated with large, integrative or communal features, such as ball courts, and were located on terraces adjacent to rivers, and irrigation agriculture was practiced along the floodplain. Smaller site types, such as hamlets, farmsteads, and field houses, were located away from the primary villages but likely had social and economic ties to the larger villages (Ciolek-Torrello 1988; Ciolek-Torrello and Greenwald 1988; Doelle et al. 1987). These smaller sites presumably interacted with and provided necessary goods to primary villages through such activities as procuring natural resources or tending agricultural fields from outside the core settlement areas (Doelle et al. 1987). During the Sedentary period (ca. A.D. 1000–1150), settlement patterns remained focused on primary villages, with secondary habitations located in other areas (Craig and Wallace 1987; Doelle and Wallace 1986; Doyel 1984; Elson 1986).

At the beginning of the Classic period (ca. A.D. 1150–1450), the use of ball courts virtually ceased; platform mounds were introduced to the architectural suite of large, primary Hohokam villages, and dramatic shifts occurred in settlement and land use (Abbott 2000; Wilcox 1991). The Classic period witnessed an overall intensification of irrigation agriculture along major drainages, such as the Gila and Salt Rivers of the Phoenix Basin, and to a lesser extent along the Santa Cruz River in the Tucson Basin, as evidenced by canals associated with the Marana Platform Mound (Fish et al. 1992). In both the Tucson and Phoenix Basins, the previous settlement patterns were drastically altered, and populations aggregated in large, primary villages, with smaller satellite communities located in proximity to the primary villages. This shift in settlement strategy has broader implications than just site location. Because of the dispersed settlement patterns during the pre-Classic period, Hohokam ball courts are believed to have acted to integrate different communities through ritual activity. The replacement of ball courts with platform mounds is associated with increased aggregation at large riverine villages and represents a significant change in ritual and/or social organization (Abbott 2000; Ciolek-Torrello 2012). The internal complexity of Hohokam villages also increased during the Classic period. This change was more pronounced at the major villages along the Salt and Gila Rivers in the Phoenix Basin.

Protohistoric and Early Historical Period (ca. A.D. 1450–1800)

Large Classic period Hohokam habitation sites appear to have been abandoned ca. A.D. 1450 in central Arizona, as well as in much of the southern and upland U.S. Southwest. This abandonment and apparent population decline traditionally marks the beginning of the Protohistoric period (Doyel 1989; Martynec et al. 1994; Rieder and Slawson 2002; Whittlesey et al. 1994; Yost et al. 2001).

The historical period is often defined as beginning with the first Spanish *entradas* from northern Mexico—the explorations of Fray Marcos de Niza in 1539 and Coronado in 1540. Despite the fact that the Spanish first arrived in the region in 1539, there was very little European contact with Native Americans in central Arizona until the late 1600s. By this time, the Spanish began more-intensive exploration of southern Arizona and northern Mexico, as well as establishing missions and *rancherías*. Most notable was the Jesuit missionary Eusebio Francisco Kino, who traveled throughout Sonora and southern Arizona and provided some of the earliest documentation of the indigenous people living in the area (Bolton 1948, 1984). Three primary indigenous groups inhabited southern Arizona during the Protohistoric period, differentiated by their respective linguistic groups: the Piman-speaking people, the Athapaskan speakers, and the Yuman speakers. Piman-speaking groups include the contemporary O'odham people. Yuman-speaking groups include the Yavapai, Mohave, Quechan, and Cocopah. Apaches speak an Athapaskan dialect.

The Apaches were a diverse group of highly mobile hunters and foragers who occasionally farmed. Their knowledge of the mountainous regions of southern and central Arizona made them especially skilled at locating resources and adapting to hardships (Goodwin 1969). Throughout the history of interaction between Apaches and Europeans, the Apaches maintained their mobile lifeways; they were eventually forced into reservations in east-central Arizona by the 1870s and 1880s, as a result of constant military suppression by the U.S. government (Kelly 1953; Thrapp 1967).

Different Piman-speaking (O'odham) peoples were distinguished by their respective settlement and subsistence practices. The Hia C'ed O'odham, or Sand People, were the most mobile of the O'odham, living in the western deserts, as far south as the Gulf of California. The Tohono O'odham, or Desert People, shifted between summer farming villages and winter hunting-and-gathering encampments. The Akimel O'odham, or River People, stayed in permanent, year-round villages along the Gila River that had a focus on agriculture (Fontana 1983).

Native Americans of the lower Colorado and Gila River regions include the Yuman speakers, who occupied large portions of western Arizona, southern California, and northwestern Mexico (Kroeber 1943). Kroeber (1943) divided the Yuman speakers into four branches: the Colorado River Delta groups (Cocopah, Kohuana, and Halyikwamai), the River Yumans along the Colorado and Gila Rivers (Yuma or Quechan, Mohave, Halchindhoma, and Maricopa), the Upland Yumans of Western Arizona (Yavapai, Walapai, and

Havasupai), and the Western Yumans of the California Deserts (Diegueño, Kamia, Kailiwa, and Paipai). Yuman subsistence consisted mainly of a combination of hunting, fishing, agriculture, and gathering along the Gila and Colorado Rivers. Cultivated crops, including corn, beans, squash, grasses, and melons, were used mainly by the Mohave tribes and were cultivated using almost exclusively floodwater-farming techniques. Wild-plant foods consisted primarily of mesquite, which in concert with fishing and small-game hunting, provided most of the dietary fat and fiber for these groups (Kroeber 1943).

In 1848, the Treaty of Guadalupe Hidalgo established the area north of the Gila River, in what is now Arizona, as part of the United States. Soon after, the gold rush prompted thousands of Euro-Americans to cross the Arizona deserts toward California, in search of mining opportunities. The Gila River became a major conduit of travel, leading to increased contact between Euro-Americans and the Akimel O'odham. In 1853, the Gadsden Purchase placed the area south of the Gila River under U.S. control.

Apache raiding and conflicts between Apache groups and the new Euro-American immigrants to the region were major determinative factors during the late historical period. For instance, much of the Salt River area within the Phoenix Basin was not occupied by O'odham people because of Apache raids, which left an open niche for Euro-American immigrants. From the 1850s to the 1880s, the U.S. Army had a significant presence throughout southeastern Arizona, providing protection for the new settlements. By 1886, with the surrender of Geronimo to U.S. Army forces in Mexico, just south of the San Bernardino Ranch, the last of the Apache groups in Arizona had been forced onto reservations to the north and east of the Phoenix Basin. This forced elimination of the Apaches from the region opened the way for more-intensified Euro-American settlement and land use (Martynec et al. 1994; Van Orden 1994:2–4).

Historical Period (ca. A.D. 1800–1950)

Thompson (2007, 2010) has provided an excellent, in-depth history of the project area, and his work is used here. Early attempts to develop land in the lower Agua Fria River valley date to the late 1880s. In November 1888, a group of Phoenix investors organized the Agua Fria Water and Land Company, for the purpose of building a diversion dam, two reservoir dams, a 50-mile-long main canal, and 200 miles of laterals that would store and deliver water to over 100,000 acres of vacant public land west of the Agua Fria River. Work on the diversion dam (located approximately 25 miles north of the current project area) began in March 1892, but financial setbacks and federal restrictions halted the project 3 years later.

Between 1898 and 1918, the Agua Fria Water and Land Company, under the direction of William Beardsley, tried unsuccessfully to resurrect the project. Backed by capital from new investors, work on the diversion dam resumed in the 1920s, and the Lake Pleasant Dam (now known as Waddell Dam) was completed in 1927 (Introcaso 1988:2–15). In her history of Litchfield Park, Smith (1948:5–6) noted that, in the 1890s, a group of Quakers established a small settlement along the west bank of the Agua Fria River, about 1/2 mile north of the old Yuma road (near present-day Interstate 10). These farmers dug irrigation ditches to divert water from the Agua Fria River to their crops. Smith's (1948) treatment of the settlement is brief and makes no mention of whether the farmers were successful or were forced to abandon their endeavor.

The first sustained agricultural effort in the lower Agua Fria River valley occurred in 1910. William G. Kreigbaum, a citrus grower from Riverside, California, visited the region in 1908 and quickly recognized its agricultural potential. Upon his return to California, he assembled a group of investors and organized the Air Line Water Company to develop the vast tracts of unclaimed land west of the river. The settlers, many of whom came from California, filed claims under the Homestead and Desert Land Acts or purchased land from the Santa Fe Pacific Railroad Company, who had obtained approximately 39,000 acres in the lower Agua Fria River valley. Kreigbaum applied for 640 acres under the Desert Land Act of 1877, laying claim to land that now lies in the center of Litchfield Park, 2 miles south of the current project area. Construction of the Air Line Canal began in the summer of 1910. The unlined canal measured approximately 8 feet wide and 5 feet deep and originated from a reservoir located on the west bank of the Agua Fria River in Section 12, Township 2 North, Range 1 West. Laterals built along section lines carried water to individual tracts of land; from there, the farmers dug ditches off the laterals to irrigate their fields. As more land was brought under cultivation, the Air Line Water Company drilled wells at points along the canal, to augment the supply of water diverted from the river. By 1914, approximately 5,000 acres had been planted with citrus, sorghum, and various grains. Kriegbaum and his fellow investors intended to raise citrus as their primary cash crop; however, a severe frost destroyed the inaugural crop in January 1914. This devastating loss, coupled with other financial setbacks, compelled the Air Line Water Company and many of the farmers who settled the area to sell their land to agents representing the Goodyear Tire and Rubber Company of Akron, Ohio, in 1916 (Smith 1948:9–24).

Goodyear's interest in the area was precipitated by events associated with World War I. Long-staple cotton was used in the manufacture of their pneumatic truck tires, with the best grades coming from Egypt's Nile River Valley and the Sea Islands off the Georgia coast. A wartime embargo of Egyptian cotton and a boll-weevil infestation that ravaged the crop in the Southeast forced the tire manufacturer to scramble to obtain a steady, reliable supply. Upon learning that the U.S. Department of Agriculture had experimented with growing long-staple cotton in central Arizona's Salt River Valley, where the soil and sun conditions are similar to those found in Egypt, Goodyear sent one of its junior executives, Paul W. Litchfield, to Phoenix in 1916 to interest farmers in raising cotton for a guaranteed price. After considering the risks, the farmers refused the offer. In a bold move, Litchfield recommended that Goodyear undertake its own cotton-raising venture. Litchfield was placed in charge of the program to develop a commercial cotton-growing enterprise and, in late 1916, Goodyear purchased two tracts of land—8,000 acres in Chandler, southeast of Phoenix, and 16,000 acres along the Agua Fria River, 18 miles west of Phoenix. (The Agua Fria Water and Land Company sold 6,000 acres of the project's service area—land it had purchased in 1910 from the Santa Fe Pacific Railroad Company—to the Goodyear Tire and Rubber Company [Introcaso 1988:45].) Farming operations were managed by the Southwest Cotton Company, a subsidiary of Goodyear. Six thousand acres, named the Litchfield Ranch, were cleared, leveled, and planted with cotton by May 1917. In the fall of that year, the Southwest Cotton Company harvested 1,500 bales of cotton. The company improved the Air Line Canal by adding concrete sides and extending the laterals and ditches. Water diverted from the Agua Fria River and pumped from numerous wells irrigated the company fields. The construction of Pleasant Dam on the Agua Fria River significantly reduced the flow of river water to the cultivated lands, forcing the company to drill more wells to meet the increasing demand for water (Allen 1949:150–153; Goodyear Tire and Rubber Company 1953:7; Introcaso 1988:97; Smith 1948:32). Goodyear established a camp—named Algodon (Spanish for "cotton")—to house laborers and serve as headquarters during the initial stages of clearing the land and planting crops. Soon, a small community sprouted around the field office and the buildings used for farm operations. Goodyear named the community Litchfield, after the man who spearheaded the agricultural enterprise.

The U.S. Post Office Department refused to designate the community as Litchfield, because of the name's similarity to another Arizona town named Littlefield, and named it Lichton, instead. After several years of wrangling between Goodyear and Post Office officials, the town officially became known as Litchfield Park in 1926 (Schetter 1984:4, 12). Cotton production soared, along with the price per bale, which increased from $233 to $406 between 1916 and 1919. By 1920, the cotton industry witnessed significant declines in revenue as the federal government canceled contracts for both cotton and tires and Egyptian long-staple cotton flooded the market. The market recovered in the late 1920s, although production did not reach its previous levels (Sheridan 1995:212–213, 253). Cotton production decreased between 1933 and 1936 under the New Deal's Agricultural Adjustment Act of 1933, when the federal government attempted to control the production of commodities in order to stabilize prices (Sheridan 1995:257–258). When the cotton market fluctuated during the 1920s and 1930s, the Southwest Cotton Company, as well as independent farmers in the vicinity of the Litchfield Ranch, survived by diversifying their farming activities to include stock raising and the growing of alfalfa, wheat, sorghum, maize, and citrus (Allen 1949:157). In 1943, the Southwest Cotton Company changed its name to Goodyear Farms, to better reflect its diverse agricultural activities (Goodyear Tire and Rubber Company 1953:18).

In the 1910s, adverse economic conditions at home and abroad had helped engineer the cotton boom in Arizona and led to the development of lands west of the lower Agua Fria River. Two decades later, the federal government's response to foreign wars started a series of events that impacted the local landscape once again. In the mid-1930s, with the specter of war looming over Europe, the United States enacted legislation to maintain its policy of geographical isolation and neutrality. By the fall of 1939, Germany had invaded Poland, and an all-out war was raging in China. The culmination of these world events eventually forced the United States to abandon neutrality and begin a massive buildup of its air, land, and sea forces. As the United States prepared for war in Europe, the U.S. Army Air Corps expanded dramatically, incorporating three major tasks: the production of aircraft, the recruiting and training of personnel, and the acquisition of land for the construction of airfields and training facilities (Cate and Williams 1983:104–105). Vast expanses of inexpensive desert land and year-round flying weather attracted military planners to Arizona. In February 1941, the U.S. War Department announced plans to establish an advanced single-engine flight-training school outside Phoenix. Military inspectors selected a 1,440-acre site 2 miles north of Litchfield Park and 8 miles west of Glendale. Eager to benefit from the revenue that a military installation would bring, Phoenix officials purchased the land for $40,000 and leased it to the U.S. War Department for $1 a year (Luckingham 1989:137). The U.S. War Department named the base Luke Field, in honor of World War I ace and Medal of Honor recipient Frank Luke, Jr., a Phoenix native. From 1941 to 1946, Luke Field trained thousands of U.S. and Allied pilots (Provence 1954:2–32). The U.S. War Department closed Luke Field in November 1946 but reactivated the facility as LAFB in February 1951, in response to the outbreak of the Korean War. Over the ensuing years, the U.S. Air Force acquired surrounding tracts of developed and undeveloped land to accommodate runway extensions and the construction of additional buildings and facilities for base operations.

Previous Archaeological Investigations

Despite a proliferation of archaeological work in the Phoenix Basin over the last 100 years, very little has been conducted in the immediate vicinity (i.e., within 10 km) of LAFB. Most of the archaeological investigations in the western Phoenix Basin were carried out along the Agua Fria River, but even these projects were conducted 20–40 km from LAFB. Summaries of previous archaeological investigations along the Agua Fria were included in Graves et al. (2009), Tagg (2007, 2008), and Tagg et al. (2007). These discussions focused on large archaeological projects, such as the Waddell Project (Green 1986, 1989; Green and Effland 1985), located approximately 35 km north of LAFB near Lake Pleasant. Other important archaeological projects discussed in Graves et al. (2009) include work at several Hohokam villages and canal systems located near the Gila–Salt–Agua Fria River confluences, such as the Cashion Ruin complex. These studies included numerous Hohokam culture sites and provided a general overview of some of the archaeological investigations conducted in the western Phoenix Basin over the last 100 years. Unfortunately, these studies were not able to provide much evidence for Archaic period occupations in the western Phoenix Basin. As a result, we have turned to a study by Rogge (2009) that investigated the Archaic period occupations of the northeastern Phoenix Basin. This study stands as an excellent source of information regarding the diversity of Archaic period remains in the region, which can be difficult to characterize. The following discussion of previous archaeological investigations will focus on important areas in proximity to LAFB, such as the Rogge's study area, the lower Agua Fria River valley, the White Tank Mountains, as well as sites in the immediate vicinity of LAFB (see Figure 2).

Rogge Study Area

Most of the evidence for an Archaic period occupation in the Phoenix Basin has been in the form of isolated projectile points, flaked and ground stone scatters, or sites with later components that contained Archaic period–style projectile points. Rogge (2009:70–77) conducted an archival search for all Archaic period sites within a 25 km radius of the Last Ditch site. Rogge's study area (Figure 7) focused on the northeast Phoenix Basin, extending from the Verde River west to the New River and from the Salt River north to the upper Cave Creek drainage. Rogge (2009:Table 13) identified 23 Archaic period sites and characterized the function

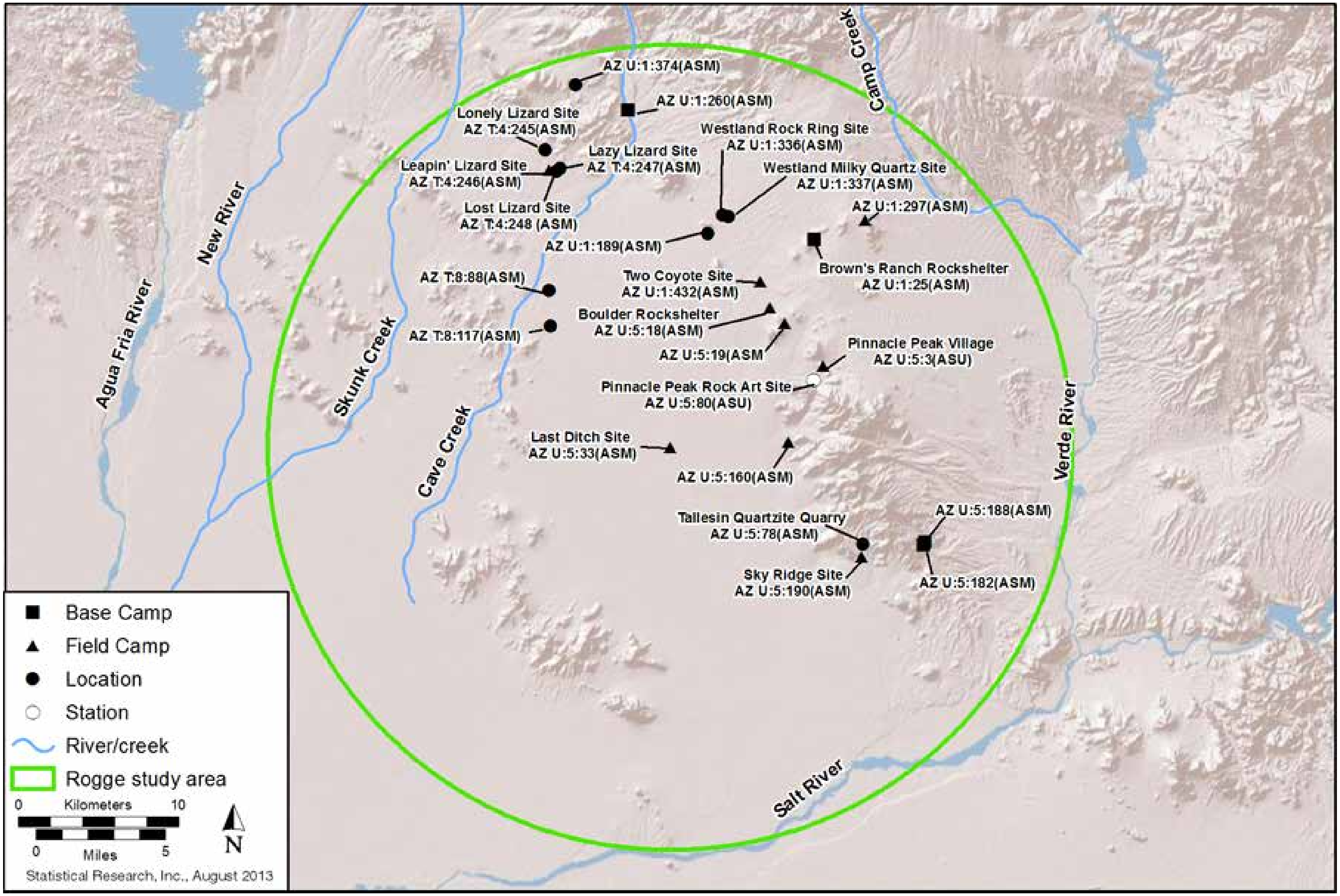

Figure 7. Archaeological sites included in Rogge's (2009) study area.

of each site using Binford's (1980, 1994) model of foraging strategies. Archaic period sites identified in the study area include base camps (n = 4), field camps (n = 7), locations (n = 11), and stations (n = 1). Overall, Rogge's study area captured a wide range of variability of Archaic period sites, from residential base camps to resource-collecting locations. This variability is likely indicative of the subsistence and settlement practices used by Archaic period groups in the region. Rogge (2009:70) pointed out that, although the Archaic period sites are distributed throughout the landscape, no sites were identified to the south or west of the Last Ditch site (Rogge 2009:Figure 13) (see Figure 7). This portion of the study area also corresponds to the Lower Colorado Valley Subdivision of the Sonoran Desert. Rogge interpreted this as Archaic period groups showing preference for the Arizona Upland Subdivision biotic community over the lower-elevation areas of the Phoenix Basin. The following is a summary of the Archaic period sites identified by Rogge (2009).

Base camps are characterized as residential bases containing the highest artifact and feature diversity, and they are usually directly associated with vital resources, such as permanent water, rockshelters, and rich food-resource patches. The four Archaic period base camps in the study area (Rogge 2009:74) included two rockshelters, one of which is Brown's Rock Shelter (Wright 1996, 2002), a multicomponent site located north of the McDowell Mountains. Archaeological testing of Brown's Rock Shelter uncovered Early, Middle, and Late Archaic period projectile point types (Marshall and Bostwick 1999); however, the Archaic period component was difficult to define because of mixed deposits from later Hohokam and Yavapai uses of the shelter. Another rockshelter in the study area, AZ U:1:260 (ASM), is located along the upper Cave Creek drainage, but evidence of an Archaic period occupation was limited. The last two Archaic period base camps in the study area are located in the southern McDowell Mountains: AZ U:5:182 (ASM) and AZ U:5:188 (ASM) (Stubing and Mitchell 1999). AZ U:5:182 (ASM) contains a substantial midden deposit associated with a high-density flaked and ground stone artifact concentration. AZ U:5:182 (ASM) is smaller but also has a midden and a flaked and ground stone artifact scatter. The Archaic period affiliation of these sites was based on the presence of temporally diagnostic projectile point fragments. As depicted by Rogge (2009:Figure 13), base camps are located in a variety of settings. AZ U:1:260 (ASM) is located in the Cave Creek drainage bottom, Brown's Rockshelter is located in the upper *bajada*, and AZ U:5:182 and AZ U:5:183 are on the slopes of the McDowell Mountains (see Figure 7).

Field camps are characterized as sites visited regularly for resource-procurement and -processing activities. Field camps are occupied on a temporary basis and would include ephemeral structures. These sites have less artifact diversity than base camps but still maintain a relatively high archaeological visibility. For example, the Last Ditch site is considered a logistical field camp where Archaic period groups periodically visited in order to collect seasonally available resources (Phillips et al. 2001:62; Rogge 2009:77). Field camps in Rogge's study area included seven sites with evidence of an Archaic period occupation, based on the presence of temporally diagnostic projectile points, flaked stone scatters, bedrock mortars, and middens (Rogge 2009:74–75). Boulder Rockshelter (AZ U:5:18 [ASM]), had direct evidence of an Archaic period occupation, with the lowest identified occupational strata containing a Middle Archaic (Chiricahua phase) and two Late Archaic period (Cienega phase) projectile points (Hohmann 1999). According to Rogge (2009:Figure 13), field camps were found exclusively in the middle–upper *bajada* settings (see Figure 7). This pattern suggests *bajada* settings were preferred for resource-procurement forays during the Archaic period (see also Roth and Freeman 2008).

Location sites are characterized as places visited briefly by small groups for resource-procurement and -processing activities. These locations are similar in function to field camps, but were not occupied or visited with the same regularity. The 11 location sites are distributed throughout the study area, with 6 located in the *bajada*, 3 located along major drainages, and 1 in the McDowell Mountains (Rogge 2009:75–77). The location sites were determined to be associated with the Archaic period, based on the presence of flaked and ground stone concentrations. Two of the locations are lithic quarries. Rogge (2009:Figure 13) showed that location sites are evenly distributed across different landscape positions (see Figure 7).

Stations are considered places where individuals or small groups visit to gather information, such as monitoring game or other possible ritual activities. A single station was identified in Rogge's study area: the Pinnacle Peak Rock Art site (AZ U:5:80 [ASM]), located in the northern end of the McDowell Mountains (see Figure 7). Although the majority of the petroglyphs at this site are likely Hohokam and Protohistoric Yavapai, some have been interpreted as dating to the Archaic period (Rogge 2009:77).

Located just outside of Rogge's study area is another possible Middle–Late Archaic period site (AZ T:4:122 [ASM]), recently reported along Deadman Wash along the *bajada* between New River and Skunk Creek in the Anthem project area (Potter and Neal 2000). SWCA Environmental Consultants (SWCA) conducted data recovery at AZ T:4:122 (ASM) and identified two cultural strata. The lower strata (Stratum II) consisted of a jumbled A-horizon with few ceramic artifacts and a high proportion of flaked stone artifacts (Potter 2002:195). Six radiocarbon dates from Stratum II placed the occupation between A.D. 1 and 600. Several Middle Archaic period dart points were recovered, including San Jose, Chiricahua, Cortaro, as well as possibly Late Archaic period style Gypsum and San Pedro (see Potter 2002:Figure 54). The association of Middle Archaic period points and the A.D. 1–600 date range suggests the points were curated by later inhabitants, or the dates obtained from Stratum II do not reflect the Archaic period occupation.

The data obtained from Rogge's study area indicated that Archaic period occupations are few and difficult to interpret in the northeast Phoenix Basin. This situation is likely the case in the vicinity of LAFB. About one-half of the Archaic period sites listed in Rogge's study area have no direct evidence of an Archaic period component but have been interpreted as dating to the Archaic period based on the presence of flaked and ground stone artifacts and a lack of ceramic artifacts. Other sites in the study area have Archaic period projectile points but no direct dates or secure Archaic period contexts. Brown's Rock Shelter and Boulder Rockshelter are the only excavated sites with direct evidence of Archaic period occupation, containing stratified deposits and Archaic period projectile points. Because of the limited nature of these finds elsewhere in the Phoenix Basin, most archaeologists have only speculated on Archaic period settlement patterns. For example, as Green (1986:7) reiterates, it is possible that some of the thousands of flaked stone artifacts that carpet the Agua Fria and New River borrow areas around Lake Pleasant are from the Archaic period.

Gila–Salt–Agua Fria River Confluences

Ciolek-Torrello et al. (2007); Ciolek-Torrello et al. (2009); Onken and Ciolek-Torrello (2005); and Tagg (2007:23–32) have provided excellent and in-depth discussions of the previous archaeological investigations of the western Phoenix Basin, or northern periphery, and much of their discussions are used here. Early archaeological work in the Phoenix Basin included some important investigations in the lower Salt River Valley. In the 1920s, Omar Turney (1929), the City of Phoenix archaeologist, was among the first to map the extensive network of canals and settlements in the Phoenix Basin (see also Hodge 1893; Patrick 1903). As part of this research, Turney mapped Canal 12 at the western edge of the basin near the confluence of the Salt and Gila Rivers. Following Turney's footsteps, Frank Midvale developed an interest in prehistoric irrigation in southern Arizona, and for the next 40 years, he explored the region, detailing a number of Hohokam irrigation and settlement systems. During the 1930s, Midvale (1968) remapped the location of Canal 12, which he named Canal Cashion. The Cashion Canal is the westernmost canal in the Salt River canal system and is associated with the occupation of the Cashion site complex. Canal Cashion followed a similar trajectory as Canal 12 was originally mapped, but Midvale identified two secondary canals running in a northwestern direction from the main canal (McLean and Perry 2002:21). The validity of Midvale's data, however, has been questioned (Antieau 1981; McLean and Perry 2002:22).

In 1927, as part of his research, Midvale provided the first map of the Cashion Ruins (see Figure 2), which he first called Los Conejos (Antieau 1981:144). He later identified several other sites in the area, which, because of their proximity to one another, he considered part of the same Cashion complex. The Cashion Ruin was the westernmost and largest site in the complex. Midvale referred to Hacha Piedra as the central unit and Pueblo Poniente as the eastern unit (Antieau 1981:142). The Cashion complex is the largest site in the region at the confluence of the Agua Fria, Salt, and Gila Rivers and is one of the largest and most complex pre-Classic period sites in the entire Phoenix Basin, reputedly rivaling Snaketown in size (Antieau 1981; McLean and Perry 2002:23; Stein 1977). The main Cashion Ruin was occupied from the Pioneer period through the Sedentary period. Antieau (1981) concluded that Pueblo Poniente was established in the early Classic period and abandoned in the late Classic period, based on the presence of a large compound and polychrome ceramics.

No other large settlements are known east of the Cashion complex until the Tolleson Ruin and Pueblo del Alamo near the terminal ends of branches of Canal System 6, located 5–8 km to the northeast. Midvale (1970) also discovered numerous sites and two canal systems west of Cashion in the lower Agua Fria valley (Antieau 1981:8). One system headed on the Agua Fria River, approximately 6 km north of its confluence with the Gila River and flowed south-southwest along the lower edge of the first terrace past the Cold water Ruin to fields near the confluence. The second system headed at the confluence of the Agua Fria and Gila Rivers and flowed westward along the edge of the first terrace for a distance of more than 12 km. The latter system supplied several other Hohokam villages, including the Van Liere, Alkali, Coldwater, Morocco, and Brewster sites west of the confluence. In addition to these sites, the La Cienega and Lakin sites were discovered east of the confluence near the possible western terminus of Canal 12. The Van Liere, Alkali, and La Cienega sites were all determined to be pre-Classic period settlements that, like the Cashion Ruin, had been abandoned at the end of the Sedentary period (Antieau 1981:361). By contrast, the Brewster and Coldwater sites were established during the Colonial period and continued to be occupied well into the late Classic period; the Morocco site, like Pueblo Poniente in the Cashion complex itself, was established in the early Classic period. A number of small-scale investigations were carried out at the Cashion Ruin and neighboring sites. The most notable of these was the Salt River Valley Stratigraphic Survey, a Works Progress Administration–era investigation (Kelly 1940) during which test trenches were excavated at two of the trash mounds at the Cashion Ruin.

The first investigations in the lower Salt River Valley occurred in 1977 and 1978, when the Cashion Ruin and several other sites in the area were excavated by the Museum of Northern Arizona (MNA) as part of the Palo Verde Nuclear Generating Station Wastewater Conveyance System project (Antieau 1981). Antieau's work included only 2 percent of the approximately 640 acres encompassed by the complex, but it resulted in the excavation of 30 pit houses, 6 *hornos*, 15 trash pits, 51 cremations, and 2 inhumations from the main part of the complex. The cultural materials recovered from these excavations principally represent the Sedentary period. The paucity of material from other time periods greatly limited Antieau's ability to make any significant statements about those periods. Little information was recovered regarding Hacha Piedra and Pueblo Poniente. A few features were found during monitoring at NA15687, which Antieau suggested was part of Hacha Piedra. These included 2 small cooking pits and several other small pits (Antieau 1981:142–146). In addition to these excavations, test excavations and monitoring activities were undertaken at portions of the Lakin, Coldwater, Alkali, and Morocco sites (Antieau 1981:248–259). By contrast, excavations revealed a number of features at the Van Liere site, where data recovery revealed 12 pit houses, many other domestic features, and a large prehistoric canal identified by Antieau (1981:289) as the Van Liere branch of Canal Liberty.

Additional work in the area since MNA's research has helped to resolve some of the locational issues about the Cashion Ruin and its associated canals. Howard (1995) rerecorded Pueblo Poniente as AZ T:11:53 (ASM) while surveying a parcel in the vicinity. Between 1997 and 1999, Arizona State University (ASU) conducted test excavations and an overview of the Cashion area that has helped to pinpoint the locations of the various sites that make up the Cashion complex and to assess the condition of the remaining portions of the site. More recently, in 2003–2004, Soil Systems, Inc. (SSI), conducted archaeological test excavations and data recovery at the Cashion Ruin in advance of the construction of a housing development (Cory Breternitz, personal communication 2004).

A survey conducted by the U.S. Army Corps of Engineers (USACE) as part of the Tres Rios project has provided useful information about the Salt-Gila confluence area (McLean and Perry 2002). The USACE identified two additional sites in the Cashion complex, AZ T:11:93 (ASM) and AZ T:11:94 (ASM), which have been the subject of investigations conducted by SRI (Onken and Ciolek-Torrello 2005; Onken et al. 2004). SRI conducted a geoarchaeological investigation to assess the potential for buried archaeological sites and to map the surface morphology of the Salt–Gila–Agua Fria area. This study documented a flight of three terraces (T1–T3) flanking the modern channels (T0) of the Salt and Gila Rivers (Onken et al. 2004). The highest terrace is T3, which dates to the Pleistocene and is separated from T2 by a distinct scarp. Locally, a low, often subtle, scarp separates T1 and T2; however, in many places, the T1 alluvium has completely infilled the channel incised into the T2 surface, and the scarp has no surface expression. Four Holocene stratigraphic units were identified within the trenches and tentatively correlated with Units I–IV documented nearby on the middle Gila River by Waters and Ravesloot (2001). A prehistoric pit house, Feature 1, was found at AZ T:11:94 (ASM) within Unit III, which consists of silty overbank deposits dating between 2000 and 500 B.P.; two thin, charcoal-rich lenses were noted within Unit IV, which consists of sandy channel deposits presumably deposited between about 950 and 200 B.P. These lenses may represent field-burning events. Five radiocarbon dates obtained from these various units suggest that the lower Salt River alluvial chronology is basically identical to that of the middle Gila River (McLean and Perry 2002). In a second project, SRI completed archaeological testing at AZ T:11:94 (ASM) (Onken and Ciolek-Torrello 2005). Additional prehistoric features were found, including a second possible pit house, a small *horno*, and several firepits. Subsequent data recovery at AZ T:11:94 (ASM) uncovered an Early Archaic period component, as well as Colonial to Sedentary period field houses and a possible canal (Graves et al. 2011).

The Lower Agua Fria River Valley: Lake Pleasant and New River Areas

Many sites reported north of the confluence of the Agua Fria and Gila Rivers are located in the lower Agua Fria River area, although information about these sites is variable. For instance, Gladwin (1930) investigated part of the Agua Fria drainage, but the exact locations of the sites from that survey are not well documented (Green 1986:8). Most of the archaeological work conducted along or near the Agua Fria River has been focused in two areas: the area around the confluence of the Agua Fria and Gila Rivers (described above), and the area surrounding Lake Pleasant to the north.

Most of the archaeological investigations along the Agua Fria River have been conducted in the vicinity of Lake Pleasant, 35 km northeast of LAFB. The Waddell Project is the most comprehensive archaeological investigation of the area surrounding Lake Pleasant (Green 1989). The Waddell Project included archaeological data recovery of 17 sites within the Agua Fria and New River Borrow areas, as well as archaeological survey of areas impacted by the construction of New Waddell Dam (Green 1989:3). According to Green (1986:1), the Agua Fria and New River Borrow areas were to be used by the Bureau of Reclamation for "borrow" and for ancillary water-control features related to the New Waddell Dam construction and operation. The borrow areas were located along the Agua Fria and New River drainages, respectively, immediately south and southeast of Lake Pleasant (see Figure 2). Green (1986) provided a good discussion of this work, so it is only briefly mentioned here. The earliest archaeological work in the lower Agua Fria drainage was conducted by Fewkes (1912). He visited the sites around Frog Tanks near Waddell Dam (now under Lake Pleasant) (Dove 1984) and also investigated the Calderwood Butte site (Green 1986:8). Calderwood Butte, located along the Agua Fria River about 40 km north of its confluence with the Gila River, is one of the few areas in the Agua Fria River valley suitable for prehistoric irrigation agriculture and one of the most heavily settled areas of the valley in prehistory (Weaver 1974:52). In addition to his studies of the Salt River Valley, Turney (1929:141–145) described Casa de Piedras (AZ T:7:2 [ASM]/AZ T:7:5 [ASU]), located along the Agua Fria River across from Calderwood Butte and south of Lake Pleasant. This site consists of a large compound enclosing small courtyards and large masonry rooms, which suggests that it dates to between the late Sedentary and the Classic period. A smaller compound and several trash mounds are located in the vicinity of this site. He also noted abundant petroglyphs in the area, especially on the south side of the butte, as well as "stone ruins" on the east side of the Agua Fria River (Green 1986:8). In 1970, a group of local amateurs began intensive surveys and excavations in the vicinity of Calderwood Butte, recording over 70 sites along a 3-mile-long stretch of the Agua Fria. On the basis of this survey, Dove (1970:27) argued that the major period of occupation of the area occurred between A.D. 700 and 1450, with the most-intensive occupation during the Colonial period. The largest site investigated by the amateurs was the Calderwood Butte site, a large masonry-walled compound similar to Casa de Piedras. In contrast to the majority of the sites in the area, Dove (1970:14) attributed Calderwood Butte to the late Sedentary and Classic periods.

Beginning in the spring of 1963 and continuing through 1965, the Department of Anthropology at ASU conducted a sample survey of the Agua Fria River area from Lake Pleasant to Glendale, although most of the work was confined to a narrow belt along the river channel (Ruppé 1966). Although much of the survey was conducted by four-wheel-drive vehicles, 343 sites were able to be documented. A 24-km stretch of the Agua Fria and New Rivers was surveyed and 107 sites were documented along these drainages. Ruppé (1966:4) described most of these sites as small, masonry pueblos with 1 to more than 20 rooms. Plain red and plain brown ceramics were abundant, and Hohokam Buff Ware was present at half of the sites, with Sacaton Red-on-buff being the dominant decorated type. Greenwald's (1988) excavations at the Baccharis site, a small late Pioneer and early Colonial period farmstead, are also pertinent to understanding the Hohokam occupation of the lower Agua Fria River valley. Although the site is located along the New River near its confluence with Skunk Creek, it has yielded important information about early subsistence and settlement of the region. Based on his excavations at this site, Greenwald (1988) has argued that the earliest farming settlements represented recurrent seasonal occupations and that permanent villages had not been established until the late Colonial and Sedentary periods.

Weaver's (1974) excavation of the Westwing site, conducted by the Department of Anthropology at ASU, shed light on one of the small habitation sites in this complex that dated entirely to the Sedentary period and had evidence of agriculture. Two pit houses were documented, but only a small portion of the site was excavated (Green 1986:15). Still later, working under the auspices of the MNA, Rodgers (1987) excavated the Eastwing site, a small Sacaton phase settlement in this complex. During the late 1960s and early 1970s, Midvale conducted sporadic surveys of the Calderwood Butte area (Weaver 1974:9). He located one major canal, originating just north of the butte and flowing south along the base of the first bench on the west bank of the river. He also noted extensive mesa-top gardens and water-control devices. Rodgers' (1985:294–296) research in the adjacent New River drainage demonstrated that the prehistoric farmers of the region used a variety of farming techniques, including floodwater farming, various methods of moisture enhancement, and even dry-farming techniques.

In 1963, 15 km north of Calderwood, the ASM inventoried the Lake Pleasant Regional Park as part of a larger survey of five Maricopa County regional parks (Johnson 1963). They documented five sites, consisting of two small villages (farmsteads) with possible subsurface structures, a hilltop masonry site, a masonry field house, and a ceramic and lithic scatter. The sites were affiliated with the Hohokam and dated sometime between A.D. 700 and 1450, based on Gila Plain ceramics. Dove (1970, 1984) surveyed 4 km along the Agua Fria River near Calderwood Butte and recorded 85 sites. These were mostly habitations but also included agricultural fields and a prehistoric canal. Based on the ceramic artifacts, most of the sites were dated to the Sacaton phase, but there was also evidence suggestive of the Santa Cruz phase and early Classic period (Green 1986:8–14).

In this same area, located at the southern edge of Lake Pleasant, is the Beardsley Canal site. Along with Weaver's Westwing site, Rodgers' Eastwing excavations, and the Henderson site at the upper reaches of the Agua Fria near Cordes Junction, this site provides the only detailed evidence about the numerous pre-Classic period settlements in the Agua Fria region (Weed 1972; Weed and Ward 1970). Excavations at the Beardsley Canal site by the ASM in 1971 and 1972 uncovered a large pit house village with associated ramadas, work areas, outdoor hearths, roasting pits, trash mounds, and secondary cremation burials. The decorated ceramics from these excavations ranged from Snaketown to Sacaton Red-on-buff, although Colonial period Gila Butte Red-on-buff and Santa Cruz Red-on-buff were the most-abundant ceramic types (Fish 1971; Huckell 1973; Weed 1972). Architecture, burial patterns, and items of material culture suggested a typical Hohokam occupation, except for the abundance of Wingfield plain. Recognizing the abundance of this local plain ware, Weed (1972:77–78) was among the first to suggest that the analysis of plain ware attributes might be useful for chronological purposes, an approach that became an important component of future chronological research in the Hohokam northern periphery (see Doyel and Elson 1985a; Weaver 1974; Whittlesey 1998). Weed (1972:92) argued that the evidence from the Beardsley Canal site indicated the Hohokam expansion out of the Salt River Valley into the Agua Fria valley near the end of the Pioneer period, as well as the Hohokam withdrawal from this region near the end of the Sedentary period.

In the late 1970s and early 1980s, ASU conducted a study of several thousand acres around Lake Pleasant as part of Central Arizona Water Control Study (Lerner 1980). The work included records searches, sample survey, and intensive survey. ASU surveyed 1,080 acres as part of the sample survey in the Waddell area in 1979 and documented three sites. The New Waddell Dam on the Agua Fria River was selected as one of many project alternatives, and all areas to be impacted by construction or inundated by water were surveyed.

The 1980 survey of the Waddell Dam vicinity covered 13,184 acres (Lerner 1980). Additional collections were also made at the Beardsley Canal site. Sixty-seven prehistoric sites were recorded, including 19 limited-activity sites, 19 pit house villages, 20 1–20 room habitations, two 21–100 room habitations, 4 petroglyphs, and 3 agricultural sites. Most of these sites south of Lake Pleasant were affiliated with the Hohokam, and more than half were habitations (Green 1986:15–17).

The Phoenix City Streams Project was conducted within 10 km of the New River Borrow Area to plan for flood-control developments along the Agua Fria, Skunk Creek, and Cave Creek drainages (Dittert 1976). ASU completed the first phase with a literature search. They identified only one site along the Agua Fria portion of the project, from the confluence with New River to its termination at the Gila River (AZ T:11:3 [ASU]) (Dittert 1976). MNA conducted the testing phase (Ciolek-Torrello 1981, 1982), and SSI performed additional testing on 30 sites and data recovery on 20 of them within the New River drainage. The New River Dam Archaeological District was established in 1975, about 24 km northeast of LAFB (Doyel 1984; Doyel and Elson 1984, 1985a; Elson et al. 1985) (see Figure 2). The largest habitation site in the USACE New River study area, the Antelope Glyph site, was one of the sites extensively excavated by SSI (Doyel and Elson 1985a). The site had been previously tested by MNA (Ciolek-Torrello 1981) and was investigated by ASU in 1973 (Brown 1976). There were at least 9 pit houses, 6 trash mounds, 3 cobble-structure outlines, 29 petroglyphs, 23 ground-stone-manufacturing loci, 2 possible roasting pits, and 2 agricultural field systems within a 670,000-m^2 area. Additional agricultural fields were recorded about 0.5 km to the east at AZ T:4:13 (ASM). SSI suggested that the New River drainage settlement system focused on the Palo Verde Ruins, a large unexcavated site to the south and outside their study area. The Beardsley Canal site may have served a similar function in the Agua Fria drainage (Doyel and Elson 1985a; Green 1986:17).

In the mid–late 1980s, Archaeological Consulting Services (ACS) performed survey and data recovery in the Agua Fria and New River Borrow Areas in preparation for construction of the New Waddell Dam (Green and Effland 1985). ACS documented 27 sites and over 1,700 isolated artifacts in 2,075 acres for the Agua Fria Borrow Area (including the Waddell Canal). Of interest were 14 ground-stone-manufacturing loci in the second terrace above the river and many tabular and primary-flake knives, possibly associated with agave cultivation. Agricultural fields had fewer linear borders than along New River, but the number of rock piles was high. AZ T:3:9 (ASM) is one example of an unusual agricultural site with border gardens similar to those found by Spoerl and Gumerman (1984) in the Central Arizona Ecotone Project study on the upstream area of the Agua Fria. Habitation sites were abundant and may represent seasonal occupations. These sites were typically small with a single cobble room or a small number of pit houses. No features such as ball courts, platform mounds, or irrigation canals were documented. ACS documented 9 sites and 233 isolated artifacts in the 2,341-acre New River Borrow Area (Green 1986). Of note were two large (greater than 30-acre) agricultural field systems along the river, with multiple linear borders and rock piles. In contrast with the Agua Fria survey area, habitation sites, ground stone manufacture, and agave tools were largely lacking (Green 1986:18). ACS later completed data recovery at 17 sites during the New Waddell Dam Borrow Areas Mitigative Data Recovery Project (Green 1989). The sites included large agricultural fields, sometimes with associated surface masonry field houses, farmsteads with a few pit houses, resource-procurement and -processing sites, and a single special-purpose crematory site.

The White Tank Mountains

Another area near LAFB with extensive archaeological work is the White Tank Mountains, located approximately 12 km west of the base (see Figure 2). A number of small and large surveys were conducted on the southeastern flanks of this range. In 1963, the White Tank Mountain Regional Park, just west of the project area, was surveyed by the ASM as part of a larger survey of five regional parks in Maricopa County. Johnson (1963:20–27) located 11 sites consisting of a rockshelter, 2 sherd scatters, and 8 villages of various sizes, some associated with surface architecture and petroglyphs. Johnson attributed all of the sites to the Hohokam culture on the basis of the ceramics and suggested that the area was occupied between A.D. 500 and 1100, although the main occupation occurred between A.D. 700 and 1100. In 1977, Archaeological research

Services (ARS) conducted a sample survey for Caterpillar Tractor Company (Yablon 1978) as part of a land exchange with the Arizona State Land Department. Only areas of likely habitation were checked, and seven sites were documented: the historical-period P. W. Litchfield cabin (AZ T:6:1 [ARS]), a prehistoric rock-shelter/petroglyph site (AZ T:6:2 [ARS]), two petroglyph sites (AZ T:6:3 [ARS] and AZ T:10:1 [ARS]), two sherd scatters (AZ T:10:2 [ARS] and AZ T:10:4 [ARS]), and a historical-period mine shaft (AZ T:10:3 [ARS]). Three small surveys were conducted along the western fringe of the White Tank Mountains that did not identify any sites (Adams 1995; Breternitz 2004:1.15–1.17; Rosenberg 1982, 1984). Breternitz (2004:1.17–1.18) also identified six additional sites in his prefield research for the Verrado project. Most of these sites were small campsites or artifact scatters, although AZ T:10:13 (ASM) was identified as post-Classic Hohokam or Yavapai, and AZ T:10:15 (ASM) and AZ T:10:23 (ASM) were considered Yuman and historical-period Yuman, respectively.

In 1998, SSI began a long-term study for the Verrado master-planned community (formerly the Caterpillar Proving Grounds) in the southeastern White Tank Mountains. SSI intensively surveyed 6,020 acres and identified 48 sites along the drainages going into the mountains, 33 of which were later test excavated (Breternitz 2004; Ellis et al. 2001). These sites included several rockshelters, located in cavities formed in the banks of washes, and small habitation sites. In the mountains, roasting pits and petroglyphs were found. On the intervening *bajada*, SSI found several small rock-lined, oval- and boat-shaped ball courts. One of these features was located in a wash. The chronology of the area appears to correspond with the findings from other studies in the region. Breternitz (2004) has suggested that there is little evidence of Classic period occupation, with the bulk of the occupation dating to the late Colonial and Sedentary periods. Like elsewhere in the region, Hohokam Buff Ware was the dominant decorated ware in the sites investigated by SSI; however, a Little Colorado White Ware was also present.

In 2000, SWCA conducted a 3,343-acre survey between the White Tank Mountain Regional Park and Trilby Wash (Potter and Garrotto 2000). In total, 26 prehistoric sites were identified, including one site (AZ T:7:202 [ASM]) with a possible rock-lined ball court. The survey had high frequencies of Hohokam ceramics, leading Potter (2002:200) to speculate that most of the activities in this area are associated with pre-Classic Hohokam habitation, water collection, and probably hunting and plant collecting. Little evidence of flaked or ground stone manufacture was evident.

To the north of the White Tank Mountains, archaeological survey and mitigation took place for Reaches 7–9 of the Granite Reef Aqueduct project, undertaken as part of the Central Arizona Project (Brown and Stone 1982). These canal sections run from the Hassayampa River, northeast of the White Tank Mountains, east to the Agua Fria River, and northeast to Lake Pleasant. Twelve archaeological sites were recorded along this alignment, including artifact scatters (some with rock-ring features or rock clusters), a flaked stone scatter, a water- or soil-control linear rock alignment with ceramics, and a possible historical-period homestead. The sites with ceramics were dominated by Hohokam wares, but some Lower Colorado Buff Ware artifacts were also noted (Bauer et al. 1995:10).

LAFB and Immediate Vicinity

Three archaeological surveys were completed in the immediate vicinity of LAFB that resulted in the complete inventory of the MSA project area (see Chapter 1, this volume). Cultural and Environmental Systems, Inc. (CES), conducted an intensive archaeological survey of 435 acres adjacent to LAFB in 1990 (Slawson and Maldonado 1990). The project area consisted of two parcels, one directly south of the base and the other 2 miles to the east. Two sites, AZ T:7:47 (ASM) and AZ T:7:48 (ASM) were recorded in the parcel adjacent to the base. Thirty-one isolated artifacts were also found, including flaked stone artifacts, plain ware ceramics, thermal features, historical-period trash, and ground stone artifacts. AZ T:7:47 (ASM) is a prehistoric artifact scatter containing approximately 200 artifacts. The site measures 180 by 130 m and contains mostly flaked and ground stone artifacts, along with 6 sherds. Based on the analysis of a collected projectile point and the small number of ceramic artifacts, Slawson and Maldonado (1990) concluded that the site dates to the Archaic period. AZ T:7:48 (ASM) is a historical-period site. It measures 400 by 300 m and contains

3 structure foundations, 2 wells, 6 trash dumps, 1 stock tank, 1 fish pond, and 1 stepped line of salt cedar trees (Slawson and Maldonado 1990:5). CES recorded 6 prehistoric isolated artifacts at the site.

In 1991, ACS conducted a survey of 440 acres directly south of LAFB (Adams 1991), including a resurvey of a portion of the CES inventory. ACS recorded one new prehistoric site (AZ T:7:68 [ASM]), 74 isolated artifacts (or isolated groups of artifacts), and revisited a previously recorded prehistoric site (AZ T:7:47 [ASM]). AZ T:7:68 (ASM), measuring 700 by 350 m, is a large prehistoric site composed of "a series of artifact scatters of varying density, with three areas of relatively high artifact density (Loci 1–3). Also present are several concentrations of burned and unburned local rock (designated A and B in Locus 1)" (Adams 1991:4). Of the 74 isolated artifact groups, 55 contain flaked stone artifacts, 8 contain ground stone artifacts, 5 consist of both flaked and ground stone artifacts, 5 consist of ceramic artifacts, and 1 has both flaked stone and ceramic artifacts. No historical-period isolated artifacts were recorded. Most of the flaked stone isolated artifacts were made from basalt, although some were made from quartzite, rhyolite, chert, chalcedony, andesite, and dacite. The sherds were all identified as plain ware.

SRI completed an intensive inventory, mostly resurvey, of 275 acres between the two areas previously surveyed by CES and ACS in 2003 (Tagg 2008; Tagg et al. 2007). They recorded seven new sites (Luke 03A-01–Luke 03A-06 and Luke 03A-08) and 50 isolated artifacts and rerecorded AZ T:7:47 (ASM) and AZ T:7:48 (ASM). The isolated finds include flaked stone artifacts (n = 13), a combination of flaked stone and ground stone artifacts (n = 13), a combination of ceramic and flaked stone and/or ground stone artifacts (n = 11), ceramics (n = 8), historical-period artifacts (n = 4), and ground stone (n = 1). The ceramic artifacts are affiliated with the Gila–Salt Basin Hohokam. The nine sites include seven prehistoric artifact scatters (Luke 03A-01–Luke 03A-06 and AZ T:7:47 [ASM]) and two historical-period artifacts scatters (Luke 03A-08 and AZ T:7:48 [ASM]; the latter had features). The prehistoric sites consist primarily of flaked stone artifacts, although all have ground stone and ceramic artifacts, and shell is present at one site (Luke 03A-01). They are all affiliated with the Gila–Salt Basin Hohokam, based on associated ceramic artifacts and projectile points. Three sites (Luke 03A-03–Luke 03A-05) date to the Sedentary or Classic periods, based on a Classic Triangular projectile point (Luke 03A-03) and Sacaton Red-on-buff ceramic artifacts (Luke 03A-04 and Luke 03A-05). The remainder either have unidentifiable buff ware; red-on-buff; Gila Plain, Salt Variety; or Gila Plain, Gila Variety ceramics and could not be placed more accurately in time. Luke 03A-03 also had a possible Pinto point, associated with the Middle Archaic period, and a point only identified as Archaic period was reported during the original documentation of AZ T:7:47 (ASM). The two historical-period sites, Luke 03A-08 and AZ T:7:48 (ASM), may be the remains of early homesteads in the area. Luke 03A-08 is a heavily disturbed artifact scatter that possibly represents the Teddy Louis Pemma homestead (from ca. 1918 to early 1940s) (Tagg et al. 2007:56). AZ T:7:48 (ASM) is a large artifact scatter with 13 features that slightly overlapped into the SRI survey area. It might represent the Jesse K. McDonald homestead (ca. late 1920s–early 1950s) (Tagg et al. 2007:63).

In 2005, ARS completed a 172-acre survey located west of Litchfield Road (Wright 2005), including a portion of what is now LAFB, south of Super Sabre Street. Wright (2005) rerecorded AZ T:7:48 (ASM), expanding its boundary, and identified a new site, AZ T:7:351 (ASM). AZ T:7:351 (ASM) consists of at least 12 roasting pit features and an artifact scatter. The roasting pits are characterized by clusters of a few to over 100 pieces of FAR. The upper portions of the features were exposed in low-lying, deflated areas. The presence of Hohokam plain ware ceramics led Wright (2005:14) to interpret AZ T:7:351 (ASM) as a Hohokam occupation, and the likelihood of buried subsurface components was considered to be high.

Research Themes

SRI used three broad research themes to investigate the data obtained from fieldwork and guide postfield analyses: chronology, cultural affiliation, and land-use patterns. These research themes are applicable to understanding Middle Archaic, Late Archaic/Early Agricultural, and the later Hohokam occupations within the project area and within the Phoenix Basin and the U.S. Southwest more generally. Central to this research strategy was to examine how peoples who occupied the project area in the past lived within both the natural and sociocultural environments over time. Using the research design presented here, we examined settlement, subsistence pursuits, technology, and social relations at the project sites during the Middle Archaic, Late Archaic/Early Agricultural, pre-Classic, and historical periods.

The previous surveys of LAFB and the surrounding area, mentioned above, did not adequately identify the potential of Archaic occupations. The full breadth and extent of the Archaic occupation was not realized until the Luke Solar project excavations. Ultimately, this project provided a valuable opportunity to examine the Middle and Late Archaic periods and the Neolithic Revolution in the U.S. Southwest that will find broad relevance for current anthropological and archaeological inquiries focusing on these critical periods and events in human history.

Chronology

Archaeological studies require placing sites, site components, and features within a temporal framework. This framework then allows archaeologists to study how material culture may have changed over time. Chronology is of particular importance when studying the western Phoenix Basin, because although the area was central to the history of Hohokam cultures in the region, it has not seen the same frequency or intensity of archaeological investigations as other areas in the region and the state (e.g., the central Phoenix Basin, the Middle Santa Cruz River, and the Four Corners region). Even less is known of the Middle Archaic and Late Archaic/Early Agricultural period and Early Ceramic prehistory of the western Phoenix Basin. As a result, chronology was a crucial component of our work and interpretations.

Chronological analyses can involve a variety of scales. On the regional level, it is necessary for sites to be placed within the existing cultural-historical framework. Once the temporal phase and range of dates of occupation have been established, refinements can be made to existing cultural-historical frameworks. Thus, any data that helps to place sites within the temporal framework are important. At the site level, it is important to determine whether sites represent single or multiple components and to determine whether it is likely that subsurface cultural manifestations associated with the components are present. It is also crucial to determine whether the various occupations were sequential or if they overlapped in time and to estimate occupational duration and intensity. At the intrasite level, it may be necessary to date features and to determine the temporal relationships among the features.

Concerns regarding this research theme can be viewed as substantive and methodological. On the one hand, many important research issues hinge on well-defined temporal parameters. For example, timing is critical to understanding whether or not the Hohokam culture was the product of population movements or an indigenous development and to assessing the relationships between Archaic and Hohokam groups of central Arizona. Methodological concerns should not be separated from such research issues. For instance, many prehistoric sites in central Arizona are surface artifact scatters that lack temporally diagnostic artifacts and datable material. Artifact scatters, flaked stone scatters, and resource-procurement and -processing sites may be found. Multiple visits to such sites by prehistoric people over long periods may be collapsed together in the archaeological record. Relatively low population density during the Archaic period also probably contributed to the overall low visibility of such sites; small groups had little impact on the land and left few artifacts behind. Unfortunately, these are the most difficult of all archaeological contexts to date and interpret. Without relative or direct dating techniques, it can be difficult to determine whether sites or features date back several thousand years or if they reflect a more recent occupation.

There is a crucial need for better means of chronological control, including obtaining diagnostic temporal markers such as projectile-points, ceramics, and architectural styles. Although cross-dated painted ceramics from the Phoenix Basin Hohokam can certainly assist in temporal control, there are also issues in using pottery for dating. In particular, the gaps in our chronological knowledge of the area are likely not to be resolved through more cross dating of locally or nonlocally produced ceramics. Using cross-dated ceramics cannot help us to determine whether these gaps are the results of our methods or representations of real occupational hiatuses in the area. Archaeologists need to seek other ways of dating sites, artifacts, and deposits. Increased and sustained efforts toward obtaining absolute dates through traditional means, such as radiocarbon or archaeomagnetic techniques, must be undertaken by researchers in the area. In addition, we must evaluate the efficacy of alternative dating techniques, such as obsidian hydration or thermoluminescence, and apply these techniques to flaked stone and ceramic artifacts that are often found on the surfaces of sites. Due to the significant and substantial Archaic occupation in the Luke Solar project area, the following research themes are focused on this occupation.

Questions that can be asked concerning chronology include the following:

1. What is the occupational history of the project sites? Did site size, composition, affiliation, and site function change over time?

2. What portions of local, regional, and panregional (U.S. Southwest and West) chronological sequences are represented at the sites?

3. How can the project sites yield chronological information that can begin to “fill in the gaps” in our knowledge of the culture history of the Phoenix Basin, particularly those related to the Middle and Late Archaic/Early Agricultural and Early Ceramic periods?

4. What are the relationships between the age of the site components, the evolution of the landform, and the stratification of archaeological features?

5. How can settlement structure represented by house groups and clusters of extramural pits inform on site chronology?

6. Is there evidence for a continuity of occupation from the Middle Archaic through the Hohokam or Protohistoric occupation of the region? Are there occupational hiatuses, and if so, how long did they last and why did they occur?

Cultural Affiliation

Cultural affiliation and related issues—such as ethnic identity and coresidence, the relationships among peoples of different cultures or social groups, and the kinds and frequencies of social relations—do not exist in a historical vacuum. Particular sets of relationships and cultural affiliations are embedded in specific histories. For central Arizona, it is of particular importance to understand how the local Hohokam tradition developed from those of the Middle Archaic, Late Archaic/Early Agricultural, and Early Ceramic periods. The preliminary radiocarbon dates obtained during our Phase 1 investigations (see Chapter 1, this volume) suggest the project sites were occupied, likely on a seasonal basis. We believe that a greater understanding of the social and cultural expression of these periods in this historical sequence is a critical component to our overall understanding of the past in this part of Arizona.

As we discussed briefly above, archaeological investigations in central and southern Arizona have played an important role in our understanding of several of the major archaeological cultures or traditions of the U.S. Southwest; particularly, the Middle Archaic period and Late Archaic/Early Agricultural period traditions, as well as the Hohokam archaeological culture. Middle Archaic period traditions and complexes in south and central Arizona are generally poorly understood, and this project has provided an opportunity to reexamine the usefulness of concepts such as the Cochise Culture (Sayles and Antevs 1941; see also Eddy and Cooley 1983), the Amargosa Culture (Rogers 1939), the Desert Culture (Jennings 1953, 1957), the Picosa-Oshara tradition (Irwin-Williams 1967, 1973), and overall panregional trends in desert regions in the U.S. West (e.g., the Sonoran, Mohave, Chihuahuan, and southern Great Basin deserts). A panregional perspective is likely most aptly applied to the Middle Archaic period components at LAFB, given that very few Middle

Archaic period data sets have been reported in Arizona and a broader cultural and geographic perspective will likely be required to gather enough meaningful comparative information to interpret the LAFB findings properly. Furthermore, Huckell (1984) and Bayham et al. (1986) have argued that traditional regional concepts of the Archaic period (i.e., Cochise and Amargosa) are best abandoned, and they view the Archaic period as a widespread post-Pleistocene hunting-gathering adaptation that exhibits diachronic variability in artifact assemblages, mobility, land use, and sociocultural complexity. The Luke Solar project provides a vehicle for furthering these discussions and our understanding of Archaic period lifeways and peoples.

During the latter part of the first millennium A.D., traits from the Hohokam culture area mixed with material culture derived from and influenced by the nearby Patayan and Yuman cultures to the west. Evidence of Yuman occupation has been suggested at several Hohokam sites in the lower Salt River Valley, based on the presence of Lower Colorado Buff Ware. These ceramics were produced between A.D. 700 and 1000 in western Arizona and southern California, including the Colorado River and lower Gila River areas (Waters 1982:275). Their presence has important implications for interregional interaction, trade, and cultural affiliation. Low frequencies of Lower Colorado Buff Ware were recovered at AZ T:11:94 (ASM) near the confluence of the Salt and Gila Rivers (Beck 2005; Garraty et al. 2009), as well as at several sites in the nearby Cashion Ruin complex (Antieau 1981; Leck 2007). These ceramics were also abundant in one locus of Los Colinas, suggesting the presence of a residential ward occupied by Yuman immigrants in the downtown Phoenix area (Beckwith 1988). Later in time, Salado or Sinaguan material traits are common in the area, a similar pattern to many other regions throughout the Sonoran Desert and central Arizona.

Archaeologists, in practice, tend to view archaeological cultures as proxies of actual past cultural groups or phenomena. For central Arizona, the blending of traits from different archaeological phenomena strongly suggests a dynamic past cultural landscape wherein cultural traits and perhaps different peoples coexisted in a complex cultural and historical situation. For example, the change in living arrangements from pit houses and courtyard groups to aboveground adobe structures and walled compounds indicates a radical change in domestic organization. Similarly, changes in public architecture, with the introduction of platform mounds throughout the Phoenix Basin ca. A.D. 1300, likely marks a subsequent and considerable change in peoples' cultural identities and their social relations. Given the history of these changes in central Arizona, we believe that the cultural affiliations and webs of social relations within which people existed in the past are an important component of our understanding of past cultural processes in this area.

Archaeologists have traditionally used particular technologies and styles as indicators of cultural traditions. Analyses of technology and style can potentially identify the attributes that result primarily from purely environmental or historical considerations and those that may be culturally based. The material bias of the discipline of archaeology has necessarily required us to rely more heavily on ceramics, projectile points, and other items of material culture than on less-tangible or more-perishable markers of cultural affiliation. Language, for example, was perhaps the only reliable way to differentiate among different ethnic groups in the past (*sensu* Shaul and Hill 1998); however, it leaves no visible traces in the archaeological record. Clothing and personal adornments can provide a method of determining cultural affiliation, but it can also be difficult to obtain from nonburial contexts in the archaeological record. Subsistence practices and settlement patterning may hold considerable promise as ways to identify cultures, but this remains an open issue in central Arizona—one to be resolved with specific data collection and analysis.

Questions that can be asked concerning the theme of cultural affiliation include the following:

1. What archaeological cultures or traditions are represented by the material culture, architecture, technology, and mortuary practices exhibited at the project sites? How might these cultures or traditions relate to past cultural patterns?

2. Is there evidence of interaction, coresidence, or blending between the residents of the project sites and the inhabitants of the lower Salt and middle Gila Rivers, the Agua Fria and New River drainages, or the lower Colorado River? Are the sites in the project area affiliated with previously documented regional Archaic period traditions (e.g., Cochise) or a more generalize panregional pattern (e.g., U.S. Southwest

or Western Archaic period). Were the Ceramic period site occupants affiliated with the nearby Hohokam core area or with other, neighboring groups?

3. How do cultural affiliation and chronology correlate in the prehistoric period? Is there any indication of replacement of one group by another during periods of significant changes in material culture (e.g., between the Middle Archaic, Late Archaic/Early Agricultural, Early Ceramic, Hohokam, and O'odham groups)? If so, when and how did this take place? Alternatively, do the project data suggest a continuity of occupation with gradual changes in material culture, technology, and land use?

Land-Use Patterns

Archaeologists are always interested in how people adapt to their physical and biological environments, use their resources for diverse purposes, and arrange themselves across the landscape in the course of their lives. Land-use practices are a basic archaeological research concern. As people inhabit an area, they interact with the land in a variety of ways, many of which leave physical traces. Land-use patterns can be correlated with temporal information, cultural affiliation and ethnicity, and social organization to shape a broad picture of regional patterns in both the prehistoric and historical periods.

A fundamental unit of analysis for this human-environmental interaction and patterning during prehistoric times is the household (Ashmore and Wilk 1988; Netting et al. 1984; Wilk and Netting 1984; Wilk and Rathje 1982). Although the ethnological and archaeological definitions of households and household groups and units differ in emphasis (Kramer 1982), the household is the most fundamental spatial/activity unit of human societies. It is responsive to social, economic, physical and political change and it functions as a unit of adaptation (Flannery 1972, 2002). By studying the household through time and space, it can be used as a measure of cultural change and an indicator of social norms. The best way to obtain information on daily life in prehistoric societies is to excavate the remains of houses and their contents—the material correlates of the household. Although the relationship between houses and households may or may not be one-to-one, analyzing the spatial and social organization of household units (houses and associated intramural and extramural features) allows us to understand this correlation. To avoid thinking about households as simply the remains of material goods that might be excavated, it is helpful to think about households as spheres of activities—that is, view them based on what households "do" (Ashmore and Wilk 1988:4–5; Douglass and Gonlin 2012; Wilk and Netting 1984:5–6). In this way, a household can be viewed as an activity area (Ashmore and Wilk 1988:3). More specifically, Wilk (1991:Chapter 3) has argued that a household can most readily be functionally defined as the maximal overlap of activities, including the physical shelter, which is generally viewed as a mediating factor for social relationships between household members. Households also change in response to numerous factors, including demography and economy.

Settlement and subsistence practices are also integral facets of land-use patterns and historically have been popular research interests in American archaeology. Determining how individuals and households functioned economically, how different subsistence practices contributed to the total economy, and how households and larger communities moved across the land in the course of their daily activities are particularly significant topics. Settlement and subsistence systems in central Arizona were based on hunting, foraging, collecting, agriculture, and industry (or various combinations thereof) across time and space. During the prehistoric period, logistically organized food-procurement parties may have moved peripherally around winter base camps to exploit specific resources (*sensu* Binford 1980). This would have been particularly important for the dry, late-winter and early-spring months, when fewer resources were available. These strategies likely shifted with household size and composition and in response to local environmental conditions and other variables. Settlement and subsistence patterns can be reconstructed from site distributions, occupational site histories, and site characteristics. For example, do the project-area sites represent base camps used by relatively mobile foragers, or do they have features and facilities that suggest long-term, agriculturally based occupation?

The Phoenix Basin and surrounding uplands consist primarily of Sonoran desertscrub flanked by oak-, mesquite-, and evergreen-covered higher elevations. This contrast in elevation and plant and biotic communities certainly structured human uses of the region, and it provides the setting for potential models for understanding adaptation. In this area, archaeologists are confronted not only with two basic environments—uplands and lowlands—but with potential occupation and use by a diverse number of human groups. The overall structure—broad, northwest-southeast-trending basins flanked by uplands of varying elevation and size—of the Basin and Range Province, of which central Arizona is a part, may have fostered population movements and interactions inside and outside the local area and contributed to the pattern of characteristics that is reflected in the local archaeological record. How different people used the land changed dramatically through time. An important part of local and regional settlement analyses is linking landforms, hydrologic and soil information, and other environmental data to site types and inferred functions.

Much of the past in central Arizona is a history of hunting-and-gathering or foraging adaptations. Archaeologists have tended to map ethnographic accounts of logistically mobile, hunting-foraging households and larger communities onto the prehistoric past (Doelle 1980) or have attempted to reconcile disparities between the ethnographic and archaeological records (see Whittlesey and Benaron 1997). Although ethnographic accounts can provide useful models, it is important to consider possibilities not recorded in the ethnographic literature. Local adaptations, territory establishment and maintenance, changes in mobility and in settlement and subsistence strategies over time, as well as the role of trade in the local economy are important topics. For example, do differences between upland and lowland sites of the same time period represent specialization into ecological niches by a single cultural group or distinctive adaptations by different groups?

Several settlement and subsistence strategies may have been used in the distant past by hunter-gatherers in central Arizona. One strategy is based on a model borrowed from the ethnographic present—an annual round centered on storable upland resources that mature in the fall and the use of lowland resources in the spring and summer. This view of dual upland-lowland use (seasonal movement) by a single prehistoric people has persisted throughout most archaeological interpretations of not only Arizona prehistory but of foragers and agriculturists, in general.

Another important topic within this theme is agriculture. When was it introduced into the region? What factors promoted the adoption of cultivated plants? How has climate change affected the introduction and use of domesticated plants? Were certain groups preconditioned, so to speak, to accept agriculture, by virtue of their preexisting subsistence practices? What role does environment play in the degree to which people can depend upon agriculture? What were household subsistence strategies and how did they involve cultivation? Was cultivation of crops an individual household strategy or did it involve suprahousehold economic or social organization? Finally, what impact did the advent of agriculture have on the use of the project area, if any?

Questions concerning land-use practices include the following:

1. What activities occurred at the respective sites? Do individual site components represent resource-procurement staging and processing locales, short-term encampments, seasonal habitations, long-term habitations, or special-purpose settlements?

2. Is there evidence of agriculture? For example, are any agricultural features present, such as water-control features, reservoirs, canals, or fields? Is there evidence of early agriculture in the form of early cultigens or agricultural features among the project sites? If so, how does it compare with the Early Agricultural period sites documented along the Middle Santa Cruz River in Tucson (e.g., see Gregory 1999b, 2001a; Mabry 1998, 2008; Whittlesey et al. 2010)?

3. What were the functions of features found at the sites? Are storage or caching facilities present? Can specific functional and social differences be attributed to the architectural variability exhibited among the sites and occupational components? How does such potential variability compare with that documented along the Middle Santa Cruz River (e.g., see Gregory 1999b, 2001a; Mabry 1998, 2008; Whittlesey et al. 2010), Middle Gila River (Clark 2000), and the few nonriverine Late Archaic/Early Agricultural period settlements reported along the Santa Cruz Flats (Halbirt and Henderson 1993) and along the Middle Queen Creek drainage (Wegener and Ciolek-Torello 2011; Wegener, Heilen, et al. 2011)?

4. What relationships, if any, are there among activities carried out, season of occupation or use, and duration or intensity of occupation or use? Did these activities change through time?

5. Which components of past subsistence systems (e.g., hunting, gathering, or farming) are represented at the project sites? Can the most important procurement strategies and resources be identified?

6. What environmental variables (e.g., topography, soils, water sources, vegetation, and climate) can be correlated with site activities and practices?

7. How do changes in settlement and subsistence relate to geomorphic or climatic changes?

8. What are the relationships among activities, site function, and time? Is there evidence of household, social, or economic differentiation through time? Did household, suprahousehold, and site functions remain constant or change over time? For example, how do the size and structure of Archaic and Early Ceramic period households compare to the well-documented Hohokam household organization? Were the sites occupied by household groups or some other social unit? What activities did they undertake at the sites?

CHAPTER 3

Methods

Mitchell A. Keur and John D. Hall

An archaeological investigation of the size and scope of the Luke Solar project required materials, equipment, procedures, and information management beyond what is typically expected in data-collection efforts. Indeed, logistical challenges were aggravated by the need to maintain consistency in the type and quality of data collected, especially in an atmosphere of evolving resources and timelines. The field methods SRI employed on the Luke Solar project were developed based on past experience and our institutional understanding of large-scale data recovery projects, with appropriate mindfulness of the need for flexibility. This chapter serves to familiarize the reader with the data we sought and the manner in which we captured them. The results of these endeavors appear elsewhere in this volume, and the reader is encouraged to reference these methods throughout the results sections of this report.

Provenience-Designation System

The collection and management of spatial and aspatial information is of paramount importance in any archaeological investigation. Over time and through many successful archaeological field projects, SRI has perfected a system for capturing and organizing such data. The provenience-designation system is a mechanism by which data are assigned to an information-management framework with an emphasis on relationships among all types of data, from field observations to laboratory analyses. The key to this system is the provenience-designation number. This number is principally assigned to a meaningful cultural or arbitrary space, such as a map nail, a feature boundary, or a volume of sediment. Provenience-designation numbers are managed through a provenience log, from which numbers are assigned consecutively and uniquely, by archaeological site. Each provenience-designation number is encoded with a substantial amount of information about the space being defined, such as its relationship to cultural features, its relationship to arbitrary horizontal and vertical spatial units, the manner in which the space is investigated, and its relationship to natural and cultural stratigraphy. In short, each provenience-designation number represents a set of data that corresponds to both cultural and investigative attributes of a particular project site. The adaptability and durability of the provenience-designation system allows for the collection of spatial and aspatial data within a framework that can accommodate any cultural and analytical context.

Cartography

SRI's Department of Cartography and Geospatial Technologies (CAGST) was responsible for maintaining control and documentation of spatial locations for all archaeological fieldwork activities. CAGST was tasked with establishing site datums, managing spatial data, rectifying and digitizing field maps, and creating all field and report maps.

At the beginning of the project, three control points were established by a static Global Positioning System (GPS) survey with an Ashtech ProMark2 L1 antenna system. The control points were corrected using least-square adjustment analysis. Throughout the project, these three control points were used to establish additional datums within the project area. Once control was established, all spatial and elevation data for each site were acquired with a Sokkia Set 5 total station, using a Panasonic Toughbook laptop computer and PenMap software. All total-station point data were collected with horizontal and vertical accuracy within 3 cm. Every total-station point received the provenience-designation number associated with the unit, artifact, feature, or map nail being mapped. If multiple shots were needed for a single unit or feature, multiple shots received the same provenience-designation number, and these multiple shots established a closed polygon around the unit or feature. The total-station data were exported from PenMap as ".dat" files and placed in the project folder.

The SRI relational database (SRID) Geographic Information Systems (GIS) Data Editor is a customized GIS data-entry application used to convert total-station point data to polygons and link them to descriptive database attributes. The GIS Data Editor was upgraded to be compatible with Esri ArcGIS v. 10. CAGST used this application to facilitate semi-automated polygon creation and entry of GIS data in ArcSDE in a manner that ensured compatibility and easy integration with aspatial data stored in SRID. SRID GIS Editor works by matching the unique hexadecimal code associated with the provenience in SRID to the unique hexadecimal code associated with GIS attributes, to create a one-to-one relationship between spatial and aspatial data.

Mapping efforts were guided by the objectives of each phase of the project as well as an overarching need for accurate and precise geospatial information. During Phase 1 efforts, CAGST rerecorded established site boundaries based on surface survey, point-located all surface artifacts and features discovered by field personnel, staked out the locations of mechanical trenches, and total-station-mapped all buried features found in trench walls. Boundaries of Phase 1 stripping units enveloping mechanical trenches were shot with the total station in two steps. First, the extent of the stripping unit corresponding to the modern ground surface was mapped. Then, following mechanical stripping, the boundary at the level of the stripped surface was shot. The difference in elevation, in conjunction with the horizontal boundary, allowed for the calculation of the volume of sediment stripped. Intersite-trenching activities were mapped in the same manner as those during Phase 1: CAGST staked the locations of proposed trenches with Trimble XH GPS receivers, total-station-mapped the resultant trenches, and recorded the locations of features discovered in trench walls.

The CAGST department was also tasked with total-station-mapping of the boundary of every feature discovered during mechanical stripping as well as the final boundary of each manually excavated feature. Arbitrary excavation units and control points, such as test pits, hand trenches (HTs), mapping nails, and vertical control nails, were also total-station-mapped, along with point-located artifacts not suitable for hand-mapping. Total-station-mapping of cultural and arbitrary units allowed for a precise and consistent set of geospatial data.

Phase 1 Data Recovery

Phase 1 data recovery was performed between November 3 and December 2, 2010, and in accordance with an approved data recovery plan (Hall et al. 2010). These efforts included resurveying each of the six previously identified sites in the APE (see Chapter 1) to reevaluate established site boundaries. Additionally, all surface features encountered were documented and mapped, and all surface artifacts were individually point-located and collected. Following the collection of all surface artifacts, a series of 45 backhoe trenches, totaling 3,180 m, was dug among the six sites (Figure 8). Trenches measured approximately 70 cm each in width and were generally dug to a depth of approximately 1.5 m. Each trench was then faced by hand to examine the trench walls for buried features and archaeological materials. Mechanical-stripping units (MSUs) were judgmentally placed based on the presence and attributes of features identified in trench walls. This served to explore the horizontal extent and distribution of features, and to guide preparation of the Phase 2 HPTP (see Hall et al. 2011).

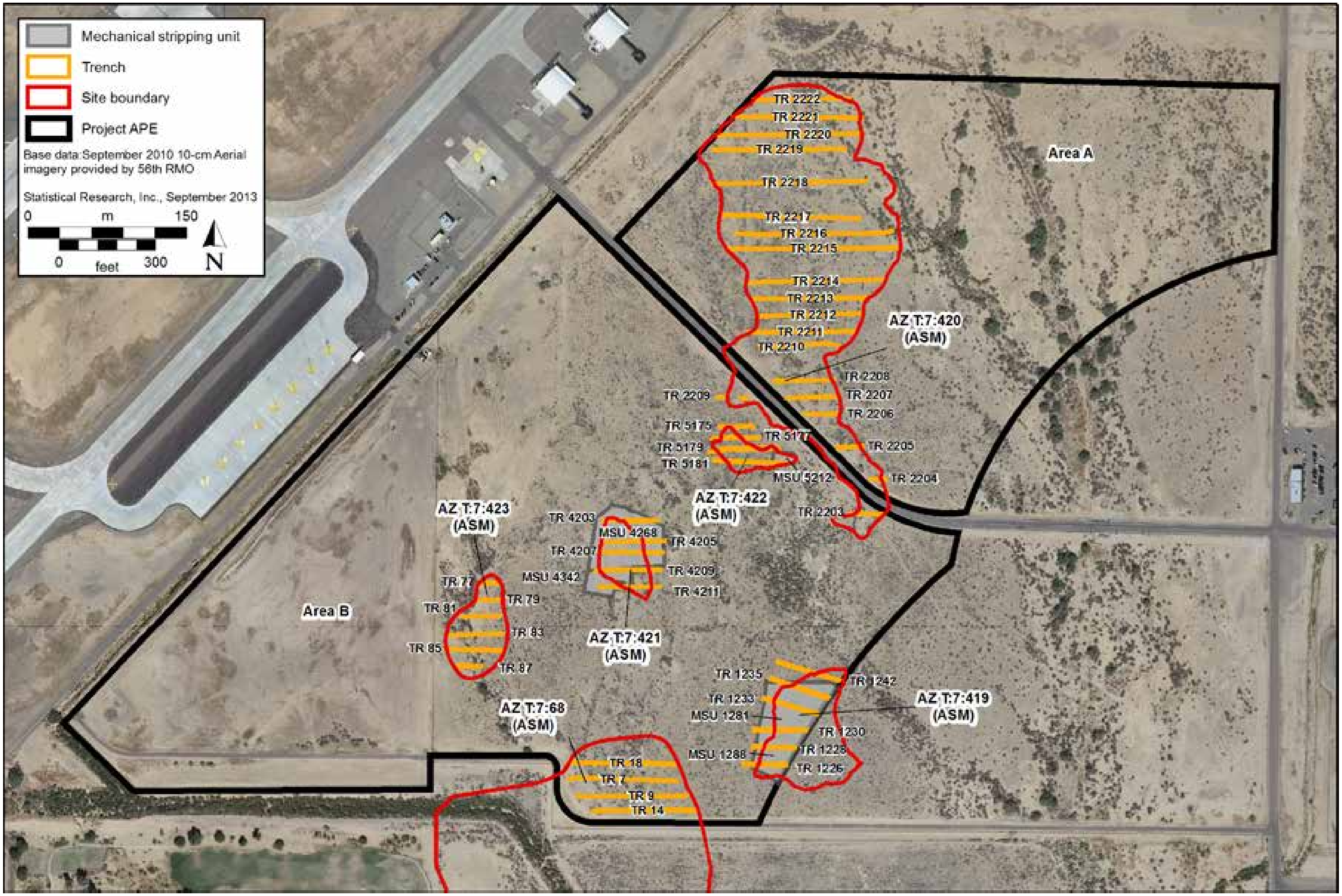

Figure 8. Locations of trenches and MSUs excavated during Phase 1.

The mechanical-trench and, where applicable, mechanical-stripping results are described in subsequent chapters of this volume. It is important to note that the purpose of Phase 1 activities was to assemble a better understanding of the surface and subsurface features within the APE, and to guide Phase 2 data-collection strategies and expectations.

Intersite Trenching

Because our trenching and stripping efforts identified numerous previously unidentified subsurface features, concern was expressed by the SHPO regarding the possible presence of additional subsurface cultural resources outside established site boundaries within the project area. To address this concern, SRI carried out an intersite-trenching program between May 23 and June 9, 2011 (Hall et al. 2010:Addendum B). In total, 83 additional backhoe trenches, totaling 2,166 m, were excavated in various locations throughout the APE, outside the previously identified site boundaries (Figure 9). The goal of digging these additional trenches was to locate—or, conversely, to rule out the possibility of—buried cultural resources beyond established site boundaries. To accomplish this, a strategy was developed in which some of the new trenches would be placed in areas contiguous with site boundaries, to explore the reliability of these boundaries. In other words, trenches were judgmentally placed to determine whether subsurface observations supported or refuted the site boundaries drawn from surface survey and Phase 1 efforts.

The other part of our intersite-trenching strategy was to place trenches randomly outside site boundaries, to serve as a representative sample of the APE. To accomplish the random placement of trenches, a 10-by-10-m grid was overlaid across the APE, corresponding to Universal Transverse Mercator coordinates for ease of navigation with handheld GPS units. The ArcGIS program was then used to buffer all existing archaeological site boundaries and proposed judgmental trenches by 30 m. This buffer ensured that the randomly placed trenches would cover areas of the APE that were not already known to contain archaeological features. Grids with more than 50 percent of their areas outside the perimeter of the APE were excluded. The Hawth's Analysis Tools add-on for ArcGIS was then used to create a random selection of 10-by-10-m grid cells, and each cell chosen in this manner contained a trench alignment. Finally, the newly proposed trenches were digitized in ArcGIS to provide a provisional trench footprint, 20 m long by 70 cm wide for each, to be staked in the field (Hall et al. 2010:Addendum A).

In total, the 83 additional trenches were composed of 33 judgmentally placed trenches and 50 randomly placed trenches. These trench locations were physically staked on-site by CAGST personnel. The trenches were dug by backhoe and were then faced by hand and examined for subsurface cultural resources. All identified features were documented, and their locations were mapped in the same manner as those identified during Phase 1. The excavation of an additional 2,166 m of trench throughout the APE resulted in the identification of 50 additional buried cultural features in 33 of the intersite trenches. Fifty of the intersite trenches did not contain features, and they were mainly located in the northeastern and southwestern portions of the APE (see Figure 9).

Intersite-Trenching Results and Falcon Landing Combination

As noted above, 50 additional buried features were encountered among 33 intersite trenches. The distribution of these features suggested that Sites 419, 420, 421, and 422 were not discrete sites but, rather, all part of the same area of past cultural activity. The distribution of subsurface features within the project APE thus guided our decision to combine Sites 419, 420, 421, and 422 into a single site. Following ASM conventions, the combined sites were given the site number AZ T:7:419 (ASM). A new boundary was drawn to encompass these four sites as a single site (see Figure 22).

Combining the four sites into one presented some project-administration and data-collection challenges. As noted above, the provenience-designation system employed by SRI is constructed on a site-by-site basis. Provenience-designation numbers are nonrepeating within a single site but not across sites. Thus, combining

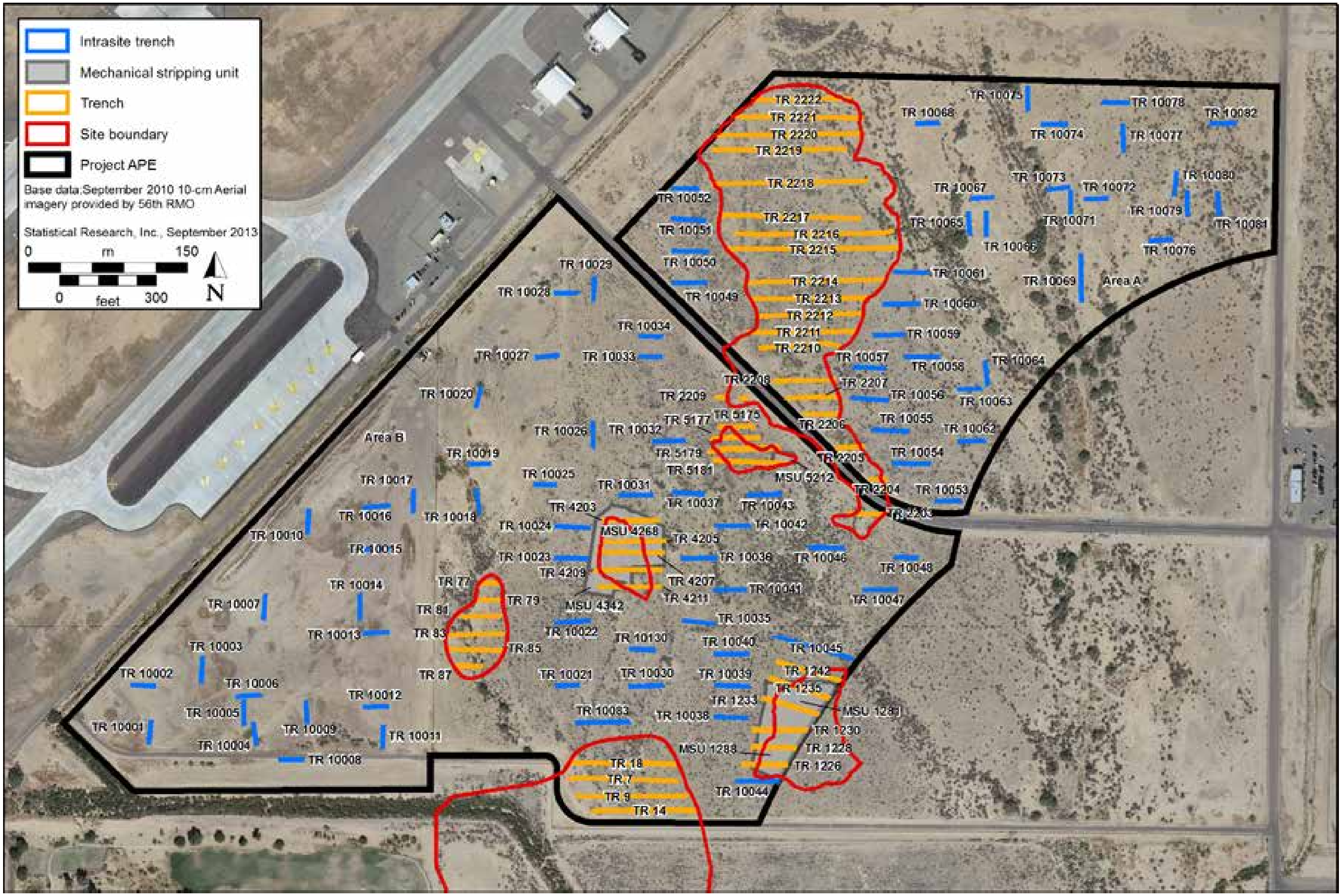

Figure 9. Locations of trenches excavated during intersite trenching.

four sites into one resulted in several repeated provenience-designation numbers. This was addressed by adding prefixes to numbers according to their original site designations. See Chapter 4 of this volume for a discussion of how this was accomplished to include all previous provenience-designation numbers assigned to the old Sites 419, 420, 421, and 422 in the combined site number for Falcon Landing while avoiding repetition.

Phase 2 Data Recovery

Phase 2 data recovery efforts were accomplished during two mobilizations, one from September 19, 2011, to February 9, 2012, and another from November 5, 2012, to April 25, 2013. The field methods for these two mobilizations did not differ in any meaningful way and were guided by the Phase 2 HPTP (Hall et al. 2011). Because the methods, goals, and obligations of Phase 2 activities did not change during the time between mobilizations, they are reported here as a single Phase 2 data recovery effort.

Mechanical Excavations

A 1-acre grid was defined in the project APE to aid mechanical stripping over an estimated 45 acres of the 107-acre APE (Hall et al. 2011). The subsurface components of the sites were spread across a large horizontal area but were relatively shallow and shallowly stratified. Mechanical stripping was the preferred method for removing overburden over a large horizontal area while maintaining close depth control. The size of the project area far exceeded what could practicably be negotiated with a standard backhoe within the available project timetable. To meet this challenge, SRI contracted with Casey's Backhoe Service and secured two 325 Series excavators (trackhoes) equipped with 8-foot-wide mucking buckets for broad, aerial mechanical stripping (Figure 10). Two 550 Series front-end loaders were utilized to remove and stockpile the staggering amount of backdirt generated by the trackhoes. On average, the trackhoes and front-end loaders were able to strip and stockpile approximately 1.5 acres to a depth of 50 cm below the modern surface in a 40-hour work week. Finally, because of Maricopa County Air Quality Department regulations that required constant dust management, as many as four 2,000-gallon water trucks were required on a full-time basis to ensure appropriate dust control.

From September 19, 2011, until February 9, 2012, one trackhoe, one front-end loader, and a water truck were able to strip 15.65 acres (63,327 m^2). When Phase 2 efforts resumed in November 2012, two trackhoes, two front-end loaders, and two water trucks were used for mechanical-stripping activities, and between November 5, 2012, and April 25, 2013, two heavy-equipment teams stripped an additional 30.15 acres. In total, 45.8 acres in the APE were mechanically stripped (Figures 11 and 12).

Each machine set (a trackhoe, a front-end loader, and a water truck) was monitored by one or more archaeologists at all times. Monitors examined the stripped areas for buried features or artifacts. Upon observation of a buried feature, the archaeologists spray-painted its boundary and assigned it a unique provenience-designation number. The feature boundary was then total-station-mapped by CAGST personnel. Likewise, diagnostic or unique artifacts encountered during stripping were assigned unique provenience-designation numbers, point-located with a total station, and collected from the stripped surface. Some ground stone artifacts (typically metates) were subjected to a specialized collection process. If sediment adhered to the grinding surfaces, selected metates were wrapped in plastic shrink-wrap to lock the dirt in place and avoid possible contamination. These artifacts were later evaluated for their appropriateness for pollen-wash analyses. When a metate was collected and packaged in this way, a control pollen sample was point-located and collected from the area adjacent to the artifact.

Figure 10. Heavy equipment utilized during mechanical stripping: (*top*) an excavator, a front-end loader, and a water truck, view to the west, and (*bottom*) two excavators stripping two adjacent MSUs.

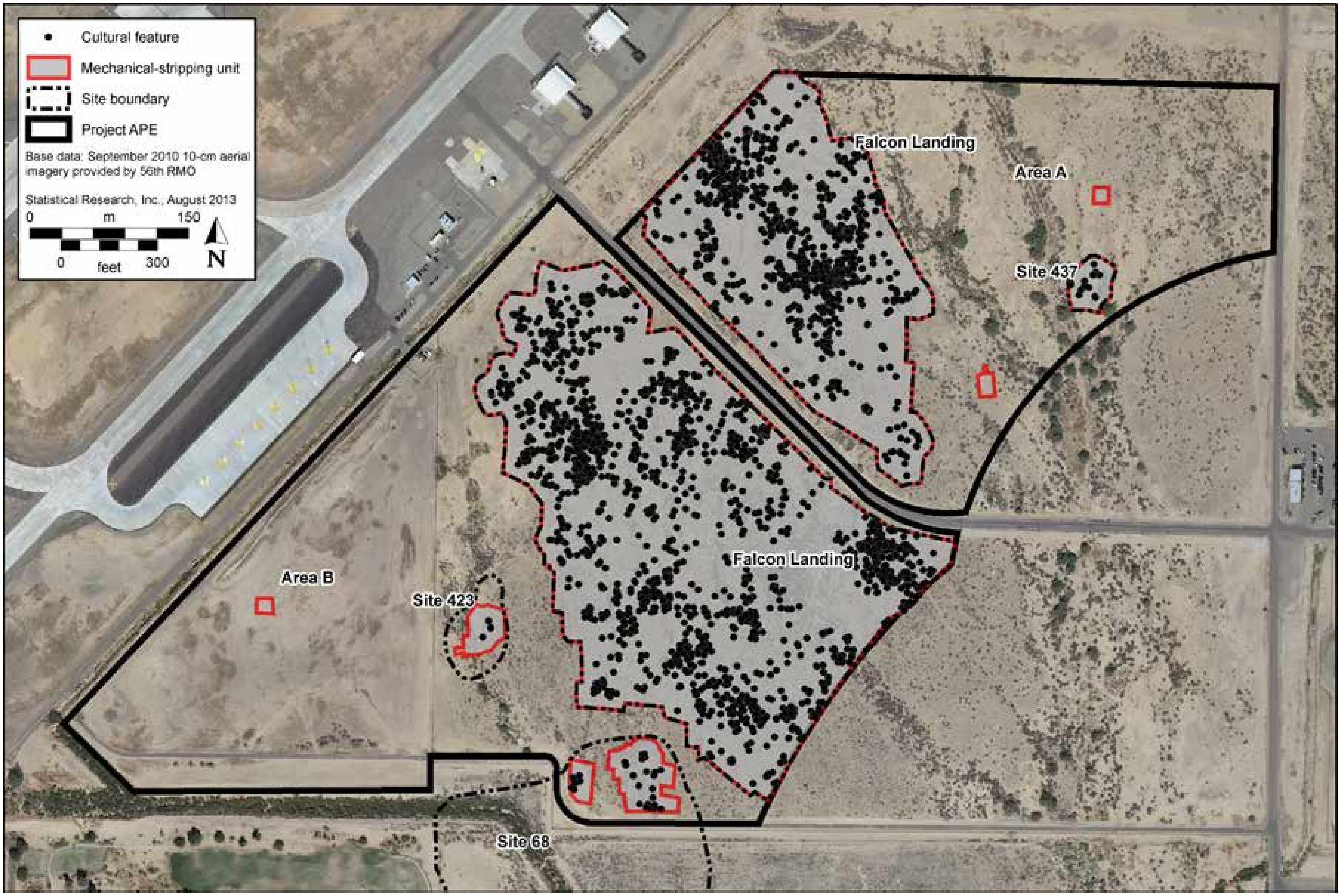

Figure 11. Map showing completed Phase 2 excavations.

Figure 12. Photographs of Phase 2 excavations: (*top*) Area A, view to the southeast, and (*bottom*) Area B, view to the northeast.

Selecting Features for Excavation

In accordance with the project research design (see Chapter 2) and HPTP (Hall et al. 2011), a sampling strategy was developed to maximize efficiency and resources while acquiring the most useful and meaningful project data. Phase 1 site testing and intersite trenching provided preliminary estimates of the numbers of features of each feature type that would be encountered during excavation (Hall and Wegener 2011; Hall et al. 2011). A strategy was developed by which at least 50 percent of all features by feature type were excavated. It should be noted, however, that this strategy did not apply to burial features. The HPTP and project NAGPRA Plan of Action required the excavation of all encountered burial features. The factors that contributed to the selection of which nonburial features to excavate are described below.

The estimates developed during the testing phase proved largely accurate, with the exception of architectural features (i.e., structures). Far more structures were forecast from testing than were encountered during the Phase 2 excavations. As a result, all 52 structures identified during mechanical stripping were excavated during Phase 2 efforts. Several of the features initially identified as structures were, through manual excavation, discovered to be features of other types, such as large extramural pits (e.g., Feature 4355), activity surfaces (e.g., Feature 10599), or noncultural features (e.g., Feature 12103).

The majority of features identified during mechanical stripping were extramural pits. This feature type presented several challenges to achieving our desired 50 percent sample. First, the number of extramural pits encountered during mechanical stripping exceeded 2,800. Excavating 50 percent of these proved a taxing enterprise. Additionally, because the sample set was so large, selecting the features for excavation required consideration of several attributes, to ensure that the 50 percent sample was as representative as possible of the project as a whole.

Determining which features to excavate and not to excavate is definitely a subjective undertaking. This endeavor was guided by the project HPTP (Hall et al. 2011). For example, Hall et al. (2011:49) stated:

> We will concentrate our efforts during Phase 2 on those features that contain deposits that can provide data pertinent to the research design, including architectural features, food-processing features, middens, and burials. If possible, all such features with high information potential will be excavated in their entirety; middens will be sampled. When sampling is necessary, our sampling strategy will focus on identifying the range of features present based on (1) function, such as pit structures, roasting pits and *hornos*, trash deposits, etc.; (2) the spatial distribution, such as the presence of house groups (e.g., clusters of pit structures and extramural features, etc.); (3) age, to help ensure that all temporal components are sampled; and (4) content, such as burned or trash-filled features. For example, burned and trash-filled pit structures and thermal-pit features would be given high priority, as they provide large quantities of material culture and organic remains suitable for the examination of technology, subsistence, and chronology.

Selecting which extramural features to excavate followed this basic sampling strategy when Phase 2 efforts began. Following the completion of mechanical stripping in an MSU, the total number of extramural features in the MSU was halved, resulting in the target sample size for that MSU. The project directors, sometimes aided by the principal investigators or assistant project directors, would inspect each feature and evaluate its spatial and possible functional relationship to similarly situated features as well as its individual information potential. As Hall et al. (2011) suggested, features that were burned, trash filled, or part of a discrete cluster would have high information potential. The goal was to include in the sample not just those features that would provide the most data but also a general representation, horizontally within the MSU and vertically among strata. It should be underscored that sampling was not random. For example, features that appeared to belong to a cluster or those that seemed to be spatially related to a structure feature were preferred over those exhibiting ambiguous associations with other features.

On an individual basis, the information potential for each feature was predicted based on the presence of thermal contents, such as charcoal or ash, and visible artifacts as well as the feature's size and shape.

Burned material in a feature is of interest because of its potential for absolute-dating and plant analyses, heavily oxidized sediments are suitable for archaeomagnetic (AM) analysis, and charcoal may be collected and dated through radiocarbon analyses. Absolute dating of features is of incalculable importance in developing a model of chronological relationships across the entire site, both by the appearance of contemporaneous artifacts and by stratigraphic association.

Analytical Units

In most archaeological investigations similar to the Luke Solar project, the feature is the fundamental unit of observation and analysis. A feature represents a discrete complex of space and content, and features are relatable to other features as well as to a site as a whole. In some instances, though, feature clusters warranted collective examination at a scale independent of a site or locus. In these instances, we used the term *analytical unit* to represent a discrete cluster of structures and their associated extramural features or discrete clusters of extramural features without associated structures. As is discussed elsewhere in this volume (see Chapter 2), the contents and arrangements of houses, house groups, and feature clusters may shed light on production and consumption activities, such as resource procurement and processing, as well as more-social phenomenon, like social organization. The focus on attempting to define and collect data from analytical units during data recovery directed the sampling strategy in a manner that was mindful of the relationships among features and how these relationships add to our understanding of the sampled archaeological components in a way that would be unavailable with strictly high-resolution, single-feature-driven explorations.

Spatial distribution was not the only attribute contemplated when assessing analytical units. Temporal relationships added another dimension to the mechanism for grouping features into analytical groups. Indeed, the stratigraphic aspects of site-formation and site-use discussions provided a chronological framework for describing the attributes observed in multicomponent sites. Behavioral units of analysis, such as house groups or feature clusters, were better understood through examination based on temporal relationships. Furthermore, the chronological framework permitted a diachronic assessment of primary site activities and site function.

Feature Excavations

Feature excavation is often the most important component of the data recovery phase of an archaeological project in the desert regions of Arizona. It commonly provides the greatest opportunity to collect the most information from a variety of archaeological contexts. It is necessary, then, to maintain a high level of consistency in the procedures employed in collecting and characterizing data, to maximize the amount of comparable information. Thus, a strict set of excavation procedures was developed prior to data recovery (Hall et al. 2011). Every reasonable attempt was made to follow these procedures while acknowledging the need for flexibility during a long project with evolving conditions and circumstances.

Excavation procedures varied by feature type, based on the information potential of the feature type and the resource investment required to capture the most meaningful data. There was, however, a set of procedures applied to all features, regardless of type or sampling strategy. Every feature was assigned a unique provenience-designation number. The provenience-designation number identified the feature, in that the feature number was the provenience-designation number assigned when the feature was first encountered. Because the feature number is actually a provenience-designation number, it is immediately incorporated into the data-collection system. The feature provenience-designation number served as an anchor for all spaces investigated, items encountered, and samples taken. Indeed, all investigative arbitrary units and artifacts or samples collected were assigned unique provenience-designation numbers, and each of those numbers related back to the feature number. This allowed each feature to be examined and analyzed as a discrete complex of space and content.

Also, every feature maintained a relationship to a vertical control. In most cases, the vertical control was an 18-inch length of rebar driven into an accessible area near the feature. Depending on the density of features in the area, a single vertical-control nail could serve for several features. All vertical-control nails were assigned unique provenience-designation numbers and were mapped with a total-station. Elevations for most feature excavations were recorded from a line affixed to each vertical nail and leveled with a line level. A tape measure was then used to record the distance from the leveled line at the vertical control to the point where the depth was measured. The recorded depths, in concert with the total-station-mapped vertical nails, allowed for the collection of elevation data across the project sites.

Artifacts and samples were collected from features either by point-location or by attributing each item to a larger volume of sediment (such as a level within a section). In most cases, decisions about whether or not to point-locate artifacts were made according to the judgment of the excavator. Point-located artifacts and samples were assigned their own unique provenience-designation numbers and mapped in plan view and/or cross section, and their depths were recorded in centimeters below the leveled line. Collected artifacts and samples (such as flotation samples) were assigned the proveniences of their recovery contexts (e.g., the provenience-designation number of a level, unit, or feature).

Procedures specific to or associated with particular feature types are discussed below.

Architectural Features

Structures offer a wealth of information relating to land use, chronology, cultural affinity, and social organization. It is reasonable, then, to devote more resources and attention to the excavation of structures than to more-redundant feature types, such as extramural pits. Moreover, the participation of structures in clusters, groups, or other kinds of metafeatures can aid investigators in their attempts to define an overarching organization of the site, rather than simply a collection of loosely related cultural features. Investigation of possible house groups as analytical units, as defined above, is a crucial step in understanding the domestic organization of the prehistoric inhabitants of the project area.

Structures identified during mechanical stripping were explored to determine their preserved size, shapes, and, if possible, orientations as well as to collect artifacts and pollen, macrobotanical, and radiocarbon and AM samples. In order to collect data to examine the range of variation and the spatial organization of structures at the project sites, we manually excavated control units in all structures to assess their condition and contents. In most cases, structures were investigated first with the placement of one or more 1-by-1-, 1-by-2-, or 2-by-2-m test pits. Occasionally, if structure boundaries were obscured or unclear in plan view, hand-stripping units (HSUs) or HTs were excavated to define feature margins. The size of a structure determined the size and number of control units. Each test unit was excavated in arbitrary 10-cm or stratigraphic levels. All excavated fill from these arbitrary units was screened through 1/4-inch hard-wire mesh, and pollen and flotation samples were collected from most levels of most units. Excavation of each control unit concluded when the excavators identified the structure floor or determined that the floor was no longer preserved and that they had removed all feature-fill sediments. In some cases, additional control units were initiated and excavated in an effort to identify hearths or other intramural thermal features. These kinds of subfeatures were targeted in the hopes of identifying architectural subfeatures for AM or radiocarbon sampling, to establish absolute dates for structures, and for macrobotanical and pollen sampling.

Procedures for excavating the rest of a structure depended on the presence or absence of internal stratigraphy. If the structure fill was stratified, the structure was excavated stratigraphically, its fill was screened through 1/4-inch hard-wire mesh, and flotation and pollen samples were collected from each level of each stratum. If the structure fill was not stratified, further excavation was accomplished by dividing the structure into halves or quarters, creating sections for investigation. Each section was then excavated in separate, arbitrary levels: fill and floor fill. Fill consisted of the upper structure fill. Floor fill typically corresponded to 10–15 cm of fill resting on the structure floor. Floor fill received its own stratum and level designations, to separate it from the rest of the structure fill. All fill was screened through 1/4-inch hard-wire mesh. Additional flotation and pollen samples were collected from both the fill and floor-fill levels in excavated sections when an abundance of charcoal, ash, or burned sediments was present.

Excavation of all sections or stratified levels of structure fill resulted in exposure of the structure floor or, if the floor was not preserved, the soil on which the floor was constructed. Artifacts or ecofacts in direct contact with the floor were presumed to be associated with the use of the structure feature or its abandonment. When encountered, floor artifacts were photographed, point-located, and collected individually. If present, intramural pits were then identified, and their relationships to the structures in which they were found were assessed. If they appeared to be intrusive, they were treated as separate features, and if chosen for excavation, they were excavated after completion of the structure excavations. True intramural features were defined and examined as subfeatures of the structures in which they were encountered. These included postholes, hearths, and thermal and nonthermal pits. Subfeature pits were excavated individually. All intramural subfeature fill was screened through 1/4-inch hard-wire mesh. Flotation and pollen samples were collected from all intramural subfeatures except postholes. Following the excavation of intramural subfeatures, each structure was photographed, and scaled architectural plan views and longitudinal and latitudinal cross sections were drawn at a 1:20 scale. Each structure plan view included the structure footprint, intramural subfeatures, architectural elements, and point-located artifacts.

Extramural-Pit Features

Extramural-pit features were, by far, the most numerous encountered (n = 2,800) and composed the largest percentage of excavated features (70 percent of excavated features were extramural pits). Although extramural-pit features customarily exhibit considerable variation in size, shape, and contents, the risk of redundancy is extraordinarily high. Given the large number of extramural-pit features identified in the project area, efforts were made to limit the resource expenditure on each extramural-pit feature until it was determined that the information potential of a feature warranted further effort. This was achieved by initially excavating only a portion of each pit. Pits that contained relatively higher frequencies of artifacts, abundant burned materials, or diagnostic artifacts were completely excavated.

Each extramural pit was typically bisected, and one-half of the feature was excavated stratigraphically (if possible) or in a single, screened level. Each stratum or level was screened through 1/4-inch hard-wire mesh, and a flotation sample was collected from the fill. Once the base of an extramural pit was identified, a pollen sample was collected from the pit walls and base. At that point, 50 percent of the pit would have been excavated, a status we defined as *partial.* The pit dimensions were measured along its profile and extrapolated to the unexcavated portion, and roughly half the volume of pit sediments was screened and evaluated for artifacts and ecofacts. Partial excavation of a pit feature was sufficient to fulfill sampling needs for extramural pits (Hall et al. 2011). Nevertheless, some pit features warranted further examination. The contents and attributes of the excavated portion of a pit guided the decision of whether or not to continue excavating the rest of the pit. If the feature provided or had the potential to provide additional meaningful data, as described above, the remaining half of the feature was excavated. Excavation of the second half was informed by the pit characteristics discovered during excavation of the first half, such as general size and apparent stratigraphy. Fill from the second half was similarly screened through 1/4-inch hard-wire mesh, and flotation and pollen samples were taken. Excavation of the second half of a pit gave it the status of *complete* excavation. If the first half of the feature excavation provided relatively few meaningful data or if investigators believed that the second half of the feature would not provide additional information, excavation of the feature was halted after excavation of the first half. Regardless of whether it was completely or partially excavated, each feature was mapped to a 1:10 scale in both plan view and cross section. Photographs of excavated pits were taken at the conclusion of excavation.

Extramural-Pit-Feature Sampling

As noted above, and in accordance with the HPTP (Hall et al. 2011), a sampling strategy was developed in which we excavated 50 percent of features by type. This proved most challenging for extramural-pit features because of their high frequency. Over the course of Phase 2 data recovery, it became clear that feature attributes such as contents, cross-section shape, and extent and amount of burning were predictable from the pit profile. Relying on this predictability, we developed an additional excavation method for this feature type that we termed *sampling*. This method differed slightly from those described above for extramural pits, by eliminating certain procedures and resulting in greater excavation efficiency, with minimal loss of potential information. This increase in excavation efficiency allowed us to exceed the target of excavating 50 percent of all extramural features encountered during the course of the project (see Hall et al. 2011).

Sampled extramural pits were bisected, and a representative flotation sample was taken from the fill of one side of each feature. The remaining fill in that half was grab-sampled for artifacts and was not screened. If no artifacts were encountered or if the excavator saw no real potential for the collection of further artifacts or ecofacts to contribute to our interpretation of or knowledge about a particular feature, excavation was halted, and paperwork was completed. No hand-drawn maps were generated for sampled pits, and pollen samples were collected from the excavated half of each but were not point-located. The remaining half of each sampled feature was not excavated. This strategy greatly expedited the excavations of this feature type. It is important to note, however, that commitment to the sample level of effort was not absolute; if at any time the excavator identified materials or attributes of a feature that warranted further scrutiny, the feature was reevaluated and excavated with a higher level of effort. This included screening, hand-drawing of maps, and point-location of pollen samples. The goal of the sampling level of effort was to minimize resource expenditure on features that quickly proved limited in their information potential.

Middens

Four middens were originally identified and excavated during the Luke Solar project; however, two of these middens were later determined to be natural (noncultural) deposits. In most archaeological projects, middens are defined as “thick, dark-stained accumulations of occupational debris containing high densities of artifacts, food remains, charcoal, and other organic and inorganic refuse from habitation-area activities” (Mabry 2008:157). The two middens defined for the Luke Solar project did not contain the rich assortment of artifacts and organic materials as described by Mabry (2008). Instead, the two Luke Solar middens were defined as an accumulations of sediments containing cultural material such as charcoal, ash, and artifacts that have been deposited through human action. The middens were too large to excavate in their entirety. To sample them, the sediments above each midden were removed mechanically to determine its horizontal extent. Once the midden was completely defined in plan view, then one or more transects of arbitrarily defined 1-by-1- or 2-by-2-m test units were excavated within the feature. For example, a series of units would be placed along the long axis of the feature, as defined in plan view, and every other test unit would be excavated. A similar transect of arbitrary units would be placed perpendicular to the long axis. These test units were intended to define a meaningful picture of the midden’s content and extent. Test units were excavated in arbitrary 10-cm levels within identified strata, with each stratum initiating a new level. Removed sediments were screened through $^1/_4$-inch hard-wire mesh. Each excavated level also yielded flotation and pollen samples. Excavations within the units were halted once sterile (noncultural) sediments were encountered. If a midden displayed internal stratigraphy, then additional arbitrary units were stratigraphically excavated.

Activity Areas

In total, 14 activity-area features were observed in the project area. An activity area was typically encountered as a surface upon which artifacts rested and/or other features originated but that did not exhibit clear boundaries. The methods used to excavate activity areas broadly resembled those used to excavate structures. First, a series of 1-by-1-, 1-by-2-, or 2-by-2-m test units was dug to examine any vertical stratigraphy present in the feature. From there, a series of arbitrary units was excavated to expose the extent of the identifiable activity area. Features originating at an activity-area surface or intruding upon it were considered separate features and not subfeatures of the activity area. Thus, an activity area and its associated features can be thought of as an analytical unit, defined as a set of related features that are all associated with that surface.

Fill deposited atop the activity area surface was screened through 1/4-inch hard-wire mesh. Flotation and pollen samples were collected from most levels of most units. Each activity area was photographed, and plan views and cross sections were hand-drawn to a 1:20 scale, to document the extent of the activity area as well as the presence and relationship of any intrusive features.

Charcoal or Ash Lenses

Excavation of charcoal- or ash-lens features required a slightly different set of procedures from those employed for other features. Thin bands of charcoal or ash may be either natural or cultural in their creation. The first step in determining whether an ash or charcoal lens was cultural or noncultural was to mechanically remove the sediment above the feature to determine the aerial extent of the ash or charcoal. This was accomplished by expanding the mechanically stripped area. If buried features at higher elevations were threatened by the stripping swaths, then those features were excavated prior to swath excavation. We determined that large areas of charcoal flecking were remnants of natural, surficial burn episodes and reassigned them as noncultural features. Small lenses containing mostly ash, however, appeared to be more likely cultural and were excavated in the same manner as pits, as described above.

Noncultural Features

In total, 404 features initially identified during mechanical stripping were later discovered to be noncultural in origin. Mechanical-stripping efforts revealed many soil anomalies, including both cultural and natural features. A strategy was developed in which features of questionable cultural origin were regarded as such until excavation proved otherwise. A feature was deemed noncultural when, during the course of excavation, attributes of size, shape, and contents were identified as natural in origin. The majority of noncultural features were subsequently determined to be subsurface root burns. This natural phenomenon appeared very similar to pit features during mechanical stripping, and the resulting features were approached as features of archaeological significance. Once a feature was reevaluated as noncultural in origin, any collected samples were discarded. Artifacts were generally reassigned to the next-most-precise context, generally the MSU. This allowed us to collect the artifacts and to sacrifice provenience precision while maintaining provenience accuracy. In other words, artifacts collected from noncultural features were treated similarly to those collected from the stripping surface.

Weekly Reports

SRI prepared reports on a weekly basis, in accordance with the HPTP (Hall et al. 2011:Addendum B). These reports documented the cumulative area mechanically stripped; the total numbers of features by type, both identified and excavated; and the numbers and types of artifacts and samples collected. Preparation of the weekly report required data compilation from a variety of sources. Near the end of each work week, CAGST staff shot the boundaries of each in-progress MSU with a total station, adding to the cumulative map of mechanical-stripping progress. Provenience-assignment data were entered daily, and artifact- and sample-collection data were entered weekly. These data were extracted from the database on a weekly schedule, to document the numbers of features identified and excavated to date as well as the numbers and types of items recovered from feature and nonfeature contexts.

Site Closure

Following the completion of a 50 percent sample of excavated features by type, we performed site-closure efforts in a good-faith effort to identify and remove all burials and mortuary items from within the APE (Hall et al. 2011:Addendum B). This was accomplished by removing all fill from unsampled features, to determine whether human remains or mortuary items were present. No data were collected from these features, save only a visual determination of whether each feature was thermal or nonthermal and whether or not each feature was bell shaped in cross section. No samples or artifacts were collected from these features. The total number of features examined in this way was 1,428, or 42.4 percent of the total number of identified features. Site-closure efforts were completed between April 10 and 24, 2013.

Treatment of Human Remains and Repatriation

In accordance with the project NAGPRA Plan of Action (25 U.S. Code §3001 et seq. and 43 CFR 10, as updated) and the HPTP (Hall et al. 2011), all human remains encountered at any phase of the project prompted the immediate cessation of related excavation activities at the discovery locale and the notification of LAFB. LAFB then notified all appropriate tribes of the identification of human remains or funerary items. LAFB was also responsible for coordinating with descendant groups in regard to any traditional ceremonies requested prior to excavation of the remains. Following completion of the notification process and traditional Native American on-site activities, a qualified SRI bioarchaeologist carefully and respectfully removed the remains.

A total of two human burial features was identified in the Luke Solar project area. With the exception of clearly isolated elements, human remains were approached with the presumption of context. In other words, the presence of human remains was sufficient to consider the remains part of a feature. A unique provenience-designation number was assigned to the feature, and excavation proceeded with attention paid to the possible identification of any apparent feature boundaries, funerary objects, and burial context. All burial features were excavated in their entirety, and all matrix was screened through 1/8-inch or 1/16-inch hard-wire mesh. Human remains and artifacts were, when practicable and appropriate, point-located prior to removal. All human remains and associated artifacts were temporally housed at LAFB, in Building 301, in a secure and climate-controlled facility. No photographs of human remains or associated funerary artifacts were taken, and no destructive analyses were performed, in accordance with the project NAGPRA Plan of Action and HPTP (Hall et al. 2011). All items associated with burial features were stored in natural containers and materials, such as unbleached cloth, paper bags, and cardboard boxes. Human remains and mortuary artifacts were not removed from the base, and all bioarchaeological and artifactual analyses were performed in the secured location (Building 301). Descriptions of the burial features appear elsewhere in this volume, and the results of bioarchaeological investigations are presented in Volume 2 of this series.

Following bioarchaeological and mortuary analyses, all human remains and mortuary items recovered from burial features were repatriated to the Salt River Pima–Maricopa Indian Community on June 28, 2013. The repatriation was conducted by LAFB in accordance with agreements with claimant groups, as prescribed by the project NAGPRA Plan of Action.

Laboratory Methods

Artifacts and samples recovered for laboratory analyses (with the exceptions of human remains and associated burial artifacts) were delivered to SRI's Tucson laboratory on a weekly basis. Incoming items were subjected to rigorous contextual data-collection procedures to ensure that a complete and accurate set of provenience information followed the items from the field to the laboratory. As noted above, the provenience-designation system attached to each space of investigation, including artifacts, a set of information related to context, cultural-feature association, and location. The number assigned to the context from which every artifact or sample was taken stayed with each item through its laboratory activities. This number carries with it all relevant field information.

All artifacts and samples arriving at the laboratory went through a check-in process to verify that every piece of contextual and tracking information was accurate and consistent with field information. The next step was to issue an inventory code, a nine-character hexadecimal primary key, to each item. Each inventory code is unique and encoded with all site, project, and provenience information. A label containing all of this inventory and provenience information, both in written format and as a scannable bar code, was printed and affixed to the relevant artifact or sample bag. The addition of the scannable bar code allows for tracking data to be collected as an item moves from storage to analysis to curation. Thus, the inventory code allows for constant real-time information related to the location of each item and the context from which each item was collected, as well as information collected about items during the analysis stage of the project and the physical locations of items or samples.

Artifacts arriving at the laboratory from the field were cleaned and processed through an initial sorting procedure, to divide items into various artifact classes (e.g., ground stone, flaked stone, ceramic, and faunal bone) or sample type (e.g., radiocarbon, AM, flotation, and pollen). The laboratory director then verified the accuracy of artifact and provenience information associated with artifacts or samples and instructed laboratory personnel to enter the information into SRID. At that time, the scannable inventory code was generated, printed, and placed on the artifact or sample bag, and items were stored in boxes to await further analysis.

SRI laboratory staff processed all flotation samples collected in the field using a Dausman Flote-Tech Model A flotation machine. The Flote-Tech is a self-contained recirculating system that consists of two adjoining chambers with separate screen boxes for the light and heavy fractions, a water pump for recirculating the water, and a sludge pump to pump off sediment and excess water. This system offers several advantages over other flotation methods. First, it is by far the most efficient system, able to process a standard 4-liter sample in less than 15 minutes. It also can handle samples as large as 20 liters, and more than 100 liters of samples can be processed before the system requires cleaning. Agitation of a sample is accomplished with pressurized water, thereby minimizing the potential for damaging delicate macrobotanical remains and maintaining consistency in the agitation technique and the light-fraction collection. The system also offers a second agitation option, one that makes it possible to collect near-floatable (i.e., slightly denser than water) specimens. Finally, the self-contained nature of the system conserves water while minimizing cross-contamination between samples.

The light-fraction materials, largely consisting of floatable plant remains, were collected using a $^{1}/_{16}$-inch-mesh-screen box. After air drying, the light-fraction materials of the processed flotation sample were placed in 4-ml plastic zip-closing bags and inventoried in the same fashion as other collected artifactual materials and samples. Inventory information was written on the outside of the bag, and the screen size used in collecting the light fraction was recorded. Heavy-fraction materials, usually artifacts and gravels, were also collected using a $^{1}/_{16}$-inch-mesh screen. These materials were passed through a series of nested screens and then sorted into artifact classes and dreck.

Public Outreach

SRI and LAFB had opportunities during and following fieldwork to discuss the project with professional, military, and public audiences. Information-sharing meetings were held on-site on February 24, 2012, and April 12, 2013. These on-site meetings were very well attended by many professional and avocational archaeologists as well as by university students, including participants in the University of Arizona Archaeological Field School. In addition, LAFB published several newspaper and online articles and produced video reports as the project progressed through fieldwork, for the benefit of interested military personnel and the general public. LAFB also arranged a tour for local high-school students, and military professionals frequented the site throughout the course of fieldwork. The Luke Solar project has been the subject of numerous presentations for both state and national conferences, historic preservation expositions, and public lectures. The following is a list of locations where information concerning the Luke Solar project has been or is scheduled to be presented:

- Arizona Archaeology Expo at the Arizona State Capitol, March 17, 2012
- Agua Fria Chapter of the Arizona Archaeological Society, February 11, 2013
- Arizona Archaeology Expo at Agua Fria National Monument, March 16, 2013
- Four Southern Tribes Meeting, Salt River Pima Maricopa Indian Community, April 2, 2013
- Arizona Historic Preservation Conference, Mesa, Arizona, June 11–13, 2013
- Four Southern Tribes Meeting, Gila River Indian Community, June 25, 2013
- 86th Annual Pecos Conference, Flagstaff, Arizona, August 8–11, 2013
- Four Southern Tribes Meeting, Tohono O'odham Nation, November 15, 2013
- Arizona Archaeology Expo, Catalina State Park, March 29, 2014
- 79th Annual Society for American Archaeology Conference, Austin, Texas, April 25, 2014
- Arizona Historic Preservation Conference, Rio Rico, Arizona, June 11–13, 2014
- 87th Annual Pecos Conference, Blanding, Utah, August 7–10, 2014
- Arizona Museum of Natural History for the Southwest Archaeological Team (SWAT), Mesa, Arizona, October 2, 2014
- Litchfield Park Public Library, October 17, 2014
- Phoenix Chapter of the Arizona Archaeological Society, March 12, 2015
- San Tan Chapter of the Arizona Archaeological Society, April 15, 2016
- Arizona Archaeological and Historical Society, May 16, 2016

CHAPTER 4

Falcon Landing, AZ T:7:419 (ASM)

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Introduction

This chapter describes the archaeological mitigation of a part of Site 419, a multicomponent archaeological site covering approximately 44 acres within the project APE (see Figure 1). The original Site 419 boundary was much smaller and was investigated during SRI's Phase 1 data recovery, described below. Also investigated during Phase 1 were Sites 420, 421, and 422 (Hall et al. 2011). During the process of investigating these sites, it was realized that the majority of buried cultural resources in the Luke Solar project APE encompassed all of the previous boundaries of Sites 419, 420, 421, and 422. This situation prompted SRI to combine the sites into one large, contiguous archaeological site, and the "AZ T:7:419 (ASM)" designation was retained for this large, 44-acre site. The following chapter describes the Phase 1 investigations of Sites 419, 420, 421, and 422, as well as the Phase 2 data recovery of Site 419, which now encompasses the smaller sites.

Previous Archaeological Investigations

In 1991, ACS conducted an archaeological survey of 440 acres located south of LAFB, including the current Luke Solar project area (Adams 1991) (see Figure 1). Adams (1991:Figure 2) recorded approximately 32 isolates within the Luke Solar project area. According to Adams (1991:4), the majority of the isolates consisted of flaked stone and ground stone artifacts, and there were a few low-density ceramic scatters. At the time, no archaeological sites had been identified within the current Luke Solar project area; however, Adams did record Site 68, located mostly to the south of the current APE (see Chapter 5).

In 2003, SRI conducted an archaeological survey of a 275-acre parcel of LAFB for the MSA (Tagg et al. 2007) (see Chapter 1). In total, seven new archaeological sites were identified during that survey, five of which were located within the current Luke Solar project area (see Figure 8). Those five sites were numbered Luke 03A-02–Luke 03A-06 (Tagg et al. 2007:Figure 5). As described in Chapter 1, SRI obtained ASM numbers for the five sites prior to the beginning of Phase 1 investigations.

Site 419 was originally recorded in 2003 as Luke 03A-02 (Tagg et al. 2007:31–36) and was described as a low-density artifact scatter, 110 m north–south by 110 m east–west. In total, 75 artifacts were present, including 59 flaked stone, 13 ground stone, and 3 ceramic artifacts. Luke 03A-02 was assigned to the Gila-Salt Basin Hohokam based on the presence of buff ware ceramics and a projectile point. The buff ware sherds were considered to be Middle to Late Sedentary period (ca. A.D. 700–1300), and the projectile point was assigned to the Hohokam Classic period (ca. A.D. 1150–1425) (Tagg et al. 2007:36). Unfortunately, the projectile point was not relocated during the current project, but a cursory examination of the photograph (Tagg et al. 2007:Figure 10) suggested that the projectile point was actually an Archaic period–style dart point and not a Classic period Hohokam point.

Site 420 was originally recorded in 2003 as Luke 03A-03 (Tagg et al. 2007:36–41) and was described as an extensive, low-density artifact scatter with at least four discrete concentrations of artifacts, labeled Loci A–D. Artifacts on the site consisted of flaked stone, ground stone, ceramic, and Historical period artifacts as well as FAR. The site was located in Area A and measured 312 m north–south by 124 m east–west. The four loci (Loci A–D) were all about 50–80 m in diameter and consisted of 20–40 artifacts each. Overall, 154 artifacts were documented at Site 420, including 2 projectile points, a biface, 3 utilized flakes, 4 cores, 5 hammerstones, 4 metates, 5 manos, 10 indeterminate ground stone fragments, 32 ceramic sherds, and 86 flakes. One of the projectile points was described by Tagg et al. (2007:39) as a Pinto-style Archaic period point. This point was relocated during the current project and point-located as Provenience Designation (PD) 2163 (see Chapter 3, Volume 2). In 2005, Site 420 was revisited and resurveyed for the MSA-testing project (Tagg 2007:39–47) (see Chapter 1). As part of the MSA-testing project, the boundary of Site 420 was greatly expanded to the east and south. The new dimensions for Site 420 were 430 m north–south by 200 m east–west. In addition, Tagg (2007) recorded six surficial FAR concentrations, labeled Features 1–6. Following the resurvey, two backhoe trenches were excavated within the proposed MSA-road (now Strike Eagle Street) ROW, for a total length of 60 m. No buried artifacts or cultural features were identified in either trench.

Site 421 was originally recorded in 2003 as Luke 03A-04 (Tagg et al. 2007:41–45) and was described as low-density artifact scatter with ceramic, flaked stone, and ground stone artifacts. Ninety artifacts were documented on the site: 1 utilized flake, 1 core, 1 metate fragment, 1 mano fragment, 12 ceramic sherds, and 74 flakes. Seven of the sherds were red-on-buff, indicating a Middle to Late Formative period occupation (ca. A.D. 700–1300) (Tagg et al. 2007:45).

Site 422 was originally recorded in 2003 as Luke 03A-05 (Tagg et al. 2007:45–48) and was described as a discrete artifact concentration (AC 1) as well as a low-density artifact scatter. The site measured 40 m north–south by 47 m east–west. AC 1 consisted of 50 flakes, a biface, and a metate fragment located in a washed-out area in the western end of the site. Another 33 flaked stone, ground stone, and ceramic artifacts were distributed throughout the rest of the site boundary. The biface recorded in AC 1 (Tagg et al. 2007:Figure 18, BF-1) was relocated during the current project and was point-located as PD 5159 (see Chapter 3, Volume 2).

Phase 1 Data Recovery

Between November 3 and December 2, 2010, SRI conducted Phase 1 archaeological investigations at Sites 419, 420, 421, and 422 (see Figure 8) (Hall et al. 2011). The Phase 1 investigations included the survey and reevaluation of each site boundary, the identification of all surface features, and the location, mapping, and collection of all surface artifacts at the four archaeological sites in the APE. Each artifact was marked with a pin flag, assigned a unique provenience-designation number, mapped with a total station, and collected individually (Figures 13–16). In total, 1,192 artifacts were collected from the four sites within the APE (Table 3). In order to understand the nature of buried cultural resources within the APE, SRI conducted a combination of mechanical trenching followed by mechanical stripping. Backhoe trenches and mechanical stripping were used in conjunction to define the depth and aerial extent of buried cultural resources within the established site boundaries. Following the surface-artifact collection, each site had a series of backhoe trenches excavated east–west at regular intervals (Figures 17–20). Thirty-five backhoe trenches were excavated within site boundaries, totaling 2,579 m of trenches distributed among the four archaeological sites (Table 4). SRI archaeologists then cleaned and examined the entirety of each trench wall to identify buried archaeological features in profile. In total, 83 cultural features were discovered in trench walls at the four sites.

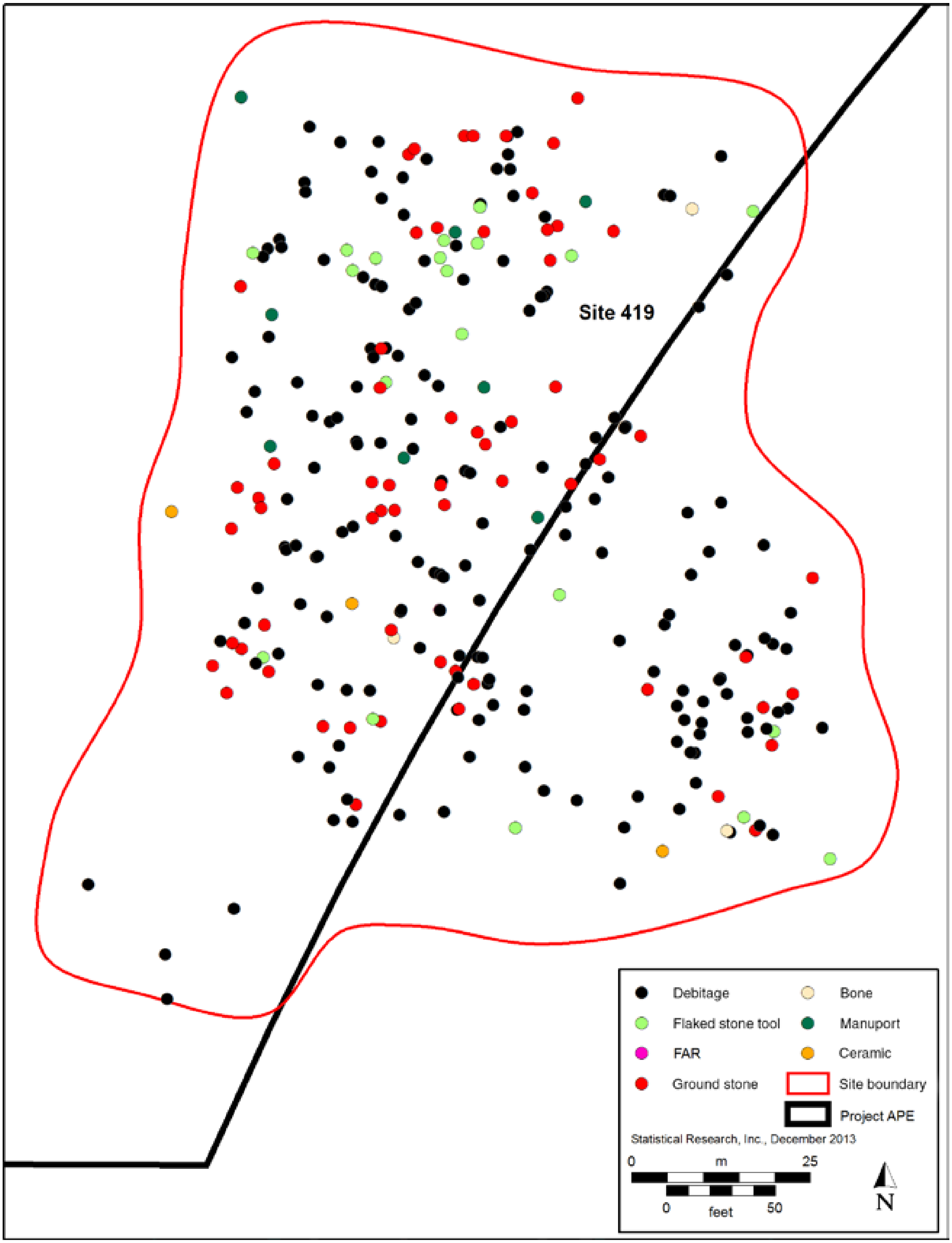

Figure 13. Map showing surface artifacts collected from Site 419 during Phase 1.

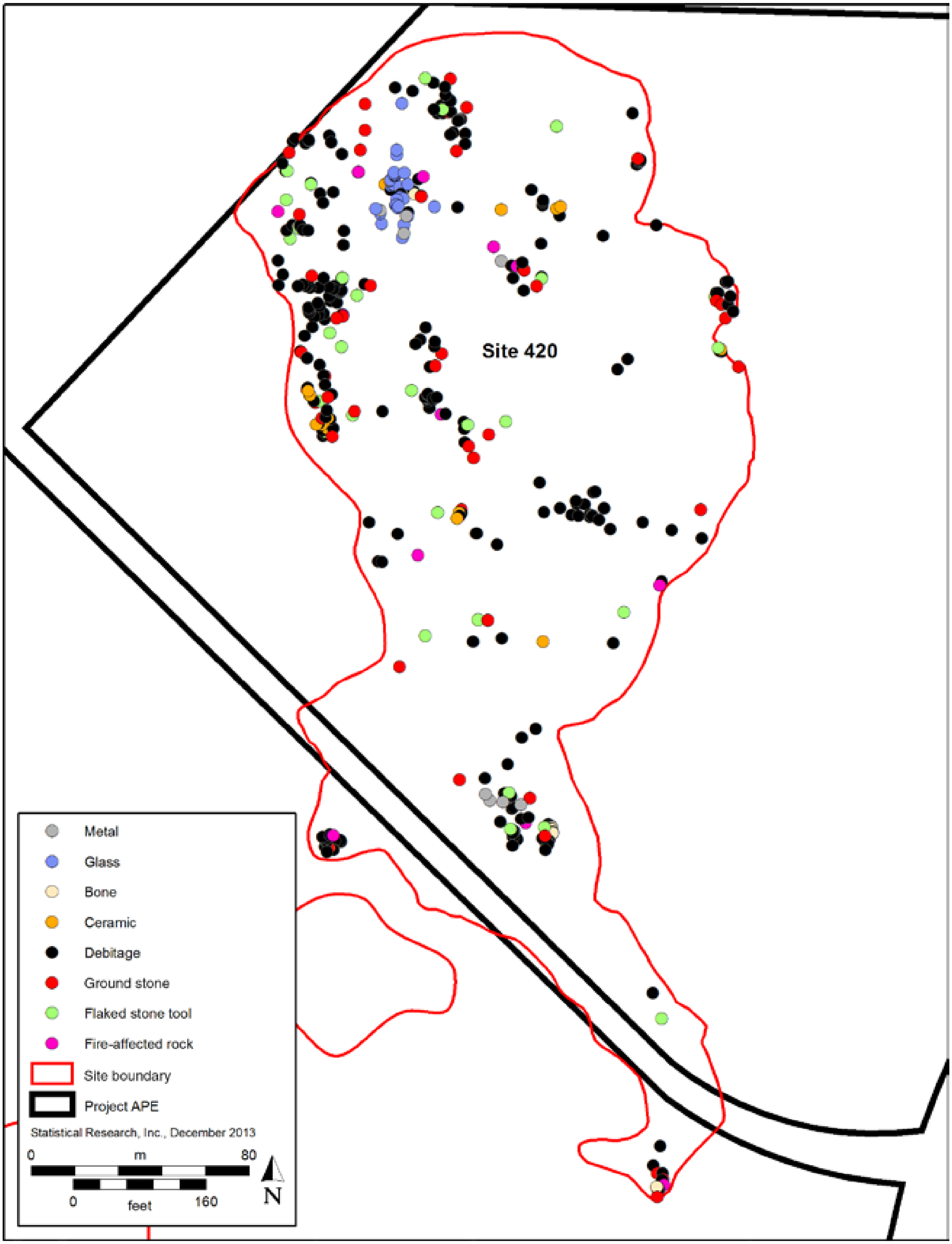

Figure 14. Map showing surface artifacts collected from Site 420 during Phase.

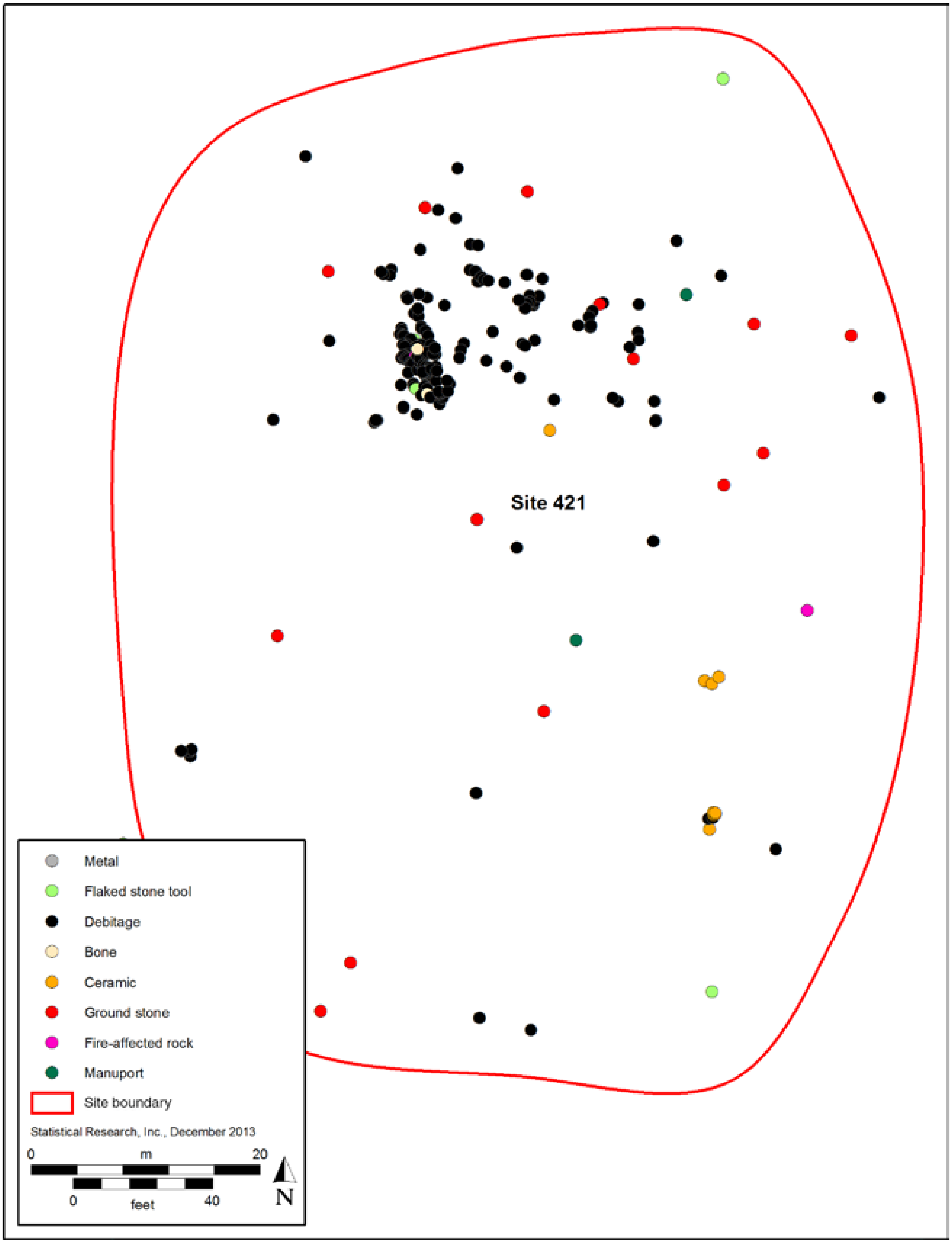

Figure 15. Map showing surface artifacts collected from Site 421 during Phase 1.

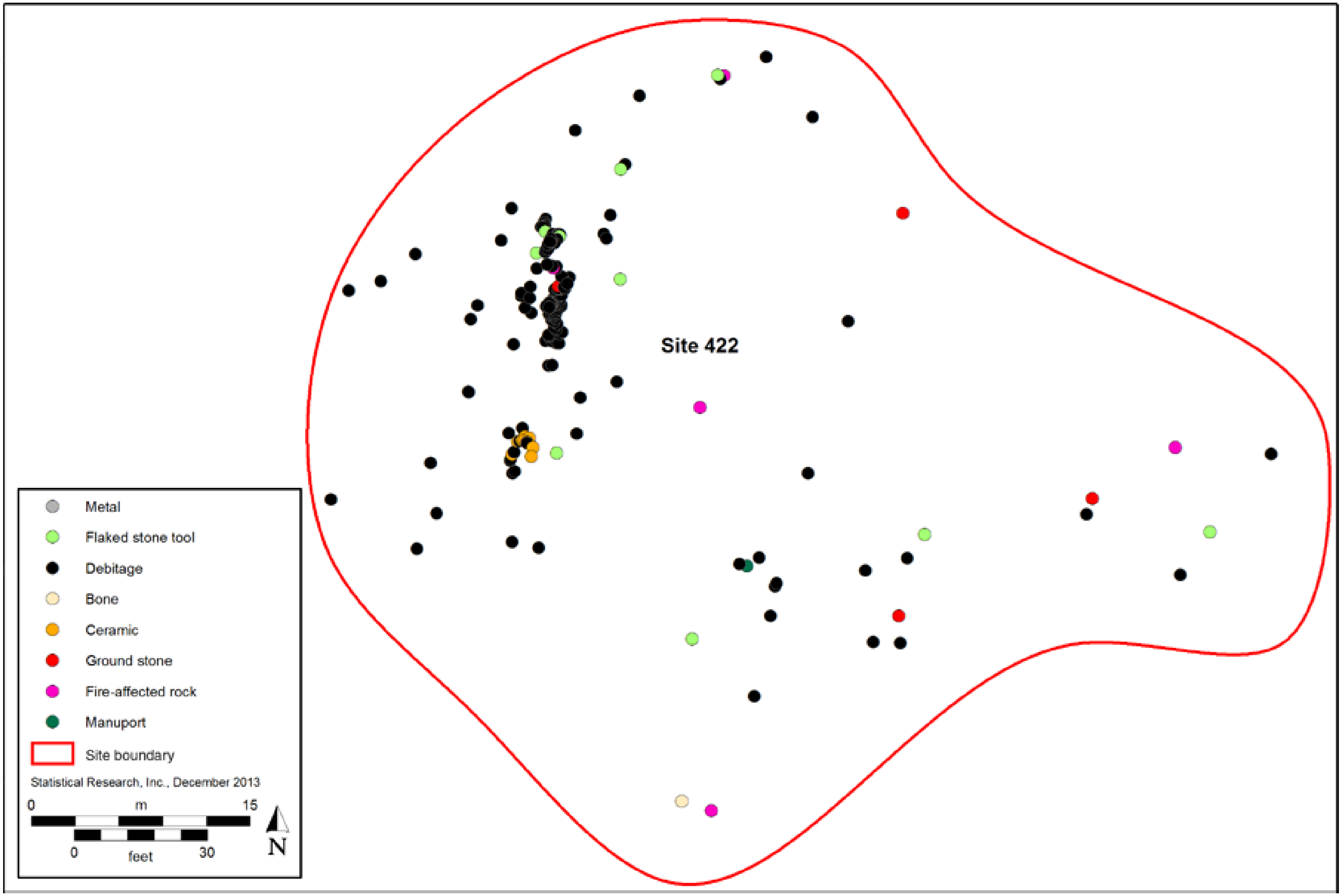

Figure 16. Map showing surface artifacts collected from Site 421 during Phase 1.

Table 3. Tally of Phase 1 Surface Artifacts at Sites 419, 420, 421, and 422

Site	Bone	Ceramic		Historical Period							Lithic								Total
	Unworked	Sherd	Rim Sherd	Bottle/Jar	Can	Electrical Component	Glass	Lamp Part	Metal	Other (Fasteners/ Fittings)	Manuport	FAR	Flaked Stone Debitage	Flaked Stone Tool	Indeterminate Ground Stone	Mano	Metate	Projectile Point	
Site 419	2	6	—	—	—	—	—	—	—	—	1	1	177	13	18	6	—	—	224
Site 420	9	28	2	12	3	1	103	29	20	9	—	16	286	30	29	13	14	2	606
Site 421	2	10	1	—	—	—	—	—	—	—	—	2	172	4	1	—	—	—	192
Site 422	1	10	—	—	—	—	—	—	—	—	1	5	139	9	2	1	1	1	170
Total	14	54	3	12	3	1	103	29	20	9	2	24	774	56	50	20	15	3	1,192

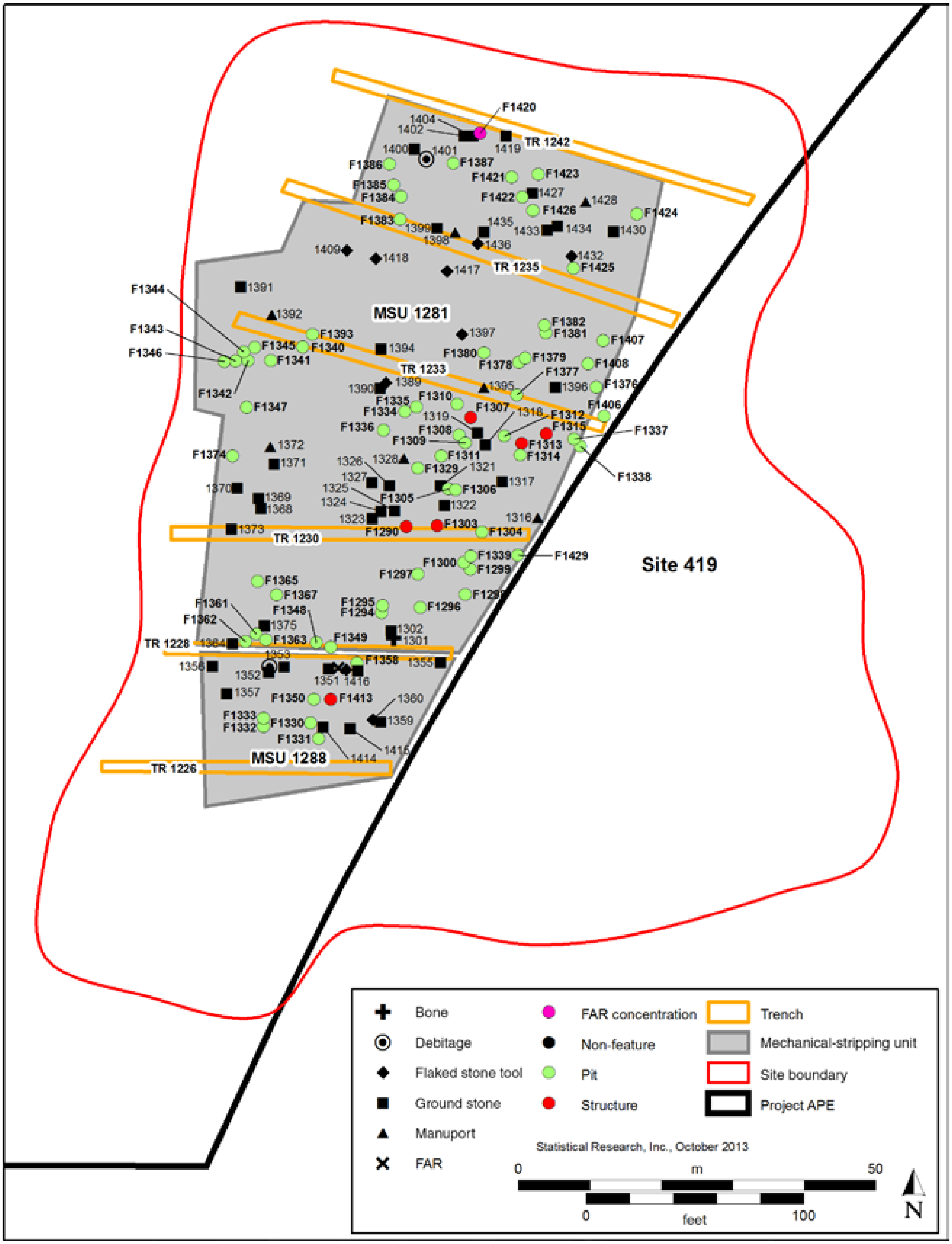

Figure 17. Map showing Phase 1 trenches and MSUs at Site 419.

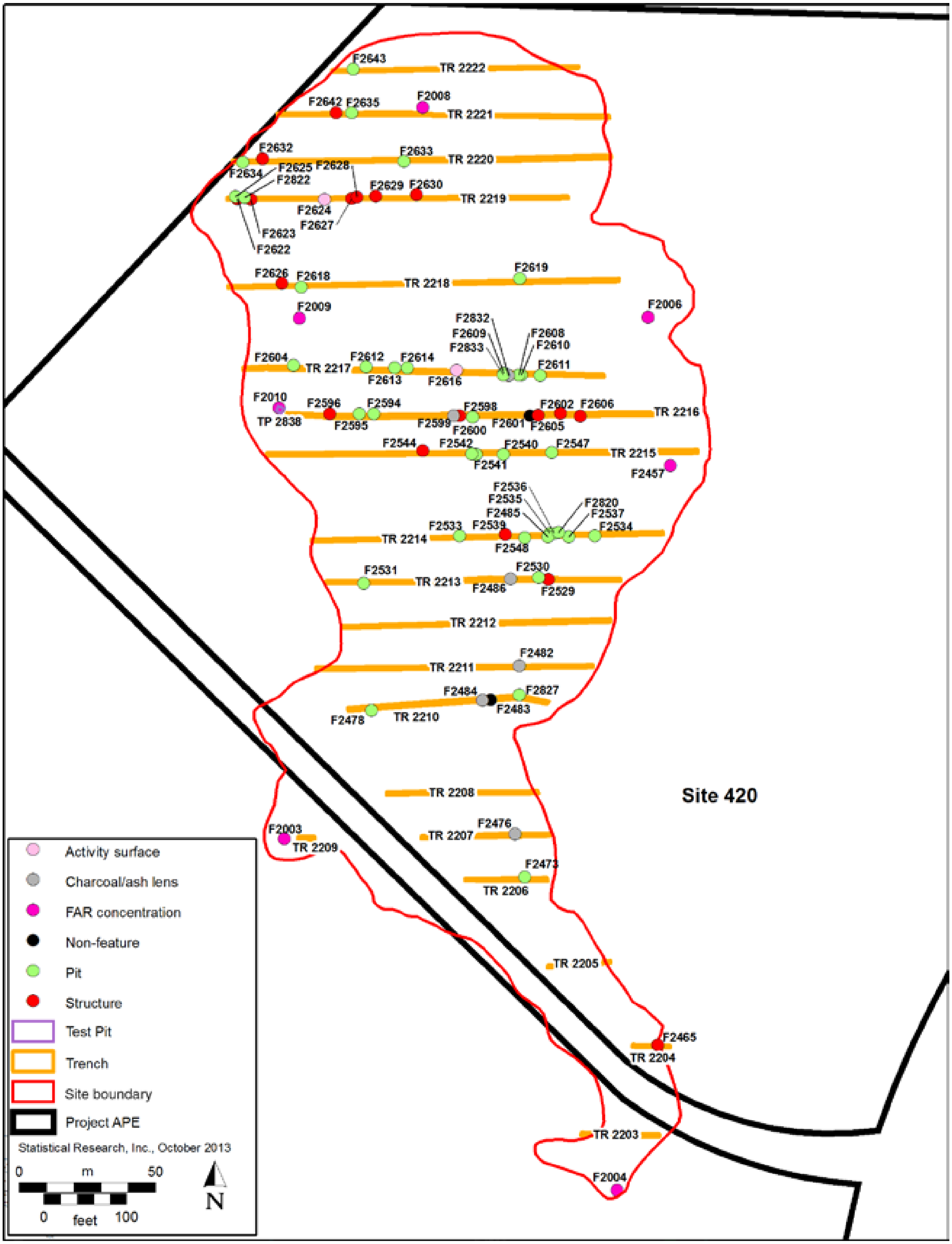

Figure 18. Map showing Phase 1 trenches at Site 420.

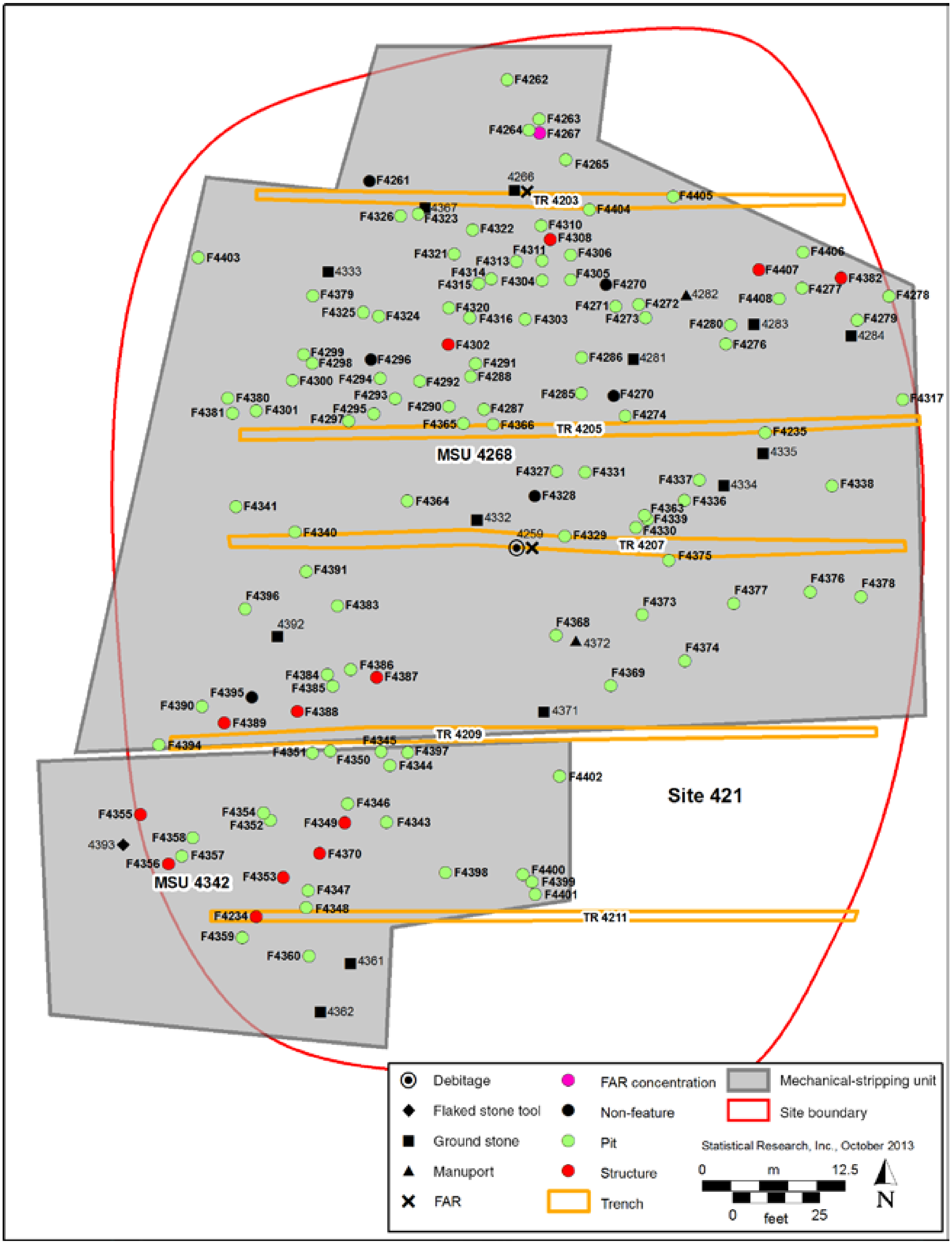

Figure 19. Map showing Phase 1 trenches and MSUs at Site 421.

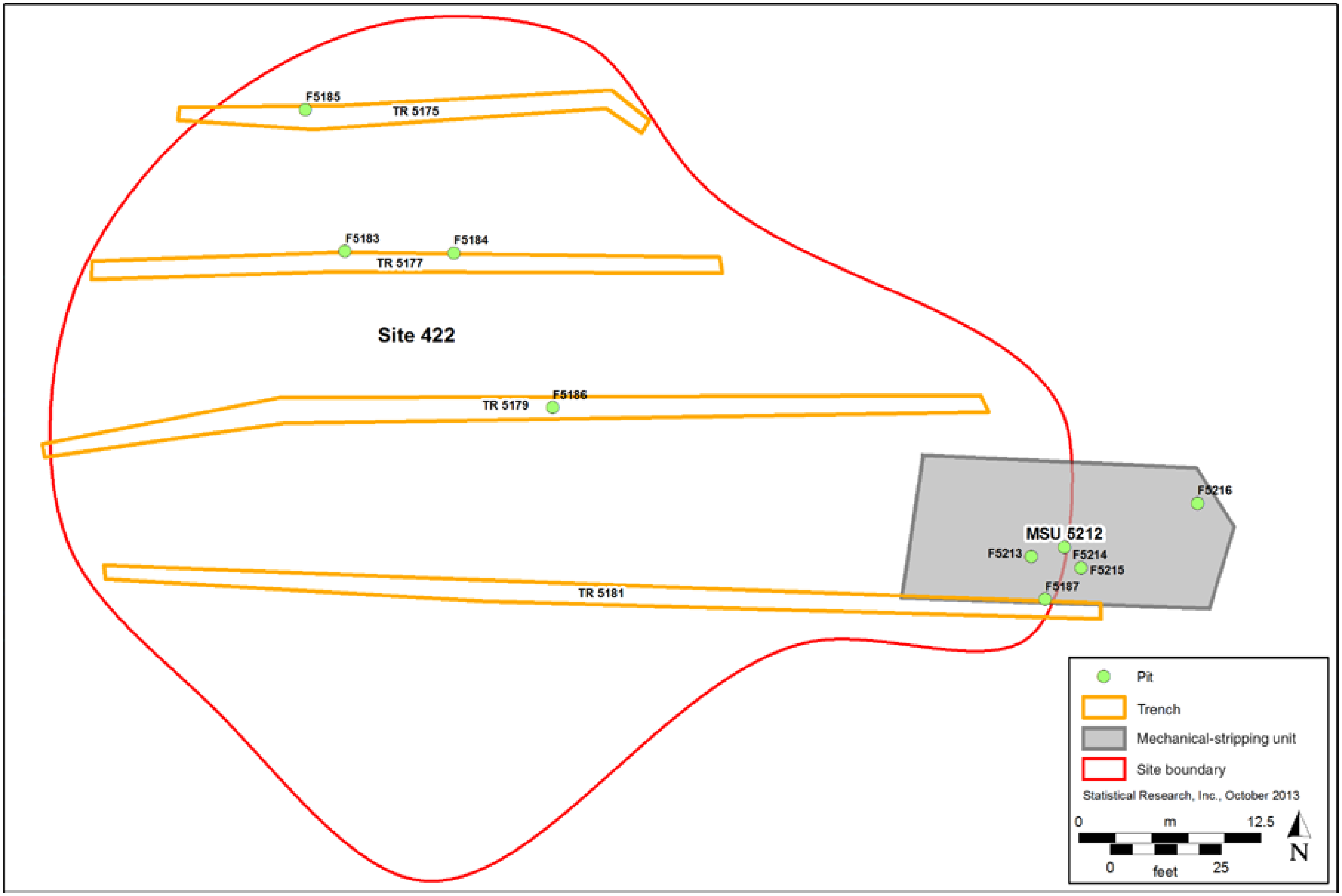

Figure 20. Map showing Phase 1 trenches and MSUs at Site 422.

Table 4. Results of Phase 1 Trenches Excavated at Sites 419, 420, 421, and 422

Site	No. of Trenches	Total Length of Trenches (m)	No. of Features Identified in Trenches
419	6	297	8
420	20	1,785	65
421	5	288	5
422	4	209	5
Total	35	2,579	83

Table 5. Results of Phase 1 MSUs at Sites 419, 421, and 422

Site	Area of MSUs (m^2)	No. of Features per MSU, by Preliminary Feature Type		
		Structures	Pits	Total
419	4,129	5	71	76
421	4,274	12	117	129
422	205	—	4	4
Total	8,608	17	192	209

A limited amount of mechanical stripping was also conducted during Phase 1. Portions of Sites 419, 421, and 422 were mechanically stripped to determine the aerial extent of buried features at those sites (see Figures 17, 19, and 20). The mechanical stripping was guided by the locations of buried features identified in backhoe trenches. In total, 2.1 acres (8,608 m^2) were mechanically excavated at the three sites (Table 5). The Phase 1 mechanical stripping at the sites resulted in the identification of an additional 209 buried features. A preliminary list of these features is presented in Hall et al. (2011:Appendix A). It should be noted that many of the Phase 1 features were revisited and excavated during Phase 2 data recovery; therefore, the feature types that were originally assigned often differ from those assigned during the final analysis and interpretation.

Site 419

Phase 1 at Site 419 began with the resurvey and establishment of the site boundary based on the presence of surface artifacts. The original Site 419 boundary was located on either side of the MSA safety arc, which represents the southeastern edge of the APE (see Figure 8). No ground-disturbing activities could occur beyond the safety arc; so, SRI's investigations were limited to the portion of the site west of the safety arc, and for that reason, no surface artifacts were collected from the portion of the site east of the safety arc. Approximately two-thirds of Site 419 lay within the APE, west of the safety arc; therefore, SRI's Phase 1 efforts were focused on that portion of the site (see Figure 13). All surface artifacts within the APE (see Table 3) were individually point-located and collected, and artifacts outside the APE were point-located, described, and left in place. Following the surface-artifact collection, a series of six backhoe trenches was excavated within the APE, and 8 buried features were identified in trench-wall profiles (see Table 4). Once all features were mapped with a total-station and recorded with a scaled, hand-drawn profile, MSUs 1281 and 1288 were excavated at Site 419 to expose buried features in plan view. In total, 4,129 m^2 were mechanically stripped at the site, exposing an additional 76 buried features in plan view (see Table 5). In addition, numerous flaked stone and ground stone tools were identified in extramural space during mechanical excavation of MSUs 1281 and 1288 (see Figure 17).

Site 420

Phase 1 at Site 420 began with the resurvey and establishment of the site boundary, as well as the relocation of the 6 surface FAR features identified by Tagg (2007). Three additional FAR features were identified in addition to the 6 previously recorded, for a total of 9 surface FAR features (see Figure 14). All surface artifacts within the APE (see Table 3) were individually point-located and collected. Once all surface artifacts had been collected, a series of 20 east-west-oriented backhoe trenches were excavated through the site, at 15–30-m intervals. The investigation of all the trench walls resulted in the identification of 65 buried features across the site (see Figure 18; Table 4). Each buried feature was mapped with a total-station and recorded with a scaled, hand-drawn profile. In addition, one of the FAR features identified on the surface of Site 420 (Feature 2010) was hand-excavated. A 2-by-2-m test unit was excavated in a single 10-cm level over the concentration of FAR. The excavation did not result in the identification of any subsurface features associated with the FAR; however, small numbers of flaked stone and ground stone artifacts were recovered.

Site 421

Phase 1 at Site 421 began with the resurvey and establishment of the site boundary based on the presence of surface artifacts (see Figure 15). All surface artifacts (see Table 3) were point-located and collected individually. Following the surface-artifact collection was the excavation of five east-west-oriented backhoe trenches, at approximately 15-m intervals (see Table 4). The investigation of all trench walls resulted in the identification of 5 buried features across the site. Once each buried feature had been mapped with a total-station and recorded with a scaled, hand-drawn profile, MSUs 4268 and 4342 were excavated on the site. A total area of 4,274 m^2 was mechanically stripped at the site, exposing an additional 129 buried features in plan view (see Figure 19; Table 5). During the mechanical excavation at the site, several of the features appeared to originate at different levels, suggesting that multiple components of occupation were represented at the site. Numerous flaked stone and ground stone tools were also identified at common surfaces during mechanical excavation, similar to those identified during the mechanical excavation at Site 419.

Site 422

Phase 1 at Site 422 began with the resurvey and establishment of the site boundary based on the presence of surface artifacts (see Figure 16). When all surface artifacts (see Table 3) had been point-located and collected individually, a series of four east-west-oriented backhoe trenches were excavated, at 10-m intervals (see Table 4). Each trench wall was inspected for buried cultural materials, resulting in the identification of five buried features. Each feature was mapped with a total-station and recorded with a scaled, hand-drawn profile. Once all features had been mapped, MSU 5212 was excavated in the eastern portion of the site. MSU 5212 totaled 205 m^2 in area and exposed an additional four buried features (see Figure 20; Table 5).

Phase 1 Radiocarbon Results

During Phase 1 investigations, 44 flotation samples, in total, were collected from features at Sites 419, 420, 421, and 422. The sampled features included 21 possible pit structures, 21 extramural pits, and 2 charcoal/ash lenses. Processing of the 44 flotation samples resulted in the identification of numerous charred macrobotanical remains as well as both flaked stone and faunal-bone artifacts (for a more in-depth analysis of the flotation samples, please see Hall et al. [2011:13–19]). Macrobotanical remains collected from 30 of the 44 flotation samples were analyzed by Dr. Karen Adams to determine their taxonomic classifications. Dr. Adams identified several different types of charred plant material, including mesquite (*Prosopis* sp.) wood and seeds, saltbush (*Atriplex* sp.) stems, saguaro (*Carnegeia gigantea*) wood, ocotillo (*Fouquieria splendens*) wood, grass (Poaceae and *Panicum* sp.) stems and seeds, and various herbaceous plants, such as horse purslane (*Portulaca* sp.) and plantain (*Plantago* sp.). Please see Chapter 6, Volume 2, for a full analysis of the paleobotanical record. Twenty-four charred plant specimens (including 8 point-located charcoal samples and 16 pieces of charcoal from flotation samples) were submitted to Aeon Laboratories (Aeon) for Accelerator Mass Spectrometry (AMS) analysis. The results are presented below.

One of the important overall research issues for the Luke Solar project was determining the chronologic components represented on each site. In order to inform the research and Phase 2 field approach and methods, we submitted radiocarbon dates from four of the project sites. In all, 24 charred plant specimens were submitted to Aeon for AMS analysis (Table 6). The resulting dates provided us with a preliminary indication that the project area was occupied intermittently during the Middle Archaic period (3340–2340 cal. B.C.), the Late Archaic/Early Agricultural period (1390–544 cal. B.C.), the Hohokam Pioneer period (cal A.D. 610–680), and the Hohokam Classic period (cal A.D. 1190–1410) (Figure 21). Two other dates (cal A.D. 1430–1634 and cal. A.D. 1523–1795) were obtained from uncharred plant material and may not represent cultural activity; however, if the dates are indicative of cultural materials, then they indicate a possible Protohistoric period (O'odham) component, as well. As shown in Figure 21, there were obvious clusters of Middle and Late Archaic/Early Agricultural period dates, two Pioneer period dates, and Classic period and possible Protohistoric period dates. The 24 Phase 1 radiocarbon dates indicated over 4,000 years of intermittent human occupation on LAFB and were crucial to a preliminary understanding of the ages of occupations within the APE. SRI's Phase 2 investigations were therefore focused on better defining the chronological components represented in the project area. Please see Chapter 2, Volume 2, for the full project chronology and geoarchaeological analysis.

Intersite Trenching

In order to address concerns raised by the Arizona SHPO regarding the full extent and nature of significant buried resources in intersite areas throughout the APE (areas outside the previously identified site boundaries), SRI conducted an additional intersite-testing program for those areas between May 23 and June 9, 2011 (Hall and Wegener 2011). This testing program consisted of an additional 83 trenches totaling 2,166 linear meters of subsurface backhoe trenching placed outside previously defined site boundaries but within the current APE (see Figure 9).

The APE is divided into two parts by Strike Eagle Street, also known as the MSA road (see Chapter 1). The area to the north of Strike Eagle Street is designated Area A, and the area to the south of Strike Eagle Street is designated Area B. For the intersite-trenching program, SRI excavated totals of 868 linear meters of backhoe trench in Area A and 1,298 linear meters of backhoe trench in Area B. Backhoe excavation consisted of trenches placed at both random and judgmental locations throughout Areas A and B. The judgmental locations were designed to assist in determining the extent of archaeological site boundaries. Other trench locations were based on computer-generated, random placement of trenches within the APE (see Chapter 3).

In all, Area A had 33 trenches, for a total of 868 linear meters: 12 judgmental trenches (376 m) and 21 random trenches (492 m). Area B had 50 trenches, for a total of 1,298 linear meters: 21 judgmental trenches (665 m) and 29 random trenches (633 m). This amount of backhoe trenching was considered adequate by the stakeholders to inform on the distribution, extent, and nature of buried archaeological features and deposits throughout the APE.

Intersite-Trenching Results and Site Combination

The excavation of an additional 2,166 linear meters of trench throughout the APE resulted in the identification of 50 buried cultural features in 33 of the intersite trenches (see Figure 9). Fifty of the intersite trenches did not contain features, and those culturally sterile trenches were mainly located in the northeastern and

Table 6. Phase 1 Radiocarbon Dates Obtained from Sites 419, 420, 421, and 422

Feature No.	Feature Type	Plant Specimen	^{14}C B.P.	Error	Calibrated Date Range	Aeon No.	Yield (%)	Total Carbon Mass (mg)	Ratio of ^{13}C to ^{14}C	^{14}C Fraction	Error
					Site 419						
1244	pit	*Atriplex* sp. wood	3030	20	1390–1210 cal. B.C.	681	67.90	0.922	–10.6	0.6859	0.0018
1290	structure	*Atriplex* sp. wood	1390	15	cal. A.D. 640–670	679	68.40	1.122	–10.2	0.8411	0.0016
1303	structure	unknown	3915	15	2480–2340 cal. B.C.	680	17.60	0.406	–20.9	0.6144	0.0011
1307	structure	*Prosopis* sp. wood	2755	20	971–835 cal. B.C.	745	69.50	1.045	–25.5	0.7097	0.0018
1315	structure	*Prosopis* sp. wood	2500	15	768–544 cal. B.C.	744	67.50	0.943	–25.7	0.7325	0.0015
1343	pit	*Prosopis* sp. wood	815	15	cal. A.D. 1190–1264	743	70.00	1.004	–23.8	0.9032	0.0019
1349	pit	*Prosopis* sp. wood	1365	20	cal. A.D. 640–680	674	68.50	0.949	–24.3	0.8435	0.0021
					Site 420						
nonfeature	geologic	*Prosopis* sp. wood	4115	15	2860–2580 cal. B.C.	675	60.20	0.382	–20.3	0.5991	0.0011
2486	charcoal lens	*Prosopis* sp. wood	4055	20	2833–2491 cal. B.C.	736	71.60	1.049	–26.2	0.6038	0.0013
2602	structure	*Atriplex* sp. twig	3975	20	2560–2460 cal. B.C.	737	70.60	1.063	–14.6	0.6095	0.0013
2605	structure	*Prosopis* sp. wood	3955	20	2567–2350 cal. B.C.	738	64.80	0.848	–25.6	0.6112	0.0016
2622	structure	*Atriplex* sp. wood	3970	15	2560–2460 cal. B.C.	741	62.70	0.809	–14.8	0.61	0.0012
2627	structure	*Prosopis* sp. wood	2655	15	840–800 cal. B.C.	740	75.90	0.964	–24.8	0.7188	0.0015
2628	structure	*Atriplex* sp. wood	2685	15	840–800 cal. B.C.	742	65.00	0.977	–14.0	0.7157	0.0014
2630	structure	*Prosopis* sp. wood[a]	270	20	cal. A.D. 1523–1795	739	20.90	0.204	–22.3	0.9672	0.0026
					Site 421						
4235	pit	*Prosopis* sp. wood	4490	15	3340–3090 cal. B.C.	676	56.70	0.951	–23.1	0.5718	0.0012
4287	pit	*Prosopis* sp. wood	2835	15	1050–920 cal. B.C.	677	64.80	0.804	–21	0.7026	0.0013
4302	structure	*Prosopis* sp. wood	2885	15	1130–1000 cal. B.C.	678	71.50	1.003	–22.7	0.6982	0.0013
4308	structure	*Prosopis* sp. wood	2805	15	1010–920 cal. B.C.	748	68.70	0.946	–26.1	0.7054	0.0014
4343	pit	*Prosopis* sp. seed	2835	15	1045–926 cal. B.C.	749	67.80	1	–23.8	0.7024	0.0015
4355	structure	*Prosopis* sp. wood	2860	15	1110–1000 cal. B.C.	750	64.90	0.799	–25.8	0.7004	0.0014
4388	structure	*Prosopis* sp. seed	4320	20	3011–2892 cal. B.C.	747	57	0.529	–22.9	0.5842	0.0013
4409	pit	*Portulaca* sp. seed[a]	400	45	cal. A.D. 1430–1634	746	34.70	0.034	–46.9	0.9514	0.005
					Site 422						
5213	pit	*Atriplex* sp. seed	595	25	cal. A.D. 1298–1410	735	61.80	0.169	–12.7	0.9288	0.0029

[a] Dates were obtained from unburned plant material and may not reflect cultural activity.

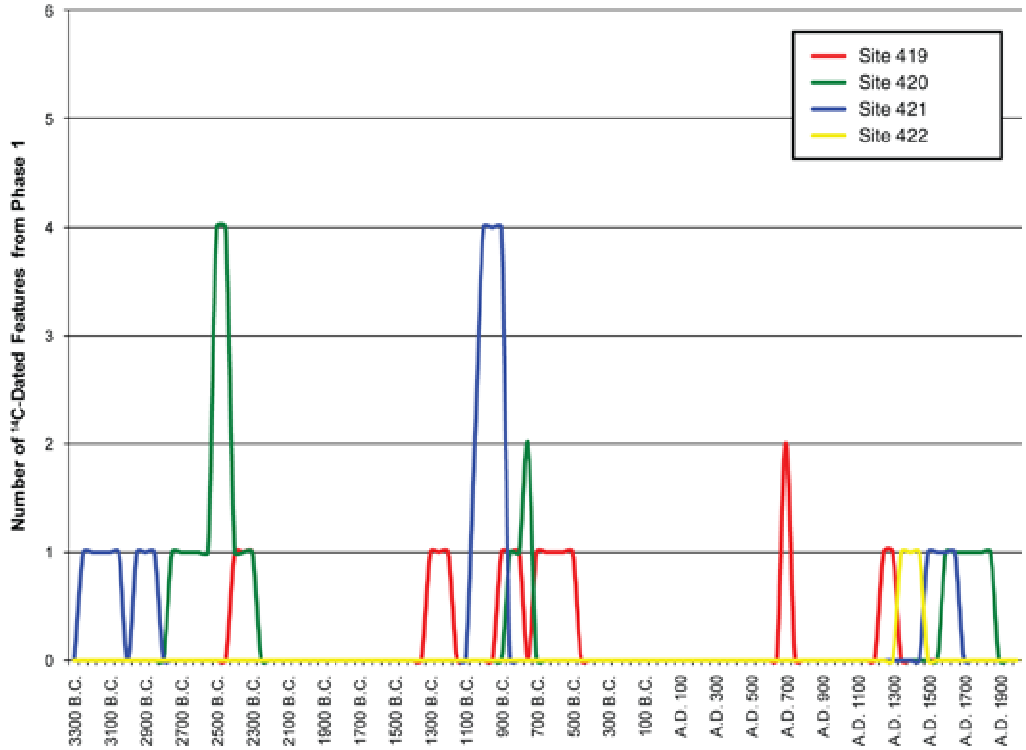

Figure 21. Age distribution of the 24 Phase 1 radiocarbon-dated features at Site 419.

southwestern portions of the APE. The features identified in intersite areas included 34 pits, 11 possible pit structures, 2 charcoal/ash lenses, 2 middens, and a modern concrete foundation.

The results of the intersite trenching demonstrated that the extent of buried cultural resources in the APE encompassed all of Sites 419, 420, 421, and 422, as well as the intervening areas between sites across Areas A and B. Therefore, a new, provisional boundary of buried cultural resources encompassing an area approximately 44 acres in size was established. Site 423 was located to the west of the provisional boundary, and several trenches to the north and east of the Site 423 boundary did not contain buried features. Site 423, therefore, was not included in the site combination. Furthermore, because only a small portion of Site 68 extended into the APE, it was considered inappropriate to incorporate the entirety of the site, based on the limited investigations within the current APE; therefore, Site 68 was also not included in the site combination. On August 11, 2011, SRI alerted ASM Information Technology Manager Rick Karl that four of the sites associated within the Luke Solar project (Sites 419, 420, 421, and 422) were being combined into one large site. AZ T:7:419 (ASM) was the lowest of the ASM site numbers assigned to the project, not including the site number for Site 68, which had been assigned its ASM number previously by Adams (1991); therefore, AZ T:7:419 (ASM) was used as the all-encompassing site designation for the entire 44-acre footprint of buried cultural resources within the APE. AZ T:7:420 (ASM), AZ T:7:421 (ASM), and AZ T:7:422 (ASM) are henceforth no longer used. Furthermore, the all-encompassing AZ T:7:419 (ASM) has been named Falcon Landing and will be referred to as such.

Only one intersite trench located outside the newly combined Falcon Landing boundary contained a buried cultural feature. Located to the east of Falcon Landing, across a small drainage, Trench (TR) 10069 contained a single thermal pit identified in trench profile. An area approximately 0.5 acres in size surrounding TR 10069 was mechanically stripped during Phase 2 data recovery, resulting in the identification of numerous features and, hence, a new archaeological site: Site 437 (see Chapter 7). There were, however, several other features identified in trench profiles during the intersite-trenching phase, outside the newly combined Falcon Landing boundary. In order to evaluate those features, MSUs were excavated over them. In total, three MSUs were excavated outside site boundaries during Phase 2. One MSU was located in the far-western portion of Area B, another was located north of Site 437, and a third was located in Area A, east of Falcon Landing and adjacent to a drainage (Figure 22). The features identified in profile in these intersite trenches were determined through mechanical excavations to be noncultural phenomena (e.g., root burn); therefore, no further work was done in those areas, and no other sites were designated.

A Note on Combining Phase 1 Provenience-Designation Numbers

Combining Sites 419, 420, 421, and 422 wasn't just a matter of changing the site boundaries on the project maps. A complex process of changes to the project database, the paperwork, the artifact bags, etc., was involved. The most conspicuous of these changes included the combining of provenience-designation numbers for each of the sites. During Phase 1, each site within the APE had a unique set of provenience-designation numbers assigned to it, beginning with 1 and running consecutively (for a more in-depth discussion of the provenience-designation system, please see Chapter 3). Feature numbers are also designated within that system; so, each feature number is also a unique provenience-designation number. During Phase 1, all sites had an independent list of features assigned per site. In some cases, multiple sites would have similar feature numbers. For example, during Phase 1, Sites 419 and 420 each had a Feature 290. When the sites were combined, these overlapping numbers needed to be resolved in order to have consistent data flow for the project. To reconcile the problem, each of the four sites being combined had a scaled 1,000 integer added to the beginning of each of its provenience-designation numbers. Site 419, with the lowest of the Phase 1 site numbers, had "1,000" added to each provenience-designation number. Site 420 had over a thousand provenience-designation numbers; therefore, "2,000" was added to provenience-designation numbers 1–999, and "3,000" was added to the remaining provenience-designation numbers. Site 421 had "4,000" added to each provenience-designation number, and Site 422 had "5,000" added to each provenience-designation number. As a result, Feature 290 at Site 419 became Feature 1290 at Falcon Landing, and Feature 290 at Site 421 became Feature 4290 at Falcon Landing. All Phase 1 proveniences were converted prior to the beginning of Phase 2 data recovery. The following chapters and those in Volume 2 present the results of SRI's archaeological excavations and analysis but will not refer to the original Phase 1 numbers. Instead, all following discussions will refer to the updated provenience and feature numbers following the Falcon Landing combination.

Phase 2 Data Recovery

The results of SRI's Phase 1 investigations and consultation among stakeholders determined that Phase 2 data recovery was required prior to the construction of the solar-power array. The following sections present SRI's Phase 2 data recovery results for Falcon Landing.

SRI's data recovery was completed in two stages, known informally as Phase 2.1 and Phase 2.2. Phase 2.1 data recovery was completed under contract with LAFB and began on September 19, 2011. On February 9, 2012, the project was temporarily suspended because of the expiration of the contract with LAFB. SRI resumed data recovery efforts on November 5, 2012, as a subconsultant to Aerostar. Phase 2 fieldwork concluded on April 25, 2013. For the following discussion, Phase 2.1 and Phase 2.2 data recovery efforts are considered the same effort, and whenever possible, the results of these two stages of fieldwork have been combined.

Mechanical Excavations

One of the main goals for Phase 2 was the large-scale exposure of buried cultural resources at Falcon Landing. This was accomplished by mechanical stripping (for a more in-depth discussion of the mechanical-stripping

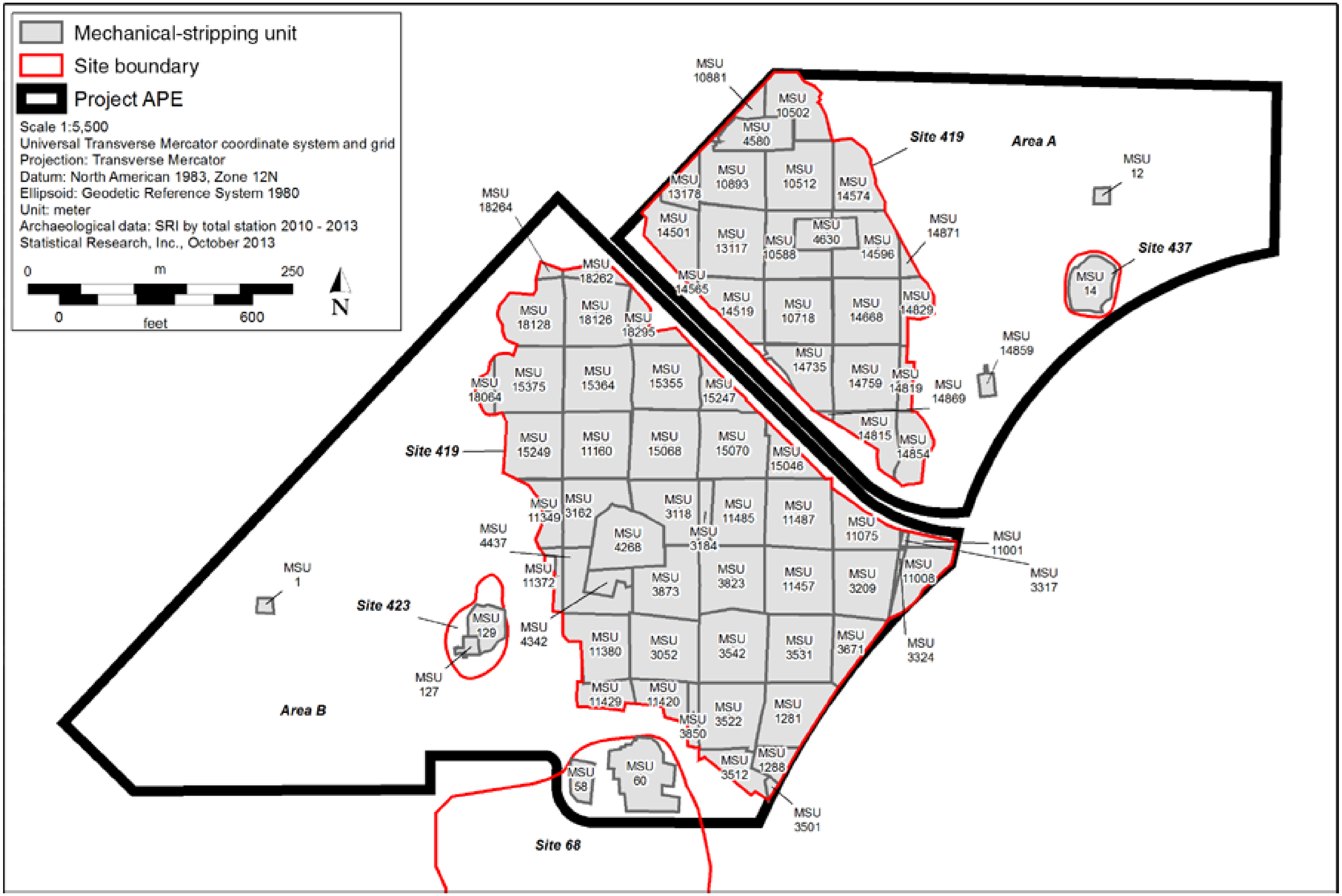

Figure 22. Map showing the locations of all MSUs within the Luke Solar APE. (Note: MSU 5212 is depicted in Figure 20 and was encompassed by MSU 15046 during Phase 2).

equipment and methods, please see Chapter 3). In total, 72 MSUs (not including MSU 5212) were excavated at Falcon Landing, most conforming to a 1-acre grid established prior to the start of Phase 2 fieldwork (see Figure 22). Utilizing the 1-acre grid allowed for a more controlled method of mechanically excavating such a large site. An interactive pdf file (see Appendix A) shows the alphanumeric grid established over Falcon Landing, as well as the entirety of SRI's archaeological excavations during the Luke Solar project.

Overall, 43.6 acres (176,326 m^2) were mechanically excavated to an average depth of about 40 cm at Falcon Landing. This resulted in the removal of approximately 67,000 m^3 of sediment over a period of 38 weeks. The first 17 weeks of mechanical stripping (Phase 2.1) was accomplished with one trackhoe and one backhoe. The trackhoe worked exclusively in Area B, and the backhoe worked in a variety of locations, including Sites 68, 423, and 437. By the end of Phase 2.1, 12.37 acres, in total, were mechanically excavated at Falcon Landing. Mechanical stripping was resumed during Phase 2.2 with two trackhoes, one in Area A and one in Area B. Phase 2.2 mechanical stripping lasted 21 weeks and uncovered a total of 31.23 acres in both Areas A and B.

Manual Feature Sampling

Within the 43.6-acre mechanically excavated footprint of Falcon Landing, 3,006 cultural features, in total, were found. As stated in the HPTP (Hall et al. 2011:49), SRI was contracted to manually excavate a 50 percent sample of all cultural features, per feature type, function, and temporal component, within the APE. During Phase 2 data recovery at Falcon Landing, SRI excavated a controlled sample of 1,638 features, or about 55 percent of the total (Table 7).

Site Closure

Between April 10 and 25, 2013, SRI conducted site closure at Falcon Landing. Once the feature sampling was complete, the remaining unexcavated features were examined to ensure that all burials and mortuary items were cleared from the APE prior to construction. The examination of a feature was carried out by manually removing the fill and inspecting the feature for human remains or mortuary items. If no burial was present, then the type of feature was evaluated and documented (e.g., thermal pit or nonthermal pit). In total, 1,368 cultural features were examined at Falcon Landing during site closure (see Table 7): 8 charcoal/ash lenses, 17 FAR concentrations, 1,283 nonthermal pits (including 8 bell-shaped pits), 59 thermal pits (including 1 bell-shaped pit), and 1 possible structure. In addition, 53 features were examined and turned out to be noncultural features, such as root burns, rodent disturbances, etc., increasing the total number of examined features to 1,421. None of the 1,421 examined cultural or noncultural features at Falcon Landing contained any human remains or mortuary items. The conclusion of site closure marked the end of SRI's field data recovery efforts for the Luke Solar project.

Geochronology and Analytical Units

According to the HPTP (Hall et al. 2011:49), analytical units are defined as discrete clusters of structures and associated extramural features or as discrete clusters of extramural features. These analytical units were included in the HPTP in order to better identify spatially associated features that may represent the activities of household or communal social units. Defining households is important for addressing the research questions, because it allows for the potential study of spatial/social organization and the types of activities that occurred at a site. During Phase 1 testing of Sites 419 and 421 (see discussion above), several conspicuous clusters of features were recognized during mechanical stripping (see Figures 17 and 19). These feature clusters were interpreted as potential analytical units, because they represented possible structures and spatially associated sets of extramural features. Subsequent Phase 1 radiocarbon dates indicated that these feature

Table 7. Numbers of Excavated Features and Corresponding Levels of Effort at Falcon Landing

Feature Type	Level of Effort				Total
	Examined	Complete	Partial	Sampled	
Activity area[a]	—	8	6	—	14
Burial	—	1	—	—	1
Cache	—	14	3	2	19
Charcoal/ash lens	8	3	33	21	65
FAR concentration	17	13	44	35	109
House-in-pit	—	40	—	—	40
Midden	—	—	2	—	2
Nonthermal pit	1,275	106	443	549	2,373
Nonthermal pit (bell shaped)	8	9	7	1	25
Posthole[b]	—	6	—	3	9
Reservoir	—	—	1	—	1
Structure (possible)	1	—	—	3	4
Surface structure	—	4	—	—	4
Thermal pit	58	139	78	55	331
Thermal pit (bell shaped)	1	6	2	1	9
Total	1,368	349	619	670	3,006

[a] Includes one activity surface.

[b] The six completely excavated postholes were associated with activity-area Feature 1337, as described in this chapter. The three sampled postholes were associated with a charcoal/ash lens (Feature 2537) not described in this text. These three sampled postholes were circular in plan view and basin-shaped in cross section and measured 0.18–0.25 m in diameter and 0.04–0.07 m in depth.

clusters may be spatially associated but are not temporally associated (see Table 6). For example, adjacent features may have an age difference of several thousand years. This occupation palimpsest was encountered across the entire site. So, the application of analytical units was modified to include contemporaneous features that may or may not be spatially associated (for a more in-depth discussion of site structure, social organization, and land use, see Chapter 10, Volume 2).

Stratigraphy and Geochronology

The natural stratigraphic units at Luke Solar represented alluvial deposition along distal White Tank Mountain piedmont, ephemeral fan-drainage networks. The late Quaternary sediments were not deeply stratified but had a high degree of lateral complexity with many inter-fingering and overlapping deposits. Because of this complexity, the site stratigraphy was defined using an allostratigraphic model, which separates depositional units based on their major bounding unconformities. The unconformities were traced laterally using soil morphology, stratigraphic position, surficial geologic mapping, lithological characteristics, and radiocarbon dating. The final project geochronology contains five major Holocene stratigraphic units identified from oldest to youngest as Units I–V (Figure 23). Units II and III were further subdivided into members IIA, II s/sf (swale fills and sheet floods), III1, III2, and III2cf (channel fan) based on radiocarbon age and soil stratigraphic relationships (Table 8). A late Pleistocene buried soil underlying the Holocene units across the project area was identified as the Litchfield Ranch Formation.

At the conclusion of fieldwork, charcoal from cultural features and nonfeature contexts were chosen for radiocarbon analysis. Nonfeature contexts include stratigraphic columns where charcoal was obtained from important depositional boundaries. Individual features were selected for radiocarbon dating based judgmentally on their contents, stratigraphic positions, or feature types. For example, if a feature was located at an

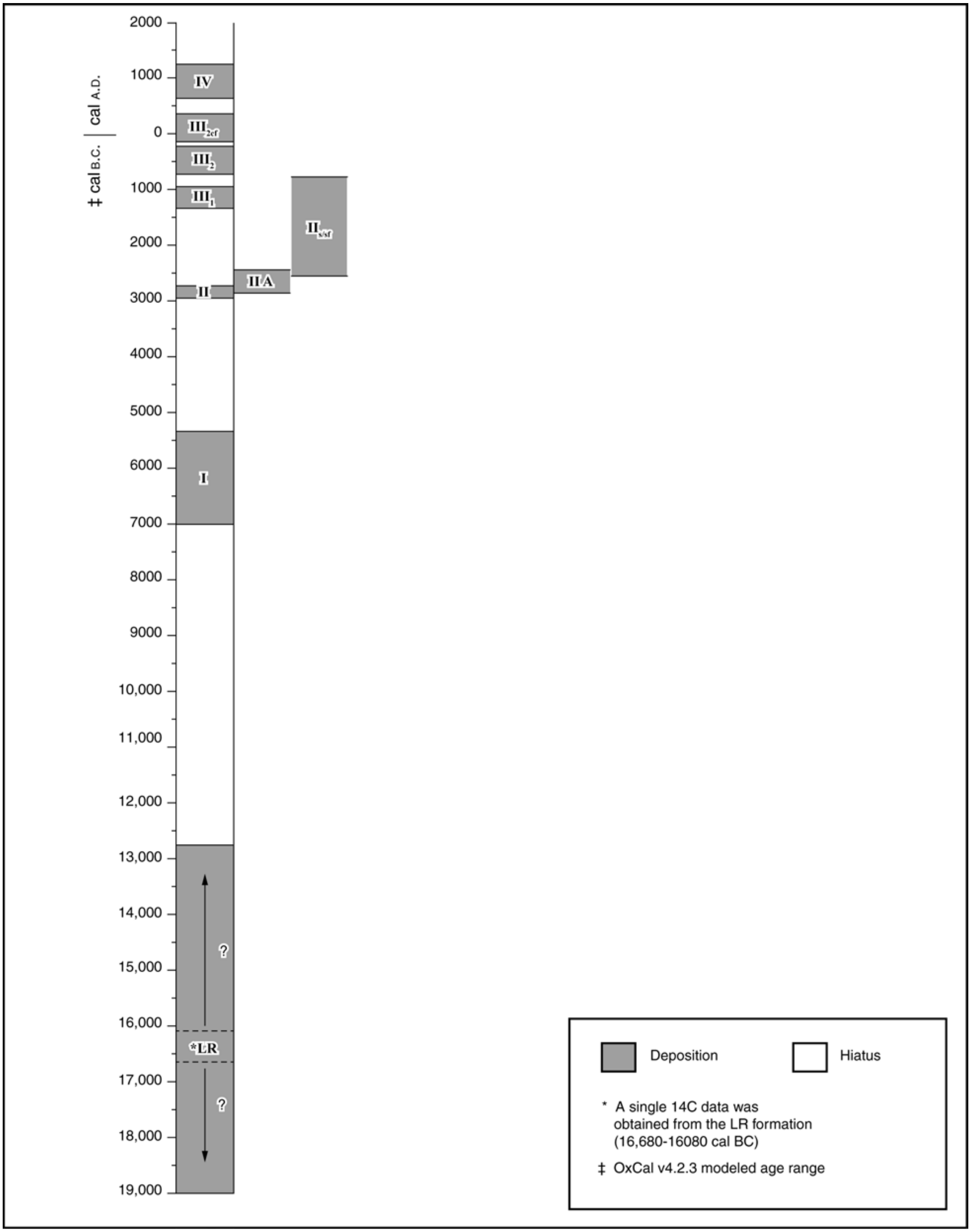

Figure 23. Graph showing the stratigraphic units defined in the Luke Solar project area, the relative duration of deposition for each unit, and periods of stability.

Table 8. Geochronology and Natural Strata at Falcon Landing

Natural Stratum	Natural-Stratum Age	Description
Litchfield Ranch Formation	18,000–12,700 cal. B.C.	Widespread late Pleistocene alluvial-fan deposit; Bk-Btk soil-horizon sequence; Stage II–II+ pedogenic carbonates and discontinuous clay films on ped surfaces. A single radiocarbon date from the Litchfield Ranch Formation yielded an uncalibrated age of 15,150 ± 70 ^{14}C yr B.P. (16,680–16,080 cal. yr B.C.). No cultural features were associated with this stratum.
Unit I	7040–5320 cal. B.C.	Widespread early Holocene alluvial-fan deposit; basal deposits are coarser grained and contain up to 15 percent gravel; grades upward to a silt loam; ABk-Bk-BC soil-horizon sequence; Stage I–I+ pedogenic carbonates.
Unit II	2970–2730 cal. B.C.	Middle to late Holocene alluvial-fan deposit; sandy loams at base, grading up to silt loams; Bk soil horizon with Stage I pedogenic carbonates where situated near the modern surface; Stage I– or no visible carbonates where buried.
Unit IIA	2810–2420 cal. B.C.	Middle to late Holocene alluvial-fan sheet-flood deposit; darker-colored, over-thickened silt loam ABk soil horizon capping Unit II; Stage I or I– pedogenic carbonates.
Unit IIA/IIs/sf	2810–790 cal. B.C.	Undifferentiated late Holocene alluvial-fan and fan-swale deposits.
Unit IIs/sf	2570–790 cal. B.C.	Secondary late Holocene alluvial-fan swale/channel fills and sheet-flood deposits; laminated silt loams and sandy loams in swales; sandy loams grading up to silt loams in channels; A-Bw-C or A-Bk-C soil-horizon sequence; Stage I– carbonates or no visible carbonates.
Unit IIs/sf/Unit III1	2570–920 cal. B.C.	Undifferentiated late Holocene alluvial-fan deposits.
Unit III1	1380–920 cal. B.C.	Localized late Holocene discontinuous ephemeral-channel and channel-fan deposits; sandy loam at the base of the channel and channel fan, grading up to silt loam; A-Bw or A-Bk soil-horizon sequence; early Stage I pedogenic carbonates.
Unit III1/Unit III2	1380–200 cal. B.C.	Undifferentiated late Holocene Unit III alluvial-fan deposits.
Unit III2	720–200 cal. B.C.	Late Holocene alluvial-fan deposit; sandy loam channel fills contain up to 15 percent gravel; silt loam sheet-flood deposits; A-Bw or A-Bk soil-horizon sequence; pedogenic carbonates range from incipient Stage I to no visible carbonates.
Unit III2/ Unit IV	720 cal. B.C.– cal. A.D. 1220	Undifferentiated late Holocene alluvial-fan deposits.
Unit III2cf	160 cal. B.C.– cal. A.D. 340	Localized late Holocene silt loam channel-fan deposits; A-Bw soil-horizon sequence; incipient Stage I pedogenic carbonates or no visible carbonates.
Unit III2cf/ Unit IV	160 cal. B.C.– cal. A.D. 1220	Undifferentiated Late Holocene alluvial-fan deposits.
Unit IV	cal A.D. 610–1220	Late Holocene discontinuous ephemeral-channel and channel-fan deposits; primarily silt loam sheet-flood deposits in the project area; A-C or A-Bw soil-horizon sequence; no visible pedogenic carbonates.
Unit V	cal A.D. 1520–1800	Widespread latest Holocene or Historical period silt loam sheet-flood deposits directly below the modern surface; C horizons; no visible pedogenic carbonates.

important stratigraphic boundary and contained ample charred plant material, then it was considered a good candidate for radiocarbon dating. Alternatively, if a feature contained a diagnostic artifact (e.g., a projectile point or ceramic sherd) as well as abundant charred plant material, then that feature was also considered a good candidate for radiocarbon dating. A feature located at a stratigraphic boundary could, therefore, provide a direct date for the feature as well as provide a depositional (stratigraphic) date that could help build the geochronologic model (see Figure 23). As a result of this radiocarbon dating procedure, each depositional unit identified within the Luke Solar APE was assigned a radiocarbon age range (see Table 8). For a more in-depth discussion of the natural stratigraphy and geochronology of the Luke Solar project area, please see Chapter 2, Volume 2.

Based on the natural stratigraphy within the APE, a geochronological model has been applied to all features at Falcon Landing. The results of the geochronology and radiocarbon dating were used to place features into chronologic groups (i.e., chronologic component), and each chronologic component can be considered an analytic unit. In total, 34 chronologic components are present at Falcon Landing, extending from the Early Archaic period to the Historical period (Table 9), and each chronological component corresponds to the culture history presented in Chapter 2. Assigning features to chronologic components required several steps. First, features that were individually radiocarbon dated have a specific and precise age range obtained from the radiocarbon analysis. This radiocarbon date was preferable over all other dating methods. Second, features were dated stratigraphically, using the geochronologic model (see Table 8) that was developed by directly or indirectly dating the natural stratigraphy on a site (see Chapter 2, Volume 2). If a feature was not radiocarbon dated, then it was given the age range of its associated natural stratum (Units I–V). In some cases, a feature was coeval with a natural stratum (i.e., present within a single stratum) and was assigned a bracketing age range for that particular stratum (see Table 9). Other features were intrusive into the upper surface of a stratum, with a younger stratum overlying the surface, creating an unconformity. In the case of an unconformity, the feature was assigned the latest date for the stratum it intruded and the earliest date for the overlying stratum. Sometimes this unconformity date range was quite long, making the age assigned to a particular feature very broad (for a more in-depth discussion of the natural stratigraphy and chronological groups at Falcon Landing, see Chapter 2, Volume 2). The following feature descriptions are assembled per chronologic component.

Feature Descriptions

Over 3,000 features were preserved with the portion of Falcon Landing located within the APE. Feature types identified at Falcon Landing included activity areas, a burial, caches, charcoal/ash lenses, FAR concentrations, middens, thermal and nonthermal pits (both basin and bell shaped), structures, and a possible reservoir. The following sections include a physical description of each structure, activity area, midden, burial, and reservoir. Because of the large number of nonarchitectural extramural features identified at Falcon Landing (e.g., caches, charcoal/ash lenses, FAR concentrations, and thermal and nonthermal pits), not every feature can be individually described. Instead, each of these feature types will be defined and summarized, and representative feature(s) from each of these feature categories will be individually described in the text. The remaining features (those not individually described in the text) are presented in summary tables for each feature type. Because of the overwhelmingly large numbers of thermal and nonthermal pits, the summary table for pits was too large to place within the text. Therefore, the extramural-pit summary is presented in Appendix C.

Architecture

The architecture preserved at Falcon Landing generally consisted of ephemeral, shallow structure foundations that contained few identifiable architectural elements, such as postholes, entryways, walls, prepared floors, and hearths. The lack of these architectural elements may be due in part to postabandonment disturbances.

Table 9. Number of Features per Chronologic Component at Falcon Landing

Chronologic Groups	Date Range	Total No. of Features
Early to Middle Archaic period	9500–1200 B.C.	108
Early to Late Archaic period	9500 B.C.–A.D. 50	181
Early Archaic to Pioneer period	9500 B.C.–A.D. 400	98
Early Archaic to Protohistoric period	9500 B.C.–A.D. 1800	1
Chiricahua phase	3500–2100 B.C.	706
Middle to Late Archaic period	3500 B.C.–A.D. 50	614
Middle Archaic to Pioneer period	3500 B.C.–A.D. 750	265
Middle Archaic to Protohistoric period	3500 B.C.–A.D. 1800	155
Late Chiricahua phase	2100–1200 B.C.	7
San Pedro phase	1200–800 B.C.	20
Late Archaic period	1200 B.C.–A.D. 50	6
Late Archaic to Pioneer period	1200 B.C.–A.D. 750	155
Late Archaic to Classic period	1200 B.C.–A.D. 1450	2
Late Archaic to Protohistoric period	1200 B.C.–A.D. 1800	97
Early Cienega phase	800–400 B.C.	6
Cienega phase	800 B.C.–A.D. 50	64
Late Cienega phase	400 B.C.–A.D. 50	2
Late Cienega to Red Mountain phase	400 B.C.–A.D. 450	183
Red Mountain phase	A.D. 50–400	3
Early Ceramic to Pioneer period	A.D. 50–750	5
Early Ceramic to Protohistoric period	A.D. 50–1800	42
Pioneer period	A.D. 400–750	1
Pioneer to Classic period	A.D. 400–1450	102
Snaketown phase	A.D. 650–750	4
Sacaton phase	A.D. 1000–1150	4
Sedentary to Classic period	A.D. 1000–1450	1
Soho/Civano phase	A.D. 1150–1450	2
Classic to Protohistoric period	A.D. 1150–1800	28
Protohistoric period	A.D. 1450–1800	1
Post–Middle Archaic period	post–3500 B.C.	39
Post–Late Archaic period	post–1200 B.C.	90
Post-Soho phase	post–A.D. 1150	9
Post–early Historical period	post–A.D. 1700	4
Historical period	A.D. 1800–1950	1
Total		3,006

Rodent, insect, and root activity were common and intensive disturbances to these shallowly buried features. In total, 48 structures were identified at Falcon Landing (Table 10). Two types of structures were identified: house-in-pit structures (n = 40) and surface structures (n = 4). Additionally, 4 possible structures were identified in the profiles of trenches but could not be defined (i.e., assigned to feature types) during subsequent mechanical excavations. These possible structures were sampled whenever possible, but their sizes, shapes, and interior characteristics were not observable. No true pit houses, such as those associated with the Hohokam culture, were identified in the project area.

A house-in-pit structure is an architectural feature that is fully contained within a shallow pit. The walls of the house-in-pit type are represented by a line of perimeter posts, a perimeter floor groove, or both. In several instances, structures at Falcon Landing consisted of shallow pits but did not have definable postholes. These types of structures are still considered houses-in-pits, with the assumption that a posthole pattern existed within the aboriginal pit but could not be defined, because of postabandonment processes. Surface structures, on the other hand, are architectural features built directly on the aboriginal ground surface, such as a ramada. A surface structure is defined by an arrangement of postholes that do not have an associated aboriginal pit excavation. The following presents a physical description of each structure identified at Falcon Landing.

Early to Late Archaic Period Component

Feature 1313

Structure type: house-in-pit
Age: Early to Late Archaic period
Locus: Area B
Grid location: B4
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m²): 4.97
Effective floor area (m²): 4.39
Orientation: indeterminate
Length (m): 3.41
Width (m): 2.05
Excavated depth (m): 0.11
Volume (m³): 0.610

Excavation Methods

Feature 1313 was a possible house-in-pit that dated to the Early to Late Archaic period (see Table 10). The structure was identified during mechanical stripping as an organic, ovate stain in MSU 1281 (see Appendix A). A 1-by-2-m control unit (Test Pit [TP] 5585) was first excavated near the center of the stain. The remainder of the structure fill was removed in three sections (SECs 5618, 5629, and 5662) (Figure 24).

The control unit and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. Because of shallow depth and lack of stratigraphy, TP 5585, SEC 5618, and SEC 5662 were excavated in a single level to the structure floor. SEC 5629 was excavated in two levels; Level 1 was arbitrarily terminated at approximately 0.1 m in depth, and Level 2 ended at the structure floor.

Feature Fill

A single stratum was present in Feature 1313. It was a soft, yellowish brown silty loam containing gravels from natural deposition that occurred after structure abandonment, as well as a sparse amount of charcoal. Artifacts in the fill increased with depth and included 1 piece of FAR, 1 faunal bone, 14 pieces of flaked stone debitage, and 1 indeterminate ground stone fragment (see Table 10). Pollen and macrobotanical samples from structure fill were submitted for analyses. A second pollen sample from the structure floor was also analyzed (see Chapters 6 and 7, Volume 2).

Table 10. Falcon Landing Structure Data

Feature No., by Structure Occupational Age	Structure Type	Intramural Features (n)		Structure Dimensions (m)			Structure Volume (m³)	Floor Area (m²)		Entry		Flaked Stone (n)	Ground Stone (n)	Faunal Remains (n)	Ceramics (n)	Expedient Use[a] (n)	Total (n)	Artifact Density (n/m³)[b]
		Pits	Postholes	Length	Width	Depth		Total	Effective	Type	Orientation							
Early to Late Archaic period																		
1313	house-in-pit	—	3	3.41	2.05	0.11	0.610	4.97	4.39	IND	IND	14	3	1	—	2	20	32.68
Chiricahua phase																		
2602	house-in-pit	14	45	6.61	6.45	0.55	20.780	32.34	25.90	protruding	northeast	26	130	21	—	32	209	10.06
2605	house-in-pit	6	18	5.10	3.90	0.52	9.860	16.96	14.77	IND	IND	5	27	3	—	14	49	4.97
2622	possible structure	—	—	2.90	IND	0.17	IND	IND	IND	IND	IND	—	—	4	—	1	5	IND
2623	possible structure	—	—	1.85	IND	0.14	IND	IND	IND	IND	IND	—	—	—	—	—	—	IND
2821	possible structure	—	—	2.00	IND	0.08	IND	IND	IND	IND	IND	—	—	4	—	1	5	IND
4387	house-in-pit	1	10	2.80	2.60	0.35	1.650	4.60	4.32	IND	IND	10	—	1	—	—	11	6.66
4388	house-in-pit	3	15	2.95	2.14	0.10	0.630	4.16	3.71	IND	IND	2	1	2	—	—	5	7.90
14613	house-in-pit	1	10	3.48	3.40	0.16	1.420	6.26	5.72	IND	IND	—	2	—	—	4	6	4.24
14614	house-in-pit	—	1	2.45	2.05	0.20	0.680	2.25	2.24	IND	IND	1	—	7	—	—	8	11.73
15113	house-in-pit	1	—	2.20	2.10	0.14	0.450	3.01	2.69	IND	IND	—	—	—	—	—	—	IND
Middle to Late Archaic period																		
3521	house-in-pit	2	13	3.80	3.00	0.14	1.200	7.31	7.00	IND	IND	2	—	3	—	—	5	4.16
4349	house-in-pit	2	6	2.45	2.00	0.13	0.550	3.56	3.42	IND	IND	178	—	55	—	—	233	427.52
8561	surface structure	—	4	4.40	2.20	0.00		6.76	6.75	IND	IND	6	—	1	—	—	7	IND
14948	house-in-pit	—	1	1.90	1.62	0.22	0.530	2.29	2.26	IND	IND	3	1	—	—	—	4	7.58
14949	house-in-pit	—	—	1.60	1.50	0.30	0.580	1.82	1.81	IND	IND	2	—	—	—	—	2	3.45
17681	house-in-pit	—	—	2.50	1.60	0.35	1.080	3.27	3.27	IND	IND	—	3	—	—	17	20	18.61
Middle Archaic to Pioneer period																		
11105	surface structure	—	25	5.25	5.20			16.68	16.35	open	IND	1	—	—	—	—	1	IND
Middle Archaic to Protohistoric period																		
2632	house-in-pit	2	—	2.41	IND	0.22	0.910	2.43	2.31	IND	IND	—	—	5	—	—	5	5.49
Late Chiricahua phase																		
1244	house-in-pit	4	6	4.50	4.10	0.16	2.000	10.83	9.12	protruding	east	57	7	15	—	4	83	41.54
1498	house-in-pit	2	56	2.83	1.57	0.05	0.340	3.71	3.50	protruding	northeast	22	5	1	—	—	28	82.35
2642	house-in-pit	1	—	3.21	IND	0.13	0.690	3.22	3.22	IND	IND	—	—	13	—	—	13	18.73
10114	house-in-pit	1	—	1.90	IND	0.29	0.550	1.15	1.12	IND	IND	17	3	6	—	10	36	110.09
11229	house-in-pit	—	—	3.02	2.65	0.09	0.540	5.64	5.64	IND	IND	5	2	—	—	—	7	13.06
San Pedro phase																		
2627	house-in-pit	2	12	2.74	IND	0.15	IND	2.63	2.44	IND	IND	8	4	1	—	8	21	IND
2628	house-in-pit	2	26	2.83	IND	0.14	0.950	3.94	3.23	protruding	northeast	10	2	5	—	9	26	27.28
2629	house-in-pit	2	12	2.50	IND	0.12	0.820	4.68	4.03	IND	IND	5	1	—	—	3	9	10.98
2967	house-in-pit	—	—	IND	1.77	0.16	0.410	1.39	1.39	IND	IND	1	—	—	—	—	1	2.42
4302	house-in-pit	3	16	2.30	IND	0.09	0.680	4.69	4.17	IND	IND	137	—	30	—	1	168	245.61
4308	house-in-pit	1	3	2.20	1.74	0.17	0.540	2.30	1.78	IND	IND	15	5	12	—	46	78	143.38
11181	house-in-pit	2	—	1.82	1.80	0.10	0.050	2.51	2.24	flush	southeast	—	—	—	—	26	26	553.19
13071	house-in-pit	2	7	3.40	3.15	0.13	1.070	7.04	6.20	IND	IND	8	5	1	—	82	96	90.14
18192	house-in-pit	2	—	2.30	2.00	0.24	0.900	3.20	2.50	IND	IND	9	—	17	—	—	26	28.89
18887	house-in-pit	1	—	2.54	IND	0.18	0.430	1.10	0.72	IND	IND	—	—	1	—	—	1	2.33
Late Archaic to Pioneer period																		
10615	house-in-pit	—	1	2.78	2.13	0.59	2.670	4.18	4.18	IND	IND	153	7	30	—	131	321	120.36

Feature No., by Structure Occupational Age	Structure Type	Intramural Features (n)		Structure Dimensions (m)			Structure Volume (m^3)	Floor Area (m^2)		Entry		Flaked Stone (n)	Ground Stone (n)	Faunal Remains (n)	Ceramics (n)	Expedient Use[a] (n)	Total (n)	Artifact Density (n/m^3)[b]
		Pits	Postholes	Length	Width	Depth		Total	Effective	Type	Orientation							
Cienega phase																		
1413	house-in-pit	—	—	3.00	2.40	0.24	1.470	5.68	5.68	IND	IND	31	—	6	—	—	37	25.15
Late Cienega phase																		
4621	surface structure	—	15	4.12	3.36	0.27	3.650	10.56	9.91	IND	IND	2	2	9	—	3	16	4.39
Late Cienega to Red Mountain phase																		
2529	house-in-pit	—	2	3.26	2.40	0.24	0.320	4.22	4.22	IND	IND	12	2	10	—	59	83	256.17
14702	house-in-pit	3	12	2.95	2.10	0.14	0.660	3.37	2.99	flush	southeast	18	—	8	—	42	68	103.19
17904	house-in-pit	1	2	2.20	IND	0.18	0.620	2.93	2.57	IND	IND	10	—	2	—	15	27	43.83
17908	house-in-pit	2	—	2.20	1.82	0.12	0.360	2.67	2.27	IND	IND	19	10	20	—	42	91	256.34
Red Mountain phase																		
3963	house-in-pit	2	14	4.04	3.86	0.20	2.750	11.45	11.15	protruding	northeast	161	3	12	6	1	183	66.64
10849	house-in-pit	1	—	3.26	2.60	0.12	0.980	7.86	7.62	IND	IND	3	8	8	—	49	68	69.39
Early Ceramic to Protohistoric period																		
10735	house-in-pit	—	3	3.25	2.32	0.13	0.720	5.19	5.03	IND	IND	86	3	7	—	—	96	133.33
Snaketown phase																		
1290	house-in-pit	1	5	IND	2.20	0.21	1.140	2.50	2.42	IND	IND	90	—	25	—	—	115	101.23
3321	house-in-pit	2	14	5.80	4.80	0.14	3.060	18.14	17.60	IND	IND	6	—	2	—	—	8	2.62
Pioneer to Classic period																		
3322	surface structure	—	6	3.08	2.88	0.01	0.070	4.62	4.55	IND	IND	—	—	—	—	—	—	IND
Protohistoric period																		
2630	possible structure	—	—	3.40	IND	0.51	IND	IND	IND	IND	IND	—	—	9	—	—	9	IND

Note: Artifact data include information for all artifacts from structure fill and floor.
Key: IND = indeterminate.
[a] The Expedient Use category includes FAR and manuports.
[b] Artifact-density calculations are based on level of effort; therefore, partially excavated features have artifact densities based on the percentages of the features excavated.

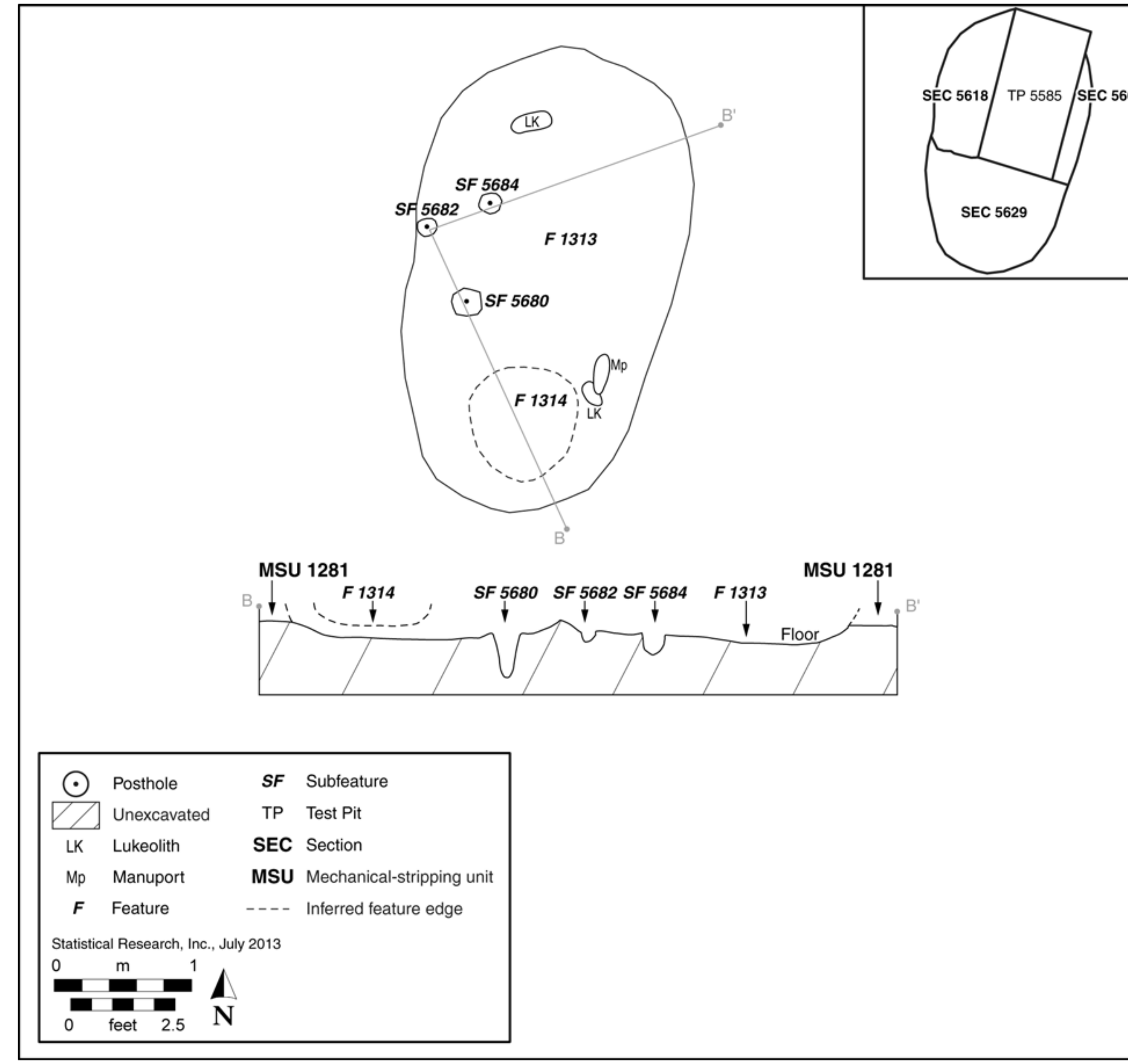

Figure 24. Post-excavation plan view and cross section of Features 1313 (a structure) and 1314 (an intrusive pit) at Falcon Landing.

Construction Details

Walls and Roof

Feature 1313 was built either in or around a 0.11-m-deep ovate pit. Whether the structure was in or surrounding the pit was impossible to interpret, because a single possible wall posthole (Subfeature 5682) was identified, located just below the western pit wall. Two other postholes (Subfeatures 5680 and 5684) were located near the center of the structure (Figure 25; see Figure 24) and may have functioned in roof support. The postholes were all circular in plan view and conical in cross section. The postholes ranged from 0.14 to 0.22 m in diameter (Table 11). Their depths ranged from 0.07 to 0.25 m, and the centrally located posts were deepest. One complete cobble uniface was recovered from Subfeature 5680. Pollen and macrobotanical samples were collected from Subfeature 5680 and were submitted for further analyses (see Chapters 6 and 7, Volume 2). Little else can be inferred about the construction of the structure's wall and roof, because no architectural debris was found in the structure fill.

Figure 25. Photograph of the floor of Feature 1313 at Falcon Landing, view to the south.

Table 11. Intramural Features in Feature 1313 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Posthole						
5680	circular	conical	0.22	0.22	0.25	0.0121
5682	circular	conical	0.14	0.14	0.07	0.0014
5684	circular	conical	0.16	0.16	0.11	0.0028

Floor

The floor of the structure consisted of the natural substrate. It was slightly compacted from use, and a thin lens of caliche had naturally developed upon it. Two complete Lukeoliths (for a definition of “Lukeoliths,” see Chapter 3, Volume 2) (PDs 5666 and 5668) and one stone manuport (PD 5667) were located on the floor, near the pit walls (Table 12; see Figure 24).

Entry

No entry was identified.

Interior Features

None.

Evidence of Remodeling

No evidence of remodeling was observed.

Table 12. Point-Located Floor Artifacts in Feature 1313 at Falcon Landing

PD No.	Stratum	Artifact Class	Artifact Type	Count
5666	floor	lithic	metate	1
5667	floor	lithic	expedient use	1
5668	floor	lithic	metate	1

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 1313 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Early to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The structure was likely abandoned with intent to return and was not burned. De facto refuse within the structure suggests that the structure was not cleaned at the time of abandonment; rather, it was meant to be reoccupied. Very little charcoal, no oxidation, and no burned architectural debris were observed. Further, the sediments within postholes, which were darker and more organic in color and texture, suggest that the postholes may have been left in place following its abandonment. Feature 1313 was likely infilled by natural processes.

Stratigraphic Relationships and Associated Features
Feature 1313 originated at the surface of Unit I, corresponding to the Early to Late Archaic period (see Appendix A). Feature 1314, a nonthermal pit, intrudes into the southern portion of Feature 1313 (see Figure 24) and therefore postdates the structure.

Ten other extramural features were within a 10-m radius of Feature 1313 and in the same stratigraphic unit. The nearest was an activity area, Feature 1337, about 5 m to the northeast. A house-in-pit (Feature 1498) radiocarbon dated to 1880–1690 cal. B.C. was located 10 m to the northeast. The other extramural features were Features 1305, 1306, 1307, 1308, 1312, 1338, 1378, and 1535. This assemblage of features may share a common temporal and behavioral component associated with household and communal use.

Chiricahua Phase Component

Feature 2602

Structure type: house-in-pit
Age: Chiricahua phase
Locus: Area A
Grid location: I5
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m^2): 32.34
Effective floor area (m^2): 25.90
Orientation: northeast
Length (m): 6.61
Width (m): 6.45
Excavated depth (m): 0.55
Volume (m^3): 20.780

Excavation Methods
Feature 2602 is one of the more complicated features on the Luke Solar project. It was originally interpreted as a large house-in-pit structure dating to the Middle Archaic period (see Table 10); however, conflicting

stratigraphic evidence is presented below and suggests that Feature 2602 was not as large as originally excavated and more accurately represents either an occupational surface dating to the Middle Archaic period or a structure surrounded by an activity area. Feature 2602 was located in the central portion of Falcon Landing, in Area A. It was originally identified during Phase 1, in the profile of TR 2216 (Figure 26), and was later uncovered by MSU 4630 during Phase 2 (see Appendix A). The plan-view shape of Feature 2602 was not definitively identified during excavations of MSU 4630; however, the profile of TR 2216 was used to define the eastern and western boundaries of the feature (see Figure 26). A 1-by-2-m control unit (TP 7561) was placed near the approximate center of Feature 2602, along the southern edge of TR 2216. TP 7561 was excavated in five arbitrary 10-cm levels. The bottom of Level 5 encountered a compact surface identified as the floor of the structure, as well as a large FAR-filled pit, which was later defined as Subfeature 7757. Once the floor of the structure was defined in TP 7561, the remainder of Feature 2602 was excavated in two sections. The portion of Feature 2602 north of TR 2216 was excavated as SEC 7568, and the portion of Feature 2602 south of TR 2216 was excavated as SEC 7571 (Figure 27). SECs 7568 and 7571 were both excavated in two arbitrary levels. Level 1 of the sections included all the fill of the structure, terminating at a level approximately 10 cm above the floor of the structure. Level 2 in both sections corresponded to the floor fill, or the 10 cm of fill above the floor. Once the floor was uncovered in both sections, numerous subfeatures were identified and excavated, including 45 postholes and 14 intramural pits (Figure 28). Some of the postholes (Subfeatures 7902, 7904, 7906, 7908, 7910, 7912, 7916, and 7918) and an intramural pit

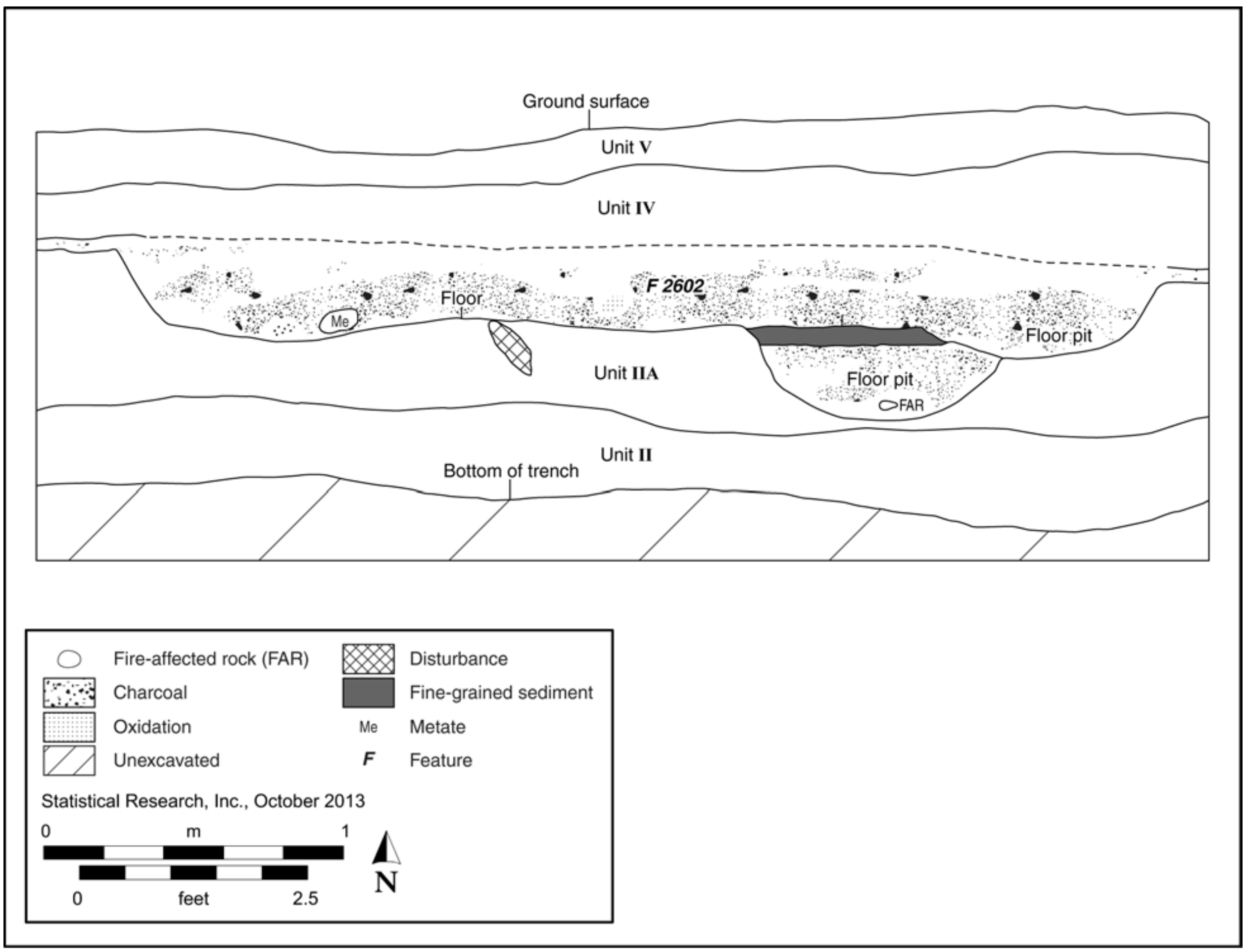

Figure 26. Profile of Feature 2602 (a possible structure) in the northern face of TR 2216, at Falcon Landing.

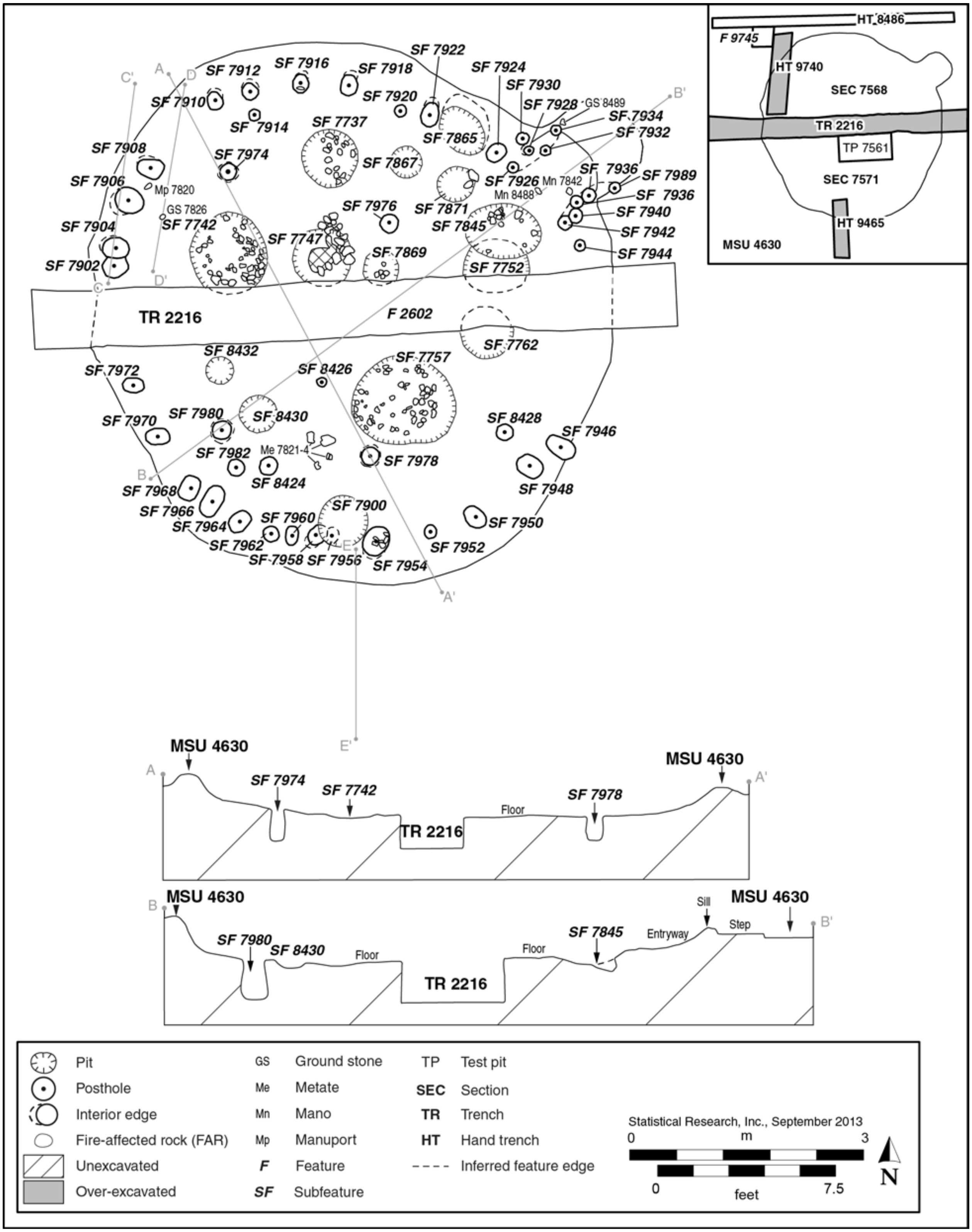

Figure 27. Post-excavation plan view and cross sections (Profiles A and B) of Feature 2602 (a possible structure) at Falcon Landing (Note: Profiles C–E are shown in Figure 29.)

Figure 28. Photograph of the floor of Feature 2602 prior to the excavation of subfeatures, view to the east.

(Subfeature 7865) associated with Feature 2602 were observed to be excavated into an underlying charcoal lens. This charcoal lens appeared to extend beyond the northern wall of Feature 2602.

Following the completion of excavations for Feature 2602, HTs 8486, 9465 and 9740 were excavated through the walls of Feature 2602 (Figure 29; see Figure 27 inset). These HTs were excavated in order to examine the charcoal lens that was observed in the profile of the northern wall of Feature 2602. HT 8486 was excavated east–west, immediately north of the northern wall of Feature 2602; HT 9465 was excavated through the southern wall of Feature 2602; and HT 9740 was excavated through the northwestern corner of Feature 2602. The profiles of these three HTs revealed that the charcoal lens identified in the floor fill of Feature 2602 continued beyond the walls to the north and south of the feature (see Figure 29).

During Phase 2 site closure, the area north of Features 2602 and 2605 was mechanically stripped to expose the underlying charcoal lens. This mechanical excavation uncovered 14 extramural nonthermal pits (Features 18465, 18466, 18467, 18468, 18469, 18471, 18472, 18473, 18475, 18476, 18477, 18478, 18479, and 18480) and 2 thermal pits (Feature 18470 and 18474). The 16 pits were located below the assumed wall of Feature 2602, or stratigraphically coeval (Unit II surface) with the floor of Feature 2602 (see Appendix A). A charred saltbush (*Atriplex* sp.) twig was collected from Feature 18468 and submitted to Aeon for AMS dating. The charcoal produced a 2σ date of 2860–2500 cal. B.C., dating it slightly older than the expected dates for Feature 2602.

Feature Fill

Three individual layers of deposition were present within Feature 2602, showing occupational use and various phases of abandonment and infilling (see Figure 26). The top layer is interpreted as postoccupational infilling of natural sediments, most likely from alluvial and aeolian processes, and consists of a yellowish brown sandy loam. Below that was a layer that appeared to be structural or cultural debris, consisting of a yellowish brown silty loam with a mix of ashy and charcoal-laden deposits. The basal layer was much darker and had a gray hue; it contained much more ash, charcoal, and oxidized sediment, which are interpreted as the

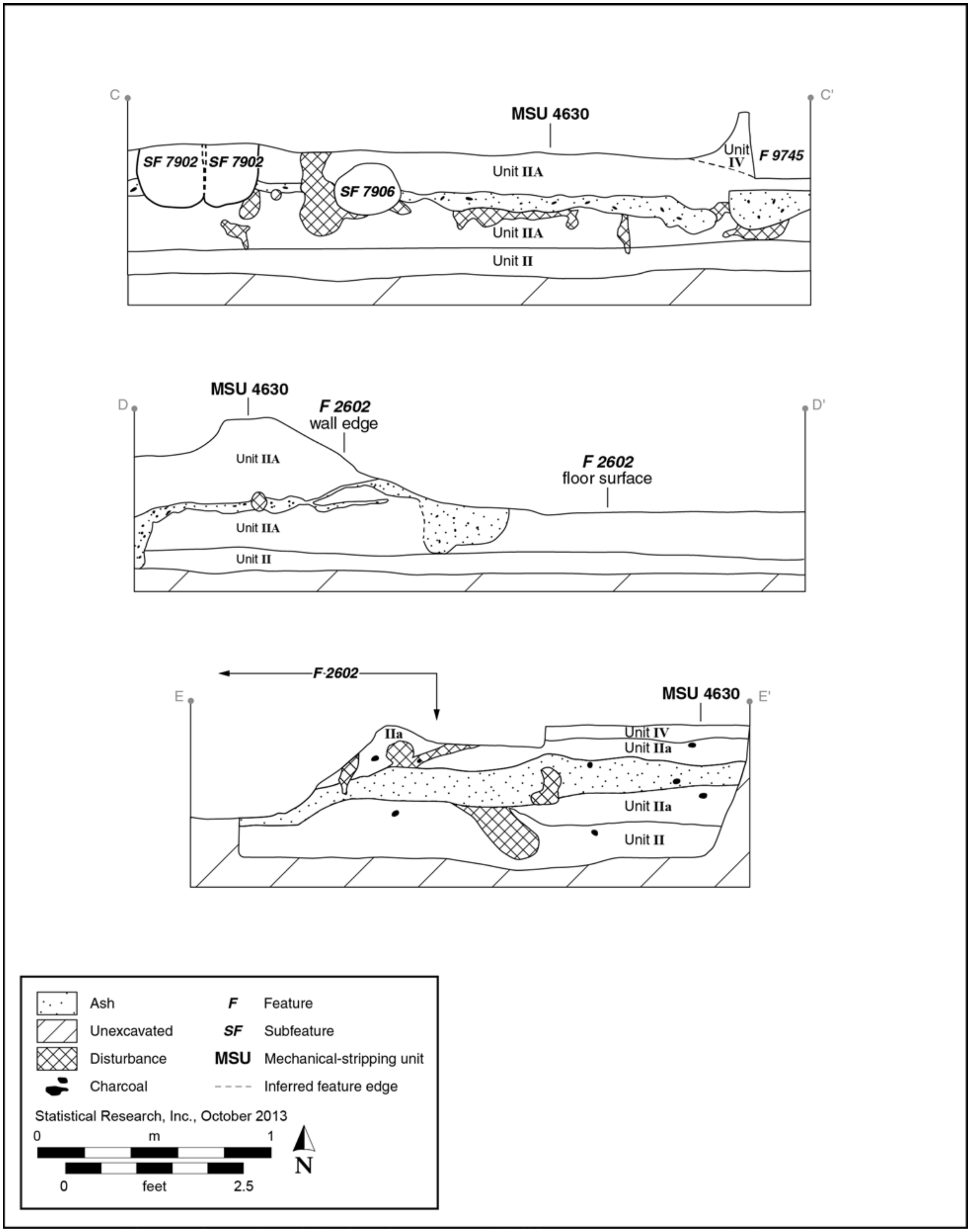

Figure 29. Profiles of HTs 9465 and 9740, excavated through Feature 2602 (a possible structure), upon the completion of excavation. (*Note:* The locations of Profiles C–E are indicated in Figure 26.) Profiles C and D show the western and eastern faces of HT 9740, respectively, and Profile E shows the western face of HT 9465.

in situ deposits dating from the final use of the structure. This basal layer was observed to continue beyond the northern wall of Feature 2602 and was further examined by hand trenching and mechanical stripping (see the Excavation Methods section, above) as well as HSUs (see the Stratigraphic Relationships and Associated Features section, below). Artifacts recovered from the fill of Feature 2602 included 72 indeterminate ground stone fragments, 30 mano fragments, 28 metate fragments, 24 pieces of FAR, 21 pieces of flaked stone debitage, 18 pieces of faunal bone, 8 manuports, 4 cores, 1 hammerstone, 3 pieces of freshwater-snail shell, and 1 piece of daub with a shell impression. One of the metate fragments was point-located in the feature fill in the profile of TR 2216 (see Figure 26).

Construction Details

Walls and Roof

In total, 45 postholes were identified and excavated in Feature 2602 (Table 13). Twenty eight of the postholes formed a circular shape approximately 7 m in diameter and had been placed just below the pit wall. These were interpreted as wall postholes (see Figure 27). The postholes were relatively evenly mixed between circular and ovate in plan view; 14 were ovate, 29 were circular, 1 was irregularly shaped, and another was rectangular or subrectangular. The distances between posts were quite varied, ranging from as much as 10–50 cm; it is unlikely that any were missed or have been eroded out, judging from the well-preserved nature of the remainder of the structure. The postholes ranged in diameter from 10 to 47 cm and were placed to depths ranging between 5 and 65 cm (see Figure 27). Nine intramural postholes were located in the floor of the structure (see Figure 27). Four of these posts (Subfeatures 7974, 7976, 7980, and 8428) may have been main support posts for the roof in a four-post, central pattern. Three posts (Subfeatures 7982, 8424, 7978, and 8428) are situated in a west–east line at the southern end of the structure, and it is possible that these may indicate the presence of some form of internal partition. Any or all of the intramural postholes could have also been associated with aboveground subfeatures. Eight postholes also lined the walls of the possible protruding entryway (see Figure 27). The postholes associated with the northern wall of Feature 2602 were observed to intrude into the charcoal lens (described above), and therefore their interpretation as postholes is suspect.

Floor

The floor of the possible structure consisted of an unprepared surface of yellowish brown silty clay loam that had been cut into the natural sediments. Some minor ash staining was noticed on the floor. Ten artifacts were in contact with the floor and were point-located (Table 14; see Figure 27).

Entry

A possible northeast-facing entryway was found during excavation, consisting of a protruding entry, slightly bulbous in shape, with a slightly domed wall juncture represented by a pair of postholes set slightly within the pit structure (see Figure 27). The fill was a slightly hard yellowish brown sandy loam mottled with ash and contained flecks of charcoal, similar to the fill from the remainder of the structure. The identification of a radiometrically contemporaneous pit (Feature 18468) located immediately below the possible entry sheds doubt on the interpretation of this entryway.

Interior Features

In addition to the floor surface and possible entryway, 14 intramural pits were excavated within the possible structure (see Figure 27); 8 of these were thermal pits, 5 were nonthermal pits, and 1 was a nonthermal bell-shaped pit (see Table 13). Six of the thermal pits produced significant quantities of FAR, mostly parts of ground stone artifacts. All but 1 of the thermal pits were oxidized to some extent, and the other pit was characterized as a thermal pit by the presence of FAR left in the center of the feature, presumably from its final use. The oxidization of thermal pits was mostly in small, localized patches that probably resulted from heated stones’ pressing on the sides of the pits rather than from direct, in situ burning.

Table 13. Intramural Features in Feature 2602 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
7867	circular	basin	0.38	0.38	0.40	0.0578
7871	ovate	basin	0.46	0.31	0.80	0.1141
7900	circular	basin	0.64	0.62	0.04	0.0159
8430	circular	basin	0.45	0.44	0.09	0.0178
8432	circular	basin	0.32	0.32	0.12	0.0123
Nonthermal pit (bell shaped)						
7865	circular	bell	0.67	0.62	0.49	0.2035
Posthole						
7902	ovate	conical	0.35	0.25	0.54	0.0472
7904	circular	irregular	0.36	0.30	0.550	0.0594
7906	ovate	irregular	0.47	0.35	0.54	0.0888
7908	circular	conical	0.36	0.29	0.65	0.0679
7910	ovate	irregular	0.29	0.23	0.61	0.0407
7912	rectangular or subrectangular	conical	0.25	0.25	0.46	0.0288
7914	circular	conical	0.15	0.15	0.14	0.0032
7916	circular	cylindrical	0.23	0.22	0.29	0.0147
7918	ovate	irregular	0.30	0.22	0.33	0.0218
7920	circular	conical	0.15	0.14	0.10	0.0021
7922	ovate	irregular	0.35	0.24	0.30	0.0252
7924	circular	irregular	0.30	0.24	0.35	0.0252
7926	circular	conical	0.11	0.11	0.17	0.0021
7928	circular	conical	0.18	0.14	0.25	0.0063
7930	circular	conical	0.17	0.17	0.10	0.0029
7932	circular	cylindrical	0.13	0.12	0.15	0.0023
7934	circular	conical	0.13	0.12	0.14	0.0022
7936	circular	cylindrical	0.18	0.18	0.26	0.0084
7938	circular	conical	0.20	0.16	0.16	0.0051
7940	ovate	cylindrical	0.22	0.16	0.28	0.0099
7942	circular	conical	0.18	0.17	0.27	0.0083
7944	circular	irregular	0.19	0.18	0.22	0.0075
7946	ovate	irregular	0.37	0.25	0.23	0.0213
7948	ovate	irregular	0.36	0.26	0.32	0.0300
7950	ovate	conical	0.32	0.24	0.32	0.0246
7952	circular	conical	0.17	0.14	0.15	0.0036
7954	circular	conical	0.42	0.32	0.31	0.0417
7956	irregular	irregular	0.22	0.10	0.21	0.0046
7958	ovate	irregular	0.30	0.23	0.30	0.0207
7960	ovate	conical	0.24	0.17	0.05	0.0020
7962	circular	conical	0.24	0.23	0.08	0.0044
7964	ovate	conical	0.33	0.23	0.12	0.0091
7966	ovate	conical	0.42	0.24	0.12	0.0121
7968	ovate	conical	0.34	0.23	0.14	0.0109
7970	circular	irregular	0.32	0.25	0.32	0.0256
7972	circular	cylindrical	0.26	0.20	0.37	0.0192
7974	circular	cylindrical	0.22	0.21	0.39	0.0180
7976	circular	cylindrical	0.23	0.23	0.33	0.0175
7978	circular	cylindrical	0.23	0.23	0.38	0.0201
7980	circular	cylindrical	0.23	0.22	0.36	0.0182
7982	circular	cylindrical	0.21	0.21	0.26	0.0115

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
7984	circular	conical	0.15	0.13	0.13	0.0025
8424	circular	irregular	0.20	0.20	0.20	0.0080
8426	circular	conical	0.12	0.11	0.09	0.0012
8428	circular	conical	0.20	0.20	0.25	0.0100
Thermal pit						
7737	circular	basin	0.75	0.75	0.12	0.0675
7742	circular	basin	0.93	0.90	0.08	0.0670
7747	circular	basin	0.71	0.69	0.08	0.0392
7752	indeterminate	basin	0.87	indeterminate	0.20	indeterminate
7757	circular	basin	1.27	1.10	0.55	0.7739
7762	indeterminate	basin	0.68	indeterminate	0.10	indeterminate
7845	ovate	basin	0.87	0.55	0.23	0.1101
7869	indeterminate	basin	0.40	indeterminate	0.70	indeterminate

Table 14. Point-Located Floor Artifacts in Feature 2602 at Falcon Landing

PD No.	Stratum	Artifact Class	Artifact Type	Count
7820	floor	lithic	expedient use	1
7821	floor	lithic	metate	2
7822	floor	lithic	metate	1
7823	floor	lithic	metate	1
7824	floor	lithic	metate	1
7826	floor	lithic	ground/battered stone	1
7842	floor	lithic	mano	1
8488	floor	lithic	mano	1
8489	floor	lithic	ground/battered stone	1

Subfeature 7737 was a thermal pit located in the north of the structure; it was filled with a dark grayish brown silty loam with rare fine-sand inclusions. The lining of the pit was oxidized in small localized patches, but no charcoal or ash was seen in the matrix. Five pieces of FAR were recovered from the pit, along with two mano fragments, two metate fragments, two indeterminate ground stone fragments, and a hammerstone.

Subfeature 7742 was a thermal pit toward the west-central portion of Feature 2602; it was filled with a mixed dark grayish brown and very dark gray silty loam matrix with rare fine-sand inclusions and charcoal flecks throughout. Small, localized oxidized patches were seen on the lining of the pit. Subfeature 7742 was truncated slightly on its southern side by TR 2216. Artifacts recovered from Subfeature 7742 include 18 mano fragments, 17 indeterminate ground stone fragments, 11 metate fragments, 6 pieces of FAR, and a hammerstone.

Subfeature 7747 was a thermal pit located toward the center of the feature; it was filled with a dark grayish brown silty loam with rare fine-sand inclusions but no evidence of burned material in the fill. A patch of the pit lining on the eastern side, approximately 25 cm in diameter, was slightly oxidized. Subfeature 7747 was truncated slightly on its southern side by TR 2216. Artifacts recovered from Subfeature 7747 include 8 mano fragments, 3 metate fragments, 3 pieces of FAR, 1 piece of faunal bone, and 1 indeterminate ground stone fragment.

Subfeature 7752 was a thermal pit in the east-central part of the structure. It was filled with mixed light and dark yellow/brown silty loam with very rare fine-sand inclusions. Subfeature 7752 was truncated to the south by TR 2216 and to the north by a later intramural feature (Subfeature 7845). Subfeature 7752 had a well-oxidized lining but no charcoal or FAR. Four pieces of faunal bone were also present in the fill of Subfeature 7752.

Subfeature 7757 was a thermal pit filled with a mixture of brown and very dark gray silty loam and rare patches of silt. Subfeature 7757 was situated just southeast of the center of the structure. The lining of this pit was oxidized in small patches. Ash and charcoal were present throughout the fill. Artifacts recovered from Subfeature 7757 include 41 metate fragments, 37 indeterminate ground stone fragments, 28 mano fragments, 21 pieces of FAR, 2 cores, and 2 hammerstones.

Subfeature 7762 was a thermal pit situated toward the eastern side of the structure. It was filled with a dark yellow/brown silty loam with very rare fine-sand inclusions but no evidence of burned material in the matrix. The pit lining was slightly oxidized. The northern half of this subfeature was removed by TR 2216. Artifacts recovered from Subfeature 7762 include three pieces of faunal bone and one piece of flaked stone debitage.

Subfeature 7845 was a thermal pit in the northeastern part of the structure; it was situated immediately inside the possible entryway. Subfeature 7845 truncated the northern part of Subfeature 7752. Subfeature 7845 was filled with a dark yellow/brown silty loam with very rare fine-sand inclusions; no charcoal or ash was observed in the fill. The pit lining was oxidized. Artifacts recovered from Subfeature 7845 include 10 indeterminate ground stone fragments, 9 metate fragments, and 4 mano fragments.

Subfeature 7865 was a nonthermal bell-shaped pit filled with a grayish brown sandy loam with very rare fine-gravel inclusions. The fill also included charcoal and ash. The bell-shaped pit was situated at the far-northeastern edge of the structure, where the base of the pit cut beneath the wall line. Artifacts recovered from Subfeature 7865 include 8 mano fragments, 4 metate fragments, 2 indeterminate ground stone fragments, and 1 manuport.

Subfeature 7867 was a very shallow nonthermal pit filled with a brown sandy loam with no inclusions other than rare charcoal flecks; it was situated near Subfeature 7865, in the northeastern part of the structure. No artifacts were recovered from the fill. The inferred function of this feature is that it served as a basket rest.

Subfeature 7869 was a thermal pit located in the central part of the structure, near Subfeature 7747, and the very southern end was truncated by TR 2216. The feature was filled with a dark grayish brown sandy loam with charcoal and ash. Six fragments of FAR were present in the center of the pit, but they were not collected.

Subfeature 7871 was a shallow nonthermal pit filled with a yellowish brown silty loam with very rare fine-sand inclusions, but no charcoal flecks or ash staining was present. This feature was situated in the northeastern quadrant of the structure, just inside the possible entryway. One mano fragment and one metate fragment were recovered from the fill.

Subfeature 7900 was located at the very southern edge of the structure and was truncated by two postholes (Subfeatures 7956 and 7958). Subfeature 7900 was a very shallow nonthermal pit filled with a dark yellow/brown silty loam with very rare fine-sand inclusions; there was no evidence of burned material in the fill. No artifacts were present in the fill of the pit.

Subfeature 8430 was a shallow nonthermal pit filled with a yellowish brown silty loam with very rare fine-sand inclusions; no charcoal flecks or ash staining was present. This feature was situated in the southwestern quadrant of the structure. No artifacts were recovered from the fill.

Subfeature 8432 was a nonthermal pit located in the southwestern quadrant of the structure, near Subfeature 8430. It was a very shallow pit filled with a brown sandy loam with rare charcoal flecks. No artifacts were recovered from the fill.

Evidence of Remodeling

Only two elements in this possible structure show that it may have been in use over a period of time longer than a single season. Subfeature 7845 was intrusive to Subfeature 7752, in the northeastern portion of Feature 2602, and Subfeature 7900, which was intruded by two postholes (Subfeatures 7956 and 7958), in the southern portion of Feature 2602.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 2602 was located at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying the structure (see Figure 26). The unconformity between the Unit IIA surface and Unit IV provides a geochronologic date of ca. 2420 cal. B.C.–cal A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

During Phase 1, a flotation sample was collected from the profile of Feature 2602 in TR 2216. From this flotation sample, a charred saltbush (*Atriplex* sp.) twig was submitted to Aeon for AMS analysis. The charcoal produced a 2σ date of 2560–2460 cal. B.C. (Aeon Sample No. 737), placing it in the Chiricahua phase of the Middle Archaic period (see Chapter 2, Volume 2). Following the Phase 2 excavation of Feature 2602, a charred horse-purslane (*Trianthema* sp.) seed was collected from Subfeature 7757 and submitted to Aeon for AMS analysis. The charcoal produced a 2σ date of cal. A.D. 1210–1270 (Aeon Sample No. 1436), placing it in the Classic period of the Hohokam chronology. Finally, a charred piece of saltbush (*Atriplex* sp.) wood was collected from Subfeature 7742 and submitted to Aeon for AMS analysis. The charcoal produced a 2σ date of 2830–2470 cal. B.C. (Aeon Sample No. 1539), placing it in the Chiricahua phase of the Middle Archaic period.

The results of the three radiocarbon dates for Feature 2602 are inconsistent. The cal. A.D. 1210–1270 date from Subfeature 7757 is over 3,500 years younger than the other two dates obtained from this structure. It is likely that the A.D. 1210–1270 date is the result of material that was intrusive into Subfeature 7757, possibly from a root burn or rodent disturbance. As a result, Feature 2602 is believed to date to the Chiricahua phase, consistent with the remaining two dates as well as the geochronologic dating.

Abandonment Processes

The evidence presented for the interpretation of Feature 2602 as a large Chiricahua phase structure is conflicting. Although the observation of Feature 2602 in the profile of TR 2216 and the overall excavation methods were sound, the final size and shape of Feature 2602 are called into question by stratigraphic evidence. The accumulated evidence presented here suggests that a Chiricahua phase structure may have been present in this location; however, the exact boundaries of this structure are not well defined. Furthermore, the charcoal lens uncovered in the HTs and HSUs surrounding Feature 2602 indicates that a cultural deposit overlies a larger extramural Chiricahua phase surface associated with numerous extramural pits (see Figure 29). It is likely that many or all of the intramural pits associated with Feature 2602 are parts of a larger Chiricahua phase occupation. For example, the numerous postholes located in the floor of Feature 2602 may represent an extramural feature, such as a small ramada or windbreak. Furthermore, some of the large subfeatures (i.e., Subfeatures 7737, 7742, 7747, and 7757) are uncharacteristic for intramural pits, and the presence of these large thermal pits within an enclosed structure further complicates this tenuous interpretation. Accepted radiocarbon dates for Feature 2602 (including Subfeature 7742) are similar to a radiocarbon date obtained from an extramural pit (Feature 18468) identified beneath the inferred entryway of Feature 2602. Similarly, a radiocarbon date from an extramural thermal pit (Feature 7998) located at the same stratigraphic position as the floor of Feature 2602 produced a similar age to the accepted date for Feature 2602 (see the Stratigraphic Relationships and Associated Features section, below). This evidence indicates the presence of a similar, shared extramural surface dating to the Chiricahua phase. The aboriginal use of this surface may be the origin of the charcoal lens, with cultural material accumulating over time through repeated or intensive use. Stratigraphically, this corresponds to the Unit IIA surface, a stable landform during the Middle Archaic period (see Chapter 2, Volume 2). The presence or absence of a Chiricahua phase structure associated with Feature 2602 should not diminish the importance of the vicinity of this feature as an area of Falcon Landing that was intensively used during the Middle Archaic period.

The abandonment of Feature 2602 is intimately tied to the overall interpretation of the feature and the surrounding area. The information gathered during the excavation of Feature 2602, as well as from the surrounding area, indicates that an intensively used Chiricahua phase occupation was preserved here at the Unit IIA surface. While this aboriginal surface was available for occupation, numerous domestic activities occurred (e.g., construction and use of extramural pits), and the area was ultimately abandoned. This scenario is consistent with the construction and use of structures (i.e., architecture) that have been documented in other areas of Falcon Landing. Over time, the Unit IIA surface was covered by late Holocene sheet-flood-event (i.e., Unit IV) deposits (see Chapter 2, Volume 2). Possible evidence of this sheet-flood event can be seen in the profile of Feature 2602 (see Figure 26), where fine-grained sediments were deposited over one of the subfeature pits associated with Feature 2602.

Stratigraphic Relationships and Associated Features

Upon completion of the Feature 2602 excavation, it was observed that the northern wall of the possible structure contained a lens of charcoal-laden fill, suggesting that the wall either was cut into cultural fill or was not a true wall (see Figure 29). In order to investigate this phenomenon, two adjacent HSUs (HSUs 7697 and 8435) were excavated immediately north of Feature 2602 (see Appendix A). HSUs 7697 and 8435 were both excavated down to the charcoal lens, exposing a combined area of approximately 9 by 3 m. Once the charcoal lens was uncovered, numerous extramural pits were identified at the same stratigraphic level as the assumed floor of Feature 2602. These features include five nonthermal pits (Features 4646, 4647, 8422, 8494, and 9451), three thermal pits (Features 7998, 8423, and 8497), and four FAR concentrations (Features 8449, 7986, 9475, and 9745) (see Appendix A). A charred seed from an unknown plant was collected from Feature 7998 and submitted to Aeon for AMS dating. The charcoal produced a 2σ date of 2570–2460 cal. B.C., identical to the accepted date for Feature 2602 (see the Radiocarbon Analysis section, above).

Numerous other extramural-pit features were identified at stratigraphic positions similar to that of the assumed floor of Feature 2602. For example, HSUs 7594 and 7604 were excavated along the northern and southern sides of TR 2216, located about 10 m to the east of Feature 2602 (see Appendix A). These HSUs uncovered three nonthermal pits (Features 2606, 7620, and 7621), three thermal pits (Features 7618, 7619, and 7622), and a charcoal/ash lens (Feature 7623). These features are stratigraphically coeval with the features identified during mechanical excavations along the northern end of Features 2602 and 2605 and dated to the Chiricahua phase.

Only 2 m to the east of this possible structure was another possible pit structure (Feature 2605), and it is likely that the two features are contemporaneous (see Appendix A). Numerous other extramural-pit features are stratigraphically similar to Feature 2602, existing at the Unit II or IIA surface (these features are listed above).

Feature 2605

Structure type: house-in-pit
Age: Chiricahua phase
Locus: Area A
Grid location: I5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 16.96
Effective floor area (m^2): 14.77
Orientation: indeterminate
Length (m): 5.10
Width (m): 3.90
Excavated depth (m): 0.52
Volume (m^3): 9.860

Excavation Methods

Feature 2605 was a possible house-in-pit structure dating to the Chiricahua phase (see Table 10). This possible structure was identified in profile in both faces of TR 2216, which bisected the feature east–west (Figure 30). The profile of Feature 2605 contained charcoal, ash, flaked stone, FAR, ground stone, and oxidized sediments. The feature was later uncovered in plan view during mechanical excavation (MSU 4630) (see Appendix A). Along the northern-wall profile of TR 2216, a 1-by-2-m control unit (TP 7581) was first hand-excavated within Feature 2605. The remaining structure fill was manually removed in two sections (SECs 7597 and 7662) (see Figure 30).

Excavation of all units ended with the exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. TP 7581 was excavated in four levels. Levels 1–3 were terminated arbitrarily at approximately 0.1 m in depth. Level 4 ended at the structure floor. SEC 7597 was excavated in three levels. Levels 1 and 2 were terminated arbitrarily at 0.1 m in depth, and Level 3 ended at the floor. A small portion of the eastern edge underwent over-excavation. The southern portion of this section was truncated during mechanical excavation; so, it was not as deep as TP 7581. SEC 7662 was excavated in two stratigraphic levels, defined below. The southern edge of this section was also slightly over-excavated.

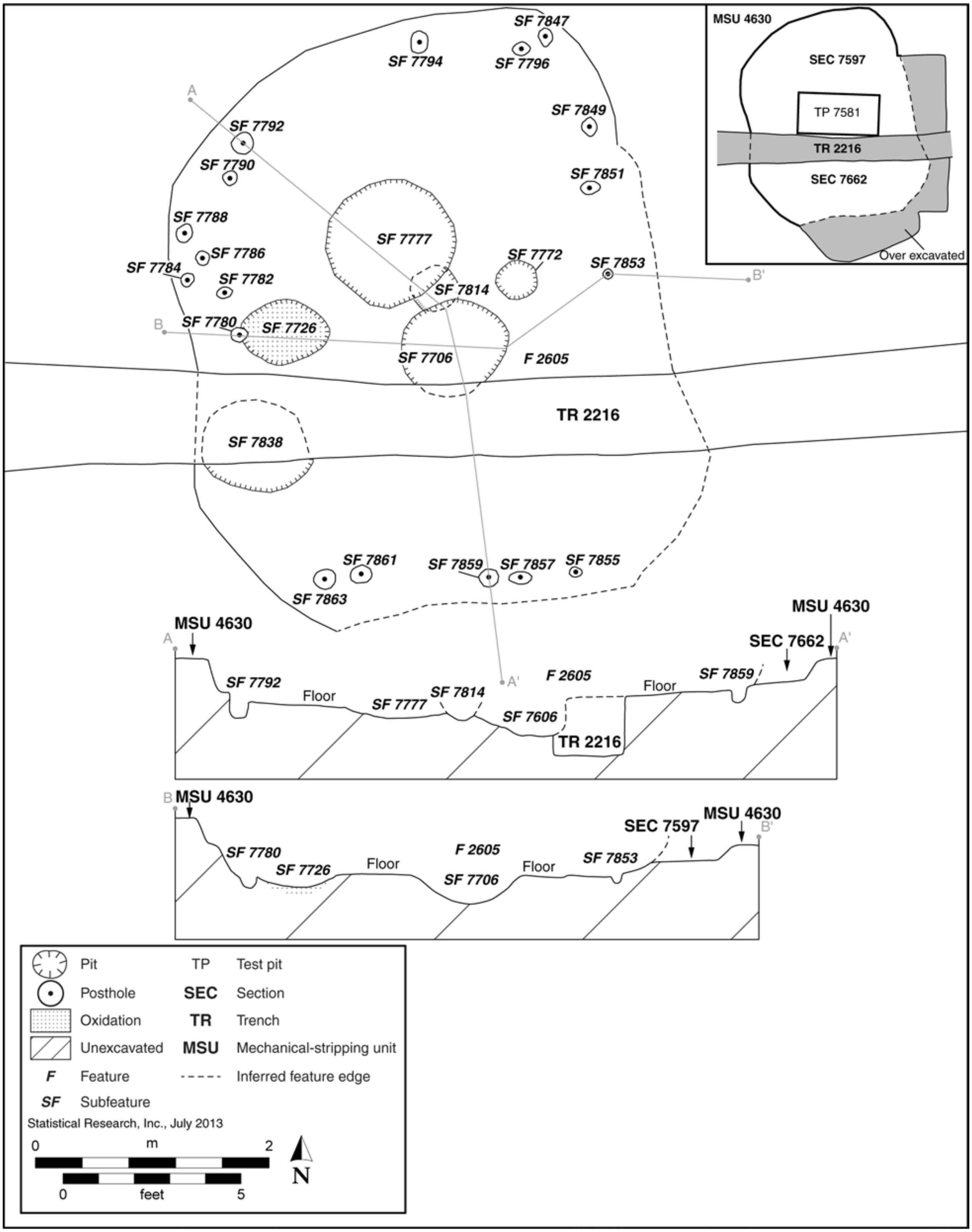

Figure 30. Post-excavation plan view and cross sections of Feature 2605 (a structure) at Falcon Landing.

During Phase 2 site closure, the area north of Features 2602 and 2605 was mechanically stripped to expose a charcoal lens identified during the excavation of Feature 2602 (see the Feature 2602 description, above). This mechanical excavation uncovered 14 extramural nonthermal pits (Features 18465, 18466, 18467, 18468, 18469, 18471, 18472, 18473, 18475, 18476, 18477, 18478, 18479, and 18480) and 2 thermal pits (Features 18470 and 18474), existing below the assumed wall of Feature 2602 and stratigraphically coeval (Unit II surface) with the floor of Features 2602 and 2605 (see Appendix A). A charred saltbush (*Atriplex* sp.) twig was collected from Feature 18468 and submitted to Aeon for AMS dating. The charcoal produced a 2σ date of 2860–2500 cal. B.C., dating it slightly older than the expected dates for Feature 2605.

Feature Fill

Two strata were identified in Feature 2605. Both were brown sandy silt. The appearance of charcoal pieces marked the transition to the lower stratum, which represented the fill directly above and in contact with the floor. In total, 49 artifacts were recovered from the structure fill (see Table 10). Artifact density decreased slightly toward the floor and included 3 pieces of faunal bone, 13 pieces of FAR, 1 cobble manuport, 2 pieces of flaked stone debitage, 1 complete multidirectional core, 1 edge-modified flake, 1 hammerstone fragment, 16 fragments of indeterminate ground stone, 7 mano fragments, 3 metate fragments, and 1 complete cobble mano. During Phase 1, a macrobotanical sample obtained from the trench profile was submitted for species identification (see Chapter 6, Volume 2).

Construction Details

Walls and Roof

Feature 2605 was a possible structure built in a 0.52-m-deep pit (Figure 31). The 18 wall postholes may have supported wooden poles, brush, or grasses. Most wall postholes were located within the pit wall, but a few were at the base wall (see Figure 30). Two postholes were ovate, 10 were circular, 3 were irregularly shaped, 2 were square or nearly square, and 1 was rectangular or subrectangular. All were cylindrical in cross section

Figure 31. Photograph of the floor of Feature 2605 at Falcon Landing, view to the south.

(Table 15). No internal support posts were evident, indicating that the roof may have been braced solely by the wall posts and possibly by horizontal crossbeams.

Floor

The floor of the possible structure consisted of the natural substrate, which displayed noticeable use compaction. No artifacts, oxidation, or ash staining was present on the floor.

Entry

No entryway was discernible.

Interior Features

Six pits originated within the floor of Feature 2605 (see Figure 30). One (Subfeature 7726) was classified as a thermal pit, and five were described as nonthermal pits (see Table 15).

Subfeature 7706 was a fairly deep nonthermal pit, was basin shaped in cross section, and was located near the center of the structure. Because of the superimposition of Subfeature 7706, by which Subfeature 7814 is minimally truncated, it is inferred that Subfeature 7706 was dug later in the life history of the structure. The

Table 15. Intramural Features in Feature 2605 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
7706	indeterminate	basin	0.76	indeterminate	0.21	indeterminate
7772	circular	basin	0.37	0.36	0.10	0.0133
7777	circular	basin	1.13	1.10	0.14	0.1740
7814	irregular	basin	0.41	0.37	0.12	0.0182
7838	indeterminate	basin	0.82	indeterminate	0.31	indeterminate
Posthole						
7780	circular	cylindrical	0.14	0.12	0.17	0.0029
7782	circular	cylindrical	0.15	0.14	0.14	0.0029
7784	square or nearly square	cylindrical	0.15	0.11	0.13	0.0021
7786	circular	cylindrical	0.16	0.14	0.25	0.0056
7788	ovate	cylindrical	0.18	0.13	0.18	0.0042
7790	circular	cylindrical	0.16	0.15	0.21	0.0050
7792	circular	cylindrical	0.20	0.20	0.26	0.0104
7794	irregular	cylindrical	0.20	0.13	0.30	0.0078
7796	ovate	cylindrical	0.19	0.10	0.14	0.0027
7847	circular	cylindrical	0.18	0.15	0.22	0.0059
7849	rectangular or subrectangular	cylindrical	0.21	0.18	0.09	0.0034
7851	square or nearly square	cylindrical	0.18	0.13	0.13	0.0030
7853	circular	cylindrical	0.10	0.10	0.06	0.0006
7855	irregular	cylindrical	0.12	0.10	0.15	0.0018
7857	irregular	cylindrical	0.20	0.11	0.15	0.0033
7859	circular	cylindrical	0.16	0.15	0.16	0.0038
7861	circular	cylindrical	0.20	0.17	0.19	0.0065
7863	circular	cylindrical	0.25	0.19	0.18	0.0086
Thermal pit						
7726	ovate	basin	0.67	0.47	0.12	0.0378

fill was a gray sandy loam with very fine-sand inclusions and some ash. A single cobble-mano fragment was recovered from the fill. The southern edge of the pit was partially removed by the excavation of TR 2216.

Subfeature 7726, was a thermal pit located in the western portion of the structure. The pit fill was a brown sandy loam with some fine-sand inclusions and numerous large pieces of charcoal. Showing that the pit had been subjected to extensive bioturbation along the walls and base, a 2-cm-thick basal oxidized rind remained partially intact. A single piece of indeterminate ground stone was recovered from the pit.

Subfeature 7772 was a small nonthermal pit located near the center of the structure. Basin shaped in cross section, it contained a gray sandy loam with very rare fine-sand inclusions, ash, and charcoal.

Subfeature 7777 was a large nonthermal pit, was basin shaped in cross section, and was located in the central and northern parts of the structure. This pit contained a brown sandy loam with rare fine-sand inclusions and numerous pieces of charcoal. Two pieces of unworked land-snail shell and three pieces of faunal bone were recovered. Subfeature 7777 intruded upon the northwestern half of Subfeature 7814, which lay to the southeast, suggesting that Subfeature 7777 was dug later in the life history of the structure.

Subfeature 7814, a small nonthermal pit that was basin shaped in cross section, was located near the center of the structure and contained two discreet strata. The pit was truncated minimally by Subfeatures 7706 and 7777. The uppermost stratum corresponded with the structure's final use and was a light yellowish gray sandy loam containing charcoal, ash, and small patches of oxidized soil. The lower stratum was a compact brown sandy loam containing numerous charcoal fragments. No evidence of in situ burning was noted, and this pit may have served as an area used to dispose soils from the cleanout of a thermal pit. Macrobotanical and pollen samples from the fill of this subfeature were submitted for analyses (see Chapters 6 and 7, Volume 2).

Subfeature 7838 was characterized as a nonthermal pit. This subfeature was located in the western portion of the structure, and its northern part was removed by the excavation of TR 2216. It contained a brown sandy loam with rare fine-sand inclusions. Two pieces of FAR and one indeterminate ground stone fragment were recovered from this feature, although no signs of in situ burning were observed.

Evidence of Remodeling

Subfeature 7814 was located in the central portion of Feature 2605. Two other pits (Subfeatures 7706 and 7777) intruded upon Subfeature 7814, indicating at least one episode of reuse within the structure.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 2605 was located at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit IIA surface and Unit IV provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

During Phase 1, a piece of burned mesquite (*Prosopis* sp.) wood from the fill of Feature 2605 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 2560–2460 cal. B.C. (Aeon Sample No. 738). The date corresponds to the Chiricahua phase of the Middle Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

Abundant charcoal in the lower stratum suggests that the possible structure may have burned at the time of abandonment, or sometime thereafter, and was then infilled by natural processes. The lower stratum contained a significant amount of large (up-to-0.02-m) charcoal fragments that may represent architectural debris resulting from a final burning event or could be remnants of transferred burned material from other occupational activities at the site. No oxidation was present on the floor. Fine aeolian and alluvial deposits indicate that the uppermost stratum was deposited naturally. Additionally, soil-color differentiations in certain subfeatures suggest that some pits may have been cleaned out prior to abandonment and that others retained sediments from their last uses (e.g., Subfeature 7706, 7772, and 7814).

Stratigraphic Relationships and Associated Features

Feature 2605 originated at the surface of Unit IIA. Both the date range of this horizon and the radiocarbon date corresponded to the Chiricahua phase. No features lay directly over or under Feature 2605. To the west of Feature 2605 was a possible structure, Feature 2602, that originated in the same stratigraphic position. This feature was alternatively interpreted as an aboriginal surface with numerous pits. It was radiocarbon dated to the Chiricahua phase and appears to be contemporaneous with Feature 2605.

Numerous extramural features were located within a 10-m radius of Feature 2605 and had similar stratigraphic positions (Unit IIA). These features include 11 nonthermal pits (Features 4639, 4640, 7883, 7884, 7885, 8414, 8422, 8494, 9451, 9484, and 9500), 5 thermal pits (Features 7685, 7998, 8423, 8497, and 8499), a charcoal/ash lens (Feature 7878), and an FAR concentration (Feature 7986).

Several other extramural-pit features were identified at stratigraphic positions similar to that of the assumed floor of Feature 2605. For example, HSUs 7594 and 7604 were excavated along the northern and southern sides of TR 2216, located about 6 m to the east of Feature 2605 (see Appendix A). These HSUs uncovered three nonthermal pits (Features 2606, 7620, and 7621), three thermal pits (Features 7618, 7619, and 7622), and a charcoal/ash lens (Feature 7623). These features are stratigraphically coeval with the features identified during mechanical excavations along the northern end of Features 2602 and 2605, as well as the floor of Feature 2605, which all correspond to the Chiricahua phase.

Feature 2622

Structure type: possible structure
Age: Chiricahua phase
Locus: Area A
Grid location: J3
Level of effort: sampled
Plan-view shape: indeterminate
Cross-sectional shape: irregular
Total floor area (m^2): indeterminate
Effective floor area (m^2): indeterminate
Orientation: indeterminate
Length (m): 2.90
Width (m): indeterminate
Excavated depth (m): 0.17
Volume (m^3): indeterminate

Excavation Methods

Feature 2622 was a possible structure of indeterminate shape and construction that produced a date within the Chiricahua phase (see Table 10). Discovered during Phase 1 in the profile of TR 2219, Feature 2622 consisted of an irregularly shaped pit containing charcoal, ash, and oxidized sediments (see Appendix A). It originated about 0.4 m below the modern ground surface (Figure 32). The feature was not relocated during Phase 2 mechanical stripping (MSU 4580). During Phase 1, a flotation sample was collected from the profile of Feature 2622. A macrobotanical sample was recovered from this flotation sample and submitted for species identification (see Chapter 6, Volume 2).

Feature Fill

This possible structure contained a single stratum that consisted of a moderately compact ashy gray-brown fill with occasional flecks of charcoal and pockets of ash (see Figure 32). No architectural debris was present. A lens of silt was observed in the western portion of the structure, directly above the uppermost structure fill, and probably represents postabandonment alluvial or aeolian processes. One piece of FAR, three unworked faunal bones, and one freshwater-snail-shell fragment were collected from the structure fill.

Construction Details

Walls and Roof

Feature 2622 was built either in or around a pit that was at least 0.17 m in depth. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition,

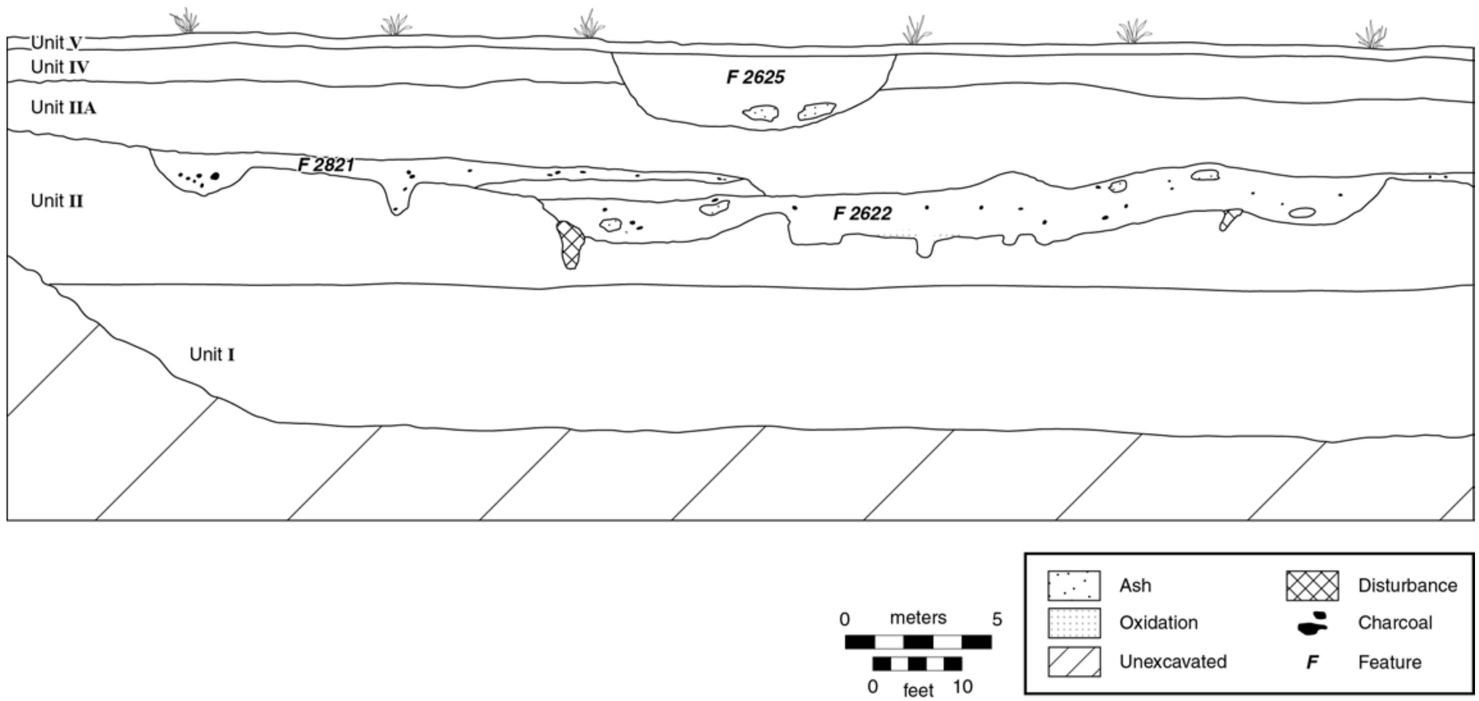

Figure 32. Profiles of Features 2622 and 2821 (possible structures) and Feature 2625 (an overlying pit), in the northern wall of TR 2219, at Falcon Landing.

because architectural debris was not present within the structure fill, little can be said about the structure walls (see Figure 32). The level of examination conducted in this structure precludes further inferences about the nature of its actual construction.

Floor

The inferred floor was observed only in the profile of TR 2219 as a somewhat use-compacted surface excavated into the natural substrate. A shallow subfloor depression located near the center of the structure may have been an intramural pit. This depression was not given a subfeature number, but it was noted to contain oxidized sediments (see Figure 32).

Entry

No entryway was discernible.

Interior Features

Two possible postholes were observed near the inferred center of the structure, along with a possible intramural pit that was basin shaped in cross section. These features remain speculative and were not assigned subfeature numbers, and reliable metrics were not obtained.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 2622 was located at the surface of Unit II, with the Unit IIA soil horizon overlying the structure. The unconformity between the surface of Unit II and Unit IIA provides a geochronologic date of ca. 2810–2730 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

During Phase 1, a piece of burned saltbush (*Atriplex* sp.) wood from the fill Feature 2622 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of ca. 2560–2460 cal. B.C. (Aeon Sample No. 741). This date corresponds to the Chiricahua phase of the Middle Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

No abandonment sequence could be established, because the feature was only observed in profile. However, the presence of a thin silt lens just below Feature 2821, a structure that superimposed Feature 2622 in the west, suggests that a short period of time elapsed before the area was used or reused. Feature 2622 may have been remodeled, and it could be that Feature 2821 was the result of a later construction and habitation phase.

Stratigraphic Relationships and Associated Features

Feature 2622 originated at or near the surface of Unit II, although the stratigraphic date is slightly older than the radiocarbon date for this feature. Both the geochronologic date and the radiocarbon results place the feature in the Chiricahua phase. The western edge of Feature 2622 was observed to underlie the eastern edge of Feature 2821, and the two features were vertically separated by a thin lens of alluvial or aeolian silt (see Figure 32). A possible structure, Feature 2623, was located about 2 m east of Feature 2622, in TR 2219. A nonthermal pit (Feature 2625) was located stratigraphically above Feature 2622 and was geochronologically dated to the Classic to Protohistoric period.

Most of the features around Feature 2622 originated at the surface of Unit IIA, underlying Unit IV (see Appendix A). This horizon dates to the Middle Archaic to Pioneer period, indicating that the features were potentially contemporaneous with Feature 2622. Just south of Feature 2622 was Feature 19503, a large ash lens overlying a thermal pit, Feature 10920. Five more pits in the same horizon were located to the north and northwest (Features 4602, 4604, 6838, 6841, and 6919). Located in Unit IIA and also dated to the Chiricahua phase were Features 10910, 10911, 10913, 10914, 10917, 10918, 10919, 10924, 16586, 16593, 18416, 18417, 18418, 18419, 18420, 18435, 18436, 18437, 18439, 18440, 18442, 18443, 18448, 18449, 18450, 18451, and 19534.

Feature 2623

Structure type: possible structure
Age: Chiricahua phase
Locus: Area A
Grid location: J3
Level of effort: examined
Plan-view shape: indeterminate
Cross-sectional shape: basin

Total floor area (m^2): indeterminate
Effective floor area (m^2): indeterminate
Orientation: indeterminate
Length (m): 1.85
Width (m): indeterminate
Excavated depth (m): 0.14
Volume (m^3): indeterminate

Excavation Methods

Feature 2623 was a possible structure of indeterminate construction dating to the Chiricahua phase (see Table 10). It was discovered during Phase 1 in the profile of TR 2219. Feature 2623 was originally identified as a large, basin-shaped pit that originated at the interface of Units II and IIA, approximately 0.5 m below the modern ground surface (Figure 33; see Appendix A). The feature was not relocated during Phase 2 mechanical stripping (MSU 4580).

Feature Fill

This possible structure, recorded only in profile, was filled with a single stratum, which consisted of a moderately compact gray-brown, ash-rich sandy loam with occasional flecks of charcoal, some FAR, and minimal but observable patches of oxidized sediment. The FAR was not collected. Charcoal and oxidized sediments were limited to the western half of the structure, near its base, as well as toward the upper portion of structure fill, in the east. The center of the structure was disturbed by a rodent-sized burrow. No artifacts were observed.

Construction Details

Walls and Roof

Feature 2623 was built either in or around a pit that was at least 0.14 m in depth. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not present within the structure fill, little can be said about the structure walls.

Floor

The inferred floor was observed only in the profile of TR 2219 as a somewhat use-compacted surface excavated into the natural substrate.

Entry

No entryway was discernible.

Interior Features

None were observed.

Evidence of Remodeling

No evidence of remodeling was observed.

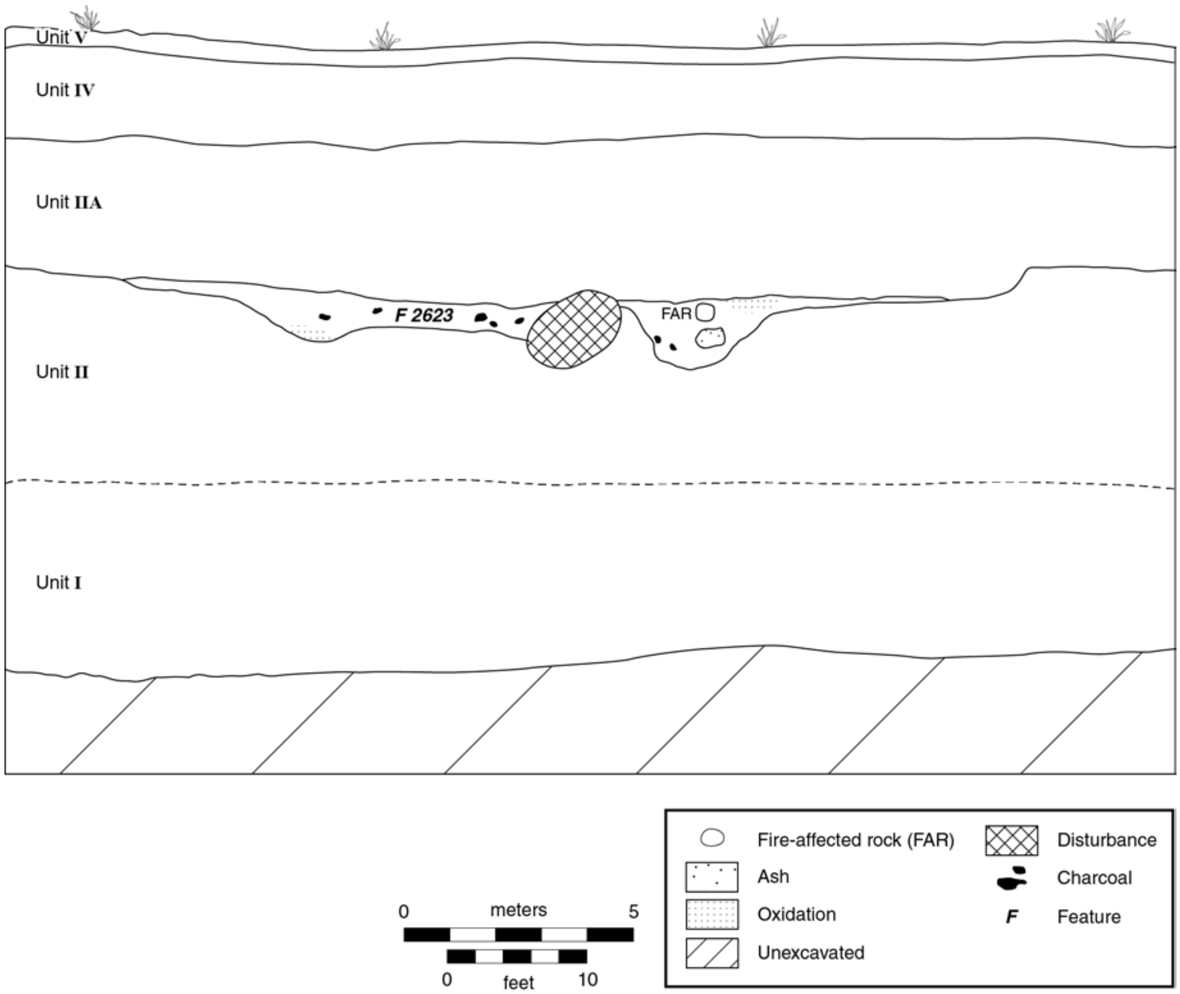

Figure 33. Profile of Feature 2623 (a possible structure), in the northern wall of TR 2219, at Falcon Landing.

Chronometric Data

<u>**Diagnostic Material Culture**</u>
None.

<u>**Geochronologic Analysis**</u>
Feature 2623 was located at the surface of Unit II, with Unit IIA overlying it. The unconformity between the Unit II surface and Unit IIA provides a geochronologic date of ca. 2810–2730 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

<u>**Radiocarbon Analysis**</u>
None.

Abandonment Processes
Because of the presence of ash, FAR, and charcoal in the fill it is possible the structure burned or was filled with trash after structure abandonment (see Figure 33). Little else can be inferred, because the structure was only examined in profile.

Stratigraphic Relationships and Associated Features

This structure originated at the surface of Unit II, below Unit IIA, and dated to the Chiricahua phase. A nearby structure (Feature 2622), was in the same stratigraphic position (see Appendix A). Many features in the area originated within Unit IIA, dating to the Chiricahua phase. Thirty-five such features were located within a 10-m radius of Feature 2623, including an activity area (Feature 18782) and numerous extramural pits. Located in Unit IIA, and also dated to the Chiricahua phase, were 21 nonthermal pits (Features 10911, 10913, 10914, 10917, 10918, 10919, 10924, 16586, 16593, 18417, 18418, 18419, 18420, 18435, 18436, 18437, 18443, 18448, 18449, 18450, and 18451), and 5 thermal pits (Features 10910, 18416, 18439, 18440, and 18442).

Feature 2821

Structure type: possible structure
Age: Chiricahua phase
Locus: Area A
Grid location: I4
Level of effort: sampled
Plan-view shape: indeterminate
Cross-sectional shape: basin

Total floor area (m^2): indeterminate
Effective floor area (m^2): indeterminate
Orientation: indeterminate
Length (m): 2.00
Width (m): indeterminate
Excavated depth (m): 0.08
Volume (m^3): indeterminate

Excavation Methods

Feature 2821 was a possible structure that dated to the Chiricahua phase (see Table 10). It was identified during Phase 1 in the profile of TR 2219 as a slightly basin-shaped stain extending approximately 2 m east–west (see Appendix A) (see Figure 32). A scaled hand-drawn profile map was created of Feature 2821, and a flotation sample was collected from the fill. Feature 2821 was not relocated during Phase 2 mechanical stripping (MSU 4580).

Feature Fill

This possible structure was filled with a single stratum, which consisted of a moderately compact ashy gray-brown soil with occasional charcoal flecks (see Figure 32). One piece of FAR and four unworked faunal bones were collected from the trench profile (see Table 10). A macrobotanical sample was also obtained and submitted for analysis (see Chapter 6, Volume 2).

Construction Details

Walls and Roof

Feature 2821 was built either in or around a pit that was roughly 0.08 m in depth. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not identified within the structure fill, little can be said about the structure walls.

Floor

The floor was observed only in the profile of TR 2219. It was an earthen, use-compacted surface consisting of the natural substrate. No artifacts were observed in contact with the structure floor.

Entry

No entryway was discernible.

Interior Features

None.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 2821 was located at the surface of Unit II, with a late Holocene silt loam soil horizon (Unit IIA) overlying it. The unconformity between the Unit II surface and Unit IIA provides a geochronologic date of ca. 2810–2730 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
Because of the presence of an ashy fill with many flecks of charcoal, it is possible that the structure was infilled with trash or that it was burned (see Figure 32). Another scenario involves deposition of this material into the structure by natural alluvial processes.

Stratigraphic Relationships and Associated Features
The geochronologic date range of Feature 2821 corresponds to the Chiricahua phase of the Middle Archaic period. Feature 2821 overlaid the western edge of Feature 2622, another structure that was radiocarbon dated to the Chiricahua phase (see Appendix A). The two features were separated by a thin lens of alluvial or aeolian silt, suggesting that Feature 2622 may have been abandoned and that Feature 2821 was a later construction. Feature 2821 has a slightly older geochronologic date, however, suggesting that the two possible structures were constructed and abandoned in a short period of time or were contemporaneous (see Figure 32).

Contemporaneous extramural pits in the vicinity include Features 10917 and 10918. Six other pits had date ranges that overlapped with that of Feature 2821: Features 4602, 4604, 6838, 6841, 6919, and 10920, dating to the Middle Archaic to Pioneer period.

Feature 4387
Structure type: house-in-pit
Age: Chiricahua phase
Locus: Area B
Grid location: D2
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m^2): 4.60
Effective floor area (m^2): 4.32
Orientation: indeterminate
Length (m): 2.80
Width (m): 2.60
Excavated depth (m): 0.35
Volume (m^3): 1.650

Excavation Methods
Feature 4387 was a possible house-in-pit that dated to the Chiricahua phase (see Table 10). It was discovered during mechanical excavation of MSU 4580 (see Appendix A). A 1-by-2-m control unit (TP 2885) was placed in the inferred center of the feature (Figure 34). TP 2885 was excavated in three arbitrary 10-cm levels, and Level 3 reached the floor surface. Once a portion of the floor surface had been identified in the test pit, the remaining pit structure was excavated in two additional sections. SEC 4429 consisted of approximately the northern three-quarters of the structure, and the southern portion of the structure was excavated as SEC 4434. Following feature excavation, a ring of postholes was identified well inside the excavated area. At that point in time, it was inferred that the structure pit had been over-excavated and that the structure was considerably smaller (see Figure 34).

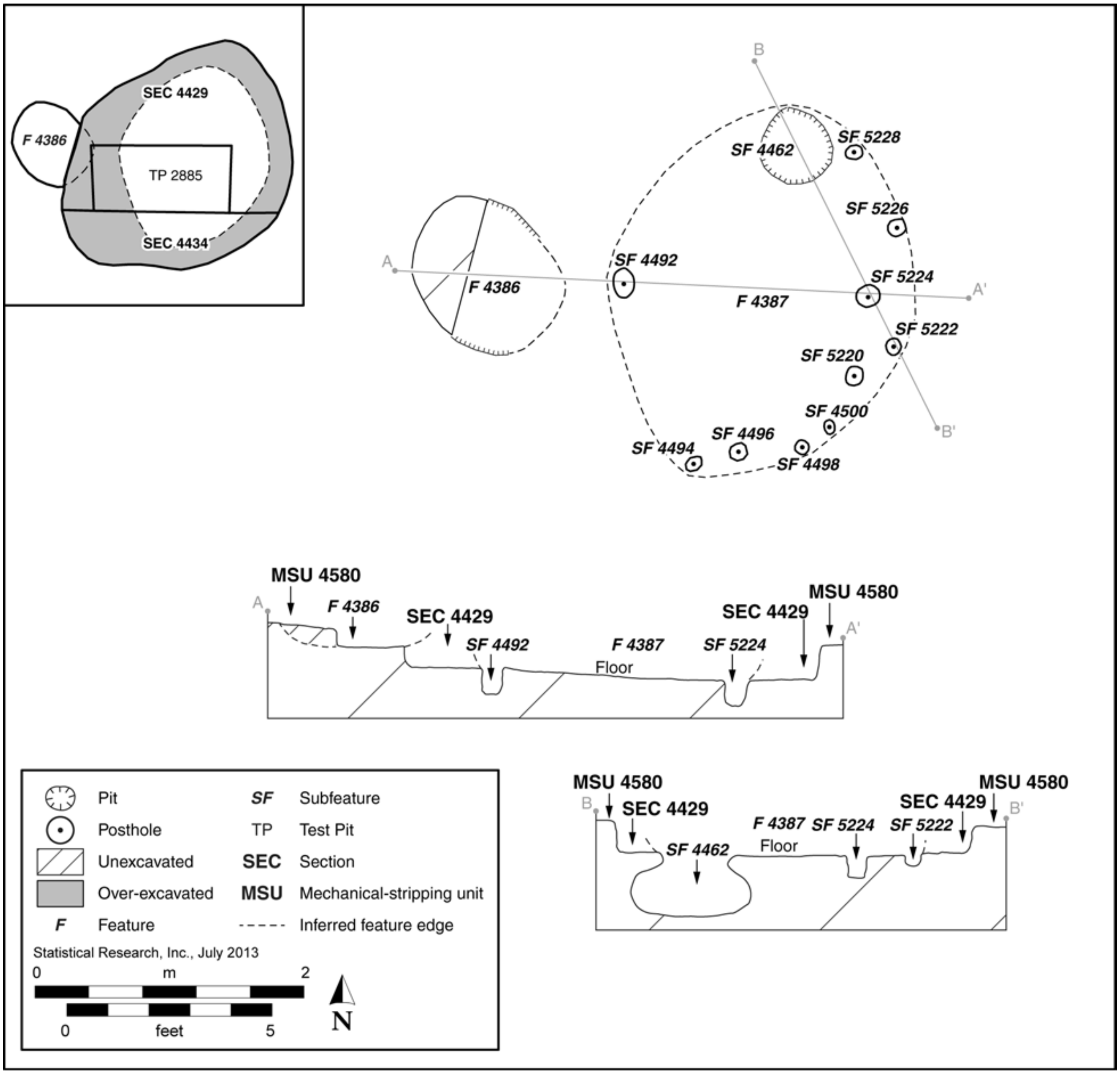

Figure 34. Post-excavation plan views and cross sections of Features 4387 (a structure) and 4386 (an adjacent pit) at Falcon Landing.

Feature Fill

The structure fill was composed of a yellowish brown silt loam containing large amounts of oxidized sediment, concentrations of burned wood, and some ash. Apart from the presence of these burned inclusions, the structure fill was generally indistinguishable from the natural substrate. Quantities of burned material decreased toward the floor. Artifacts included nine pieces of flaked stone debitage, one edge-modified flake, and one piece of unworked faunal bone (see Table 10). Pollen and macrobotanical samples from all three levels of the test pit were submitted for further analysis (see Chapters 6 and 7, Volume 2).

Construction Details

Walls and Roof

The structure was built within a 0.35-m-deep pit. The pit edges were not identified during excavation, but the structure was inferred to be circular in shape based on the arrangement of 10 wall postholes (Figure 35; Table 16; see Figure 34). The posthole fill was less compact than the substrate, and three postholes contained charcoal flecks.

Floor

The floor of the structure consisted of the unprepared substrate. No patches of oxidation or ash were present. Some insect bioturbation was noted. No artifacts were in contact with the floor.

Entry

No entryway was identified.

Interior Features

One nonthermal bell-shaped pit, Subfeature 4462, was identified within the structure floor (see Figure 34; Table 16). This feature was circular in plan view and bell shaped in cross section. It contained a single stratum of brown silt loam that was differentiated from the substrate by the presence of small charcoal flecks and the absence of caliche filaments. No artifacts were recovered from the pit, but pollen and macrobotanical samples were submitted for further analysis (see Chapters 6 and 7, Volume 2).

Evidence of Remodeling

No evidence of remodeling was observed.

Figure 35. Photograph of the floor of Feature 4387 and adjacent pit Feature 4386 at Falcon Landing, view to the north.

Table 16. Intramural Features in Feature 4387 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit (bell shaped)						
4462	circular	bell	0.55	0.50	0.53	0.1458
Posthole						
4492	circular	cylindrical	0.20	0.16	0.20	0.0064
4494	circular	cylindrical	0.12	0.10	0.14	0.0017
4496	circular	cylindrical	0.12	0.11	0.15	0.0020
4498	circular	cylindrical	0.10	0.09	0.14	0.0013
4500	circular	cylindrical	0.09	0.09	0.17	0.0014
5220	circular	cylindrical	0.11	0.10	0.14	0.0015
5222	circular	cylindrical	0.08	0.08	0.07	0.0004
5224	circular	cylindrical	0.17	0.13	0.18	0.0040
5226	circular	cylindrical	0.14	0.12	0.20	0.0034
5228	circular	cylindrical	0.14	0.12	0.18	0.0030

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 4387 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III1) overlying it. The unconformity between the Unit I surface and Unit III1 provides a geochronological date of ca. 5320–1380 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

Burned mesquite (*Prosopis* sp.) wood from Level 3 of the test pit was submitted to Aeon for AMS analysis and returned a 2σ calibrated date of 2900–2700 cal. B.C. (Aeon Sample No. 1443) (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

Abandonment Processes

The single intramural bell-shaped pit appears to have been infilled before deposition occurred in the main house pit. Charcoal and oxidized sediment were present in the upper fill, although no evidence of burning was observed on or near the floor. The postholes also contained less burned material than the upper fill. Perhaps the structure was initially filled naturally through wind-borne and water-lain sediments and that the superstructure burned later. Another possibility is that the structure collapsed and filled naturally and was then filled intentionally with refuse during the occupation of the site.

Stratigraphic Relationships and Associated Features

Feature 4387 was in a stratigraphic location that dated to the Early to Middle Archaic period; the radiocarbon date narrowed that to the Chiricahua phase. An intrusive pit, Feature 4386, was at the western end of the structure (see Figure 34). Another Chiricahua phase structure, Feature 4388, was located 5 m to the southwest (see Appendix A). A structure from the Middle to Late Archaic period (Feature 4349) was 10.5 m to the south.

Three features dating to the Early to Middle Archaic period were within 10 m of the structure: Features 4344, 4384, and 4385. Three other neighboring pits dated to the Middle to Late Archaic period: Features 4345, 4350, and 4397.

Feature 4388

Structure type: house-in-pit
Age: Chiricahua phase
Locus: Area B
Grid location: D2
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 4.16
Effective floor area (m^2): 3.71
Orientation: indeterminate
Length (m): 2.95
Width (m): 2.14
Excavated depth (m): 0.10
Volume (m^3): 0.630

Excavation Methods

Feature 4388 was a Chiricahua phase house-in-pit (see Table 10). The structure was discovered during mechanical excavation of MSU 4268 (see Appendix A) and was visible as a charcoal-stained area on the stripped surface. A 1-by-2-m control unit (TP 2892) was placed over the western edge of the feature (Figure 36) and was excavated in four arbitrary 10-cm levels. Levels 1–3 were excavated through feature fill, and Level 4 was excavated through floor fill. The structure floor was reached at the end of Level 4.

The remainder of the feature was hand-excavated in two sections (SECs 4439 and 4472). SEC 4439 was used to investigate the southeastern two-thirds of the structure, and SEC 4472 was used for the northern one-eighth of structure. Because of difficulty in defining the structure-pit edge, the upper level of each unit was partially over-excavated (see Figure 36). SECs 4439 and 4472 were excavated in three levels; Level 1 and 2 represented feature fill, and Level 3 represented floor fill. Level 1 was not screened.

Feature Fill

The feature fill was an unstratified brown, moderately compact silty clay loam with a low density of charcoal flecks. Minimal bioturbation from roots, rodents, and insects was noted. Artifacts included one projectile point fragment, one metate fragment, one cobble uniface, and two pieces of faunal bone (see Table 10). A macrobotanical sample from the upper house fill was sent for further analysis (see Chapter 6, Volume 2).

Construction Details

Walls and Roof

The structure was built within a 0.10-m-deep ovate pit. Fifteen wall postholes were found and excavated below the pit walls (Figure 37; Table 17). No postholes were found along the northeastern wall, possibly because of erosion (see Figure 36). The postholes were all circular in plan view and cylindrical in cross section. They ranged between 0.09 and 0.12 m in diameter and between 0.04 and 0.07 m in depth. None of the postholes contained any burned material.

Floor

The floor consisted of an unprepared earthen surface. It was more compact and lighter in color than the feature fill, and three intramural pits originated within it. Animal burrowing and insect and plant disturbance were also evident. No artifacts were in contact with the floor.

Entry

No entryway was noted during the excavations. It is possible that an entryway may have been located in the possibly eroded northeastern part of the structure.

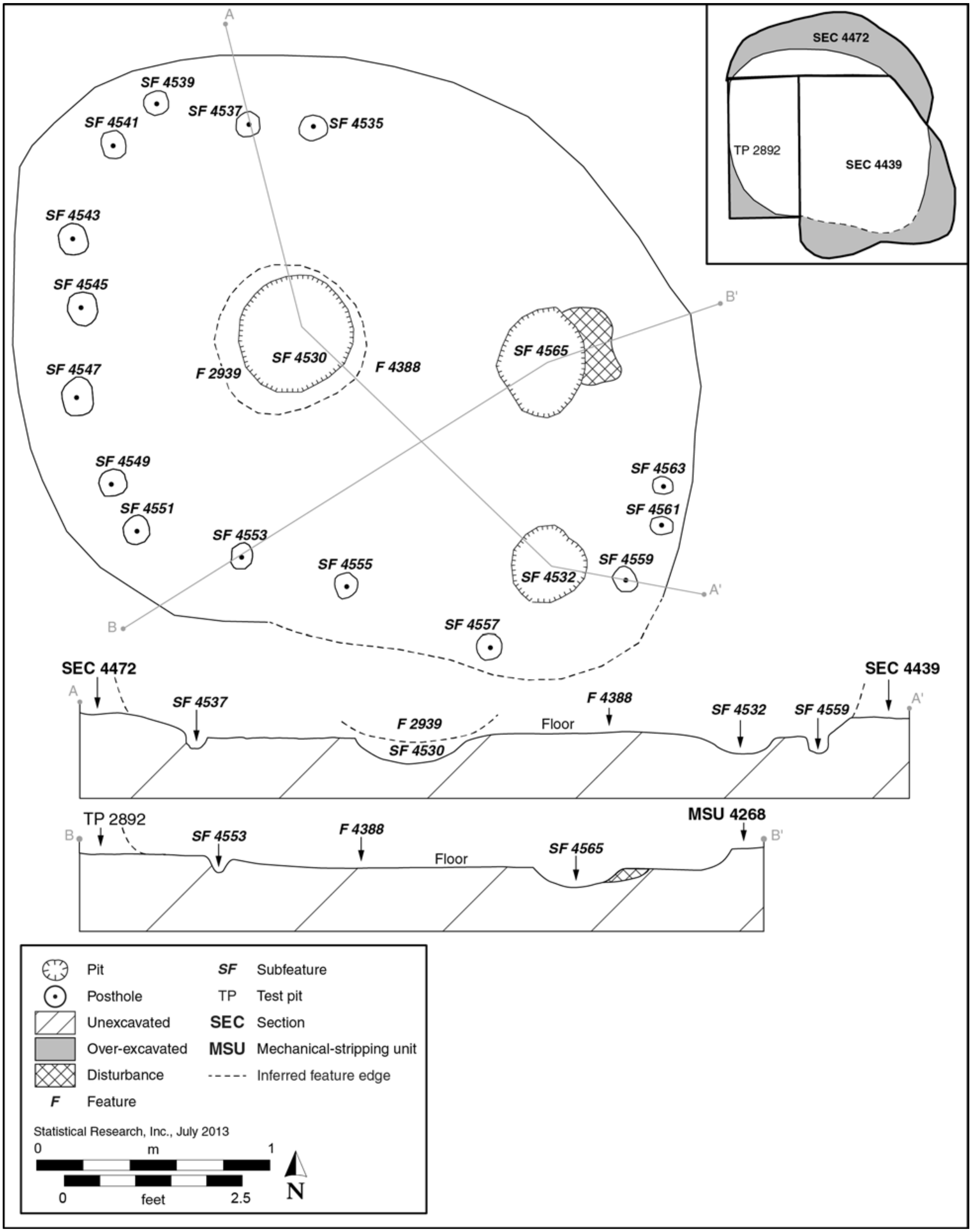

Figure 36. Post-excavation plan view and cross sections of Features 4388 (a structure) and 2939 (an intrusive pit) at Falcon Landing.

Figure 37. Photograph of the floor of Feature 4388 at Falcon Landing, view to the southeast.

Table 17. Intramural Features in Feature 4388 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
4530	circular	basin	0.48	0.48	0.09	0.0207
4532	circular	basin	0.35	0.30	0.04	0.0042
4565	circular	basin	0.40	0.37	0.06	0.0089
Posthole						
4535	circular	cylindrical	0.11	0.10	0.06	0.0007
4537	circular	cylindrical	0.10	0.10	0.05	0.0005
4539	circular	cylindrical	0.10	0.10	0.04	0.0004
4541	circular	cylindrical	0.12	0.12	0.06	0.0009
4543	circular	cylindrical	0.12	0.12	0.05	0.0007
4545	circular	cylindrical	0.12	0.12	0.06	0.0009
4547	circular	cylindrical	0.12	0.12	0.06	0.0009
4549	circular	cylindrical	0.12	0.12	0.06	0.0009
4551	circular	cylindrical	0.12	0.12	0.04	0.0006
4553	circular	cylindrical	0.10	0.10	0.04	0.0004
4555	circular	cylindrical	0.10	0.10	0.06	0.0006
4557	circular	cylindrical	0.10	0.10	0.07	0.0007
4559	circular	cylindrical	0.10	0.10	0.05	0.0005
4561	circular	cylindrical	0.09	0.09	0.04	0.0003
4563	circular	cylindrical	0.10	0.10	0.04	0.0004

Interior Features

Three intramural pits (Subfeatures 4530, 4532, and 4565) originated at the floor. All three were nonthermal, circular in plan view, shallow, and basin shaped in cross section, and none of the pits had a depth of greater than 0.10 m (see Figure 36; Table 17). All contained a brown silty clay loam with no charcoal or artifacts. Carbonate filaments and a small amount of sand and gravel were also present in the fill of each pit. A pollen sample recovered from the base of Subfeature 4565 was submitted for further analysis (see Chapter 7, Volume 2).

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

A projectile point was recovered from Level 3 of TP 2892, but it was a distal fragment and therefore was not assigned to a specific typology.

Geochronologic Analysis

Feature 4388 originated at or near the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III1) overlying it. The unconformity between the surface of Unit I and Unit III1 provides a geochronologic date of ca. 5320–1380 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A mesquite (*Prosopis* sp.) seed from Level 1 of the structure fill was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 3020–2890 cal. B.C. (Aeon Sample No. 747), corresponding to the Chiricahua phase of the Middle Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

Lack of charcoal staining and oxidation on the floor indicates that the structure did not burn upon abandonment. The sediment in the intramural pits had no charcoal, and a small amount was seen in the structure fill. The intramural pits may have been filled in an earlier episode of deposition. In both the structure and the subfeatures, the deposition seems to have resulted from natural alluvial processes.

Stratigraphic Relationships and Associated Features

The stratigraphic date range of Feature 4388 corresponds to the Early to Middle Archaic period. This was further narrowed to the Chiricahua phase by the radiocarbon date. Dispersed structures and extramural pits were located around Feature 4388 (see Appendix A). One feature was in contact with the structure. An intrusive nonthermal pit, Feature 2939, was excavated into the center of the structure (see Figure 36). The nearest structure was another Chiricahua phase house-in-pit, Feature 4387, located 5 m to the northwest. To the southeast was a Middle to Late Archaic period structure (Feature 4349) that was also potentially contemporaneous.

Most of the extramural pits within a 10-m radius were in the same stratigraphic unit as Feature 4388, dating to the Early to Middle Archaic period. These included Features 1552, 1553, 2939, 4344, 4350, 4351, 4354, 4384, 4385, and 4386. Two pits, Features 4345 and 4346, dated to the Middle to Late Archaic period.

Feature 14613

Structure type: house-in-pit
Age: Chiricahua phase
Locus: Area A
Grid location: J5
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m²): 6.26
Effective floor area (m²): 5.72
Orientation: indeterminate
Length (m): 3.48
Width (m): 3.40
Excavated depth (m): 0.16
Volume (m³): 1.420

Excavation Methods

Feature 14613 was a Chiricahua phase house-in-pit (see Table 10). The structure was identified during mechanical excavation of MSU 14574 (see Appendix A). Upon identification, it appeared as a large, circular, organic stain containing dispersed charcoal flecking, ash, and FAR. A 1-by-2-m control unit (TP 16892) was first hand-excavated near the center of the stain. The remaining structure fill was then manually removed in two sections (SECs 16938 and 16997) (Figure 38).

The control unit and sections ended upon the floor surface, which consisted of a slightly darker, relatively compact, continuous earthen surface. Because of shallow depth and lack of stratigraphy, the control unit and the sections were excavated in one level. Flotation samples were collected from TP 16892 and SEC 16938, and two pollen samples were collected from the floor surface.

Feature Fill

A single stratum was present within the fill of Feature 14613. It consisted of a brown silty loam containing a moderate amount of dispersed charcoal flecking, ash, and FAR, especially in the southern portion of the structure. The fill displayed laminated sediments consistent with aeolian and alluvial deposition. No architectural debris was present. Minimal rodent disturbance was noted throughout the fill. Four pieces of FCR and two indeterminate ground stone fragments were present in the structure fill (see Table 10). Charcoal obtained from the floor fill (TP 16892, Level 1) was submitted for further analysis (see Chapter 6, Volume 2).

Construction Details

Walls and Roof

Feature 14613 was built within a circular pit that measured 3.48 m in diameter and 0.16 m in depth. Ten postholes were identified in association with the structure walls (Figure 39; Table 18; see Figure 38). All of the wall postholes lined the inside the pit edge; however, 8 of them originated below the pit walls, and 2 of them (Subfeatures 13686 and 13688) originated within the pit walls (see Figure 38). The postholes measured between 0.13 and 0.30 m in diameter and 0.10–0.31 m in depth and were generally circular in plan view and cylindrical in cross section. Their fill was generally grayish brown and was softer, ashier, and sandier than the structure fill. Four of the postholes contained charcoal flecking, and 1 displayed oxidation on the edges. Because no architectural debris was identified in the structure fill, little else can be interpreted regarding the walls and roof of the structure.

Floor

The floor of the structure consisted of the natural substrate, which displayed noticeable use compaction. A concentration of charcoal, ash, and FAR was identified on the floor, adjacent to a thermal pit (see Subfeature 13678 description, below). No additional artifacts were found in contact with the floor. A pollen sample recovered from the floor was submitted for analysis (see Chapter 7, Volume 2).

Entry

No entryway was discernible.

Interior Features

A thermal pit (Subfeature 13678) originated at the structure floor, along the western edge of the structure (see Figure 38; Table 18). The walls and base were unprepared but heavily oxidized. The thermal pit was basin shaped in cross section and 0.24 m in depth. In plan view, it was circular and 0.67 m in diameter. Two strata were present in the fill of Subfeature 13678; however, the thermal pit was excavated in a single unit and level. The upper stratum was 0.20 m in depth, consisted of light brown silty loam, and was similar to the structure fill. It displayed laminated sediments consistent with aeolian and alluvial deposition and contained a moderate amount of dispersed charcoal, ash, and FAR. The lower stratum was 0.04 m in depth and was a lens of ash that was perhaps associated with the last use of the subfeature. One bulk flotation sample

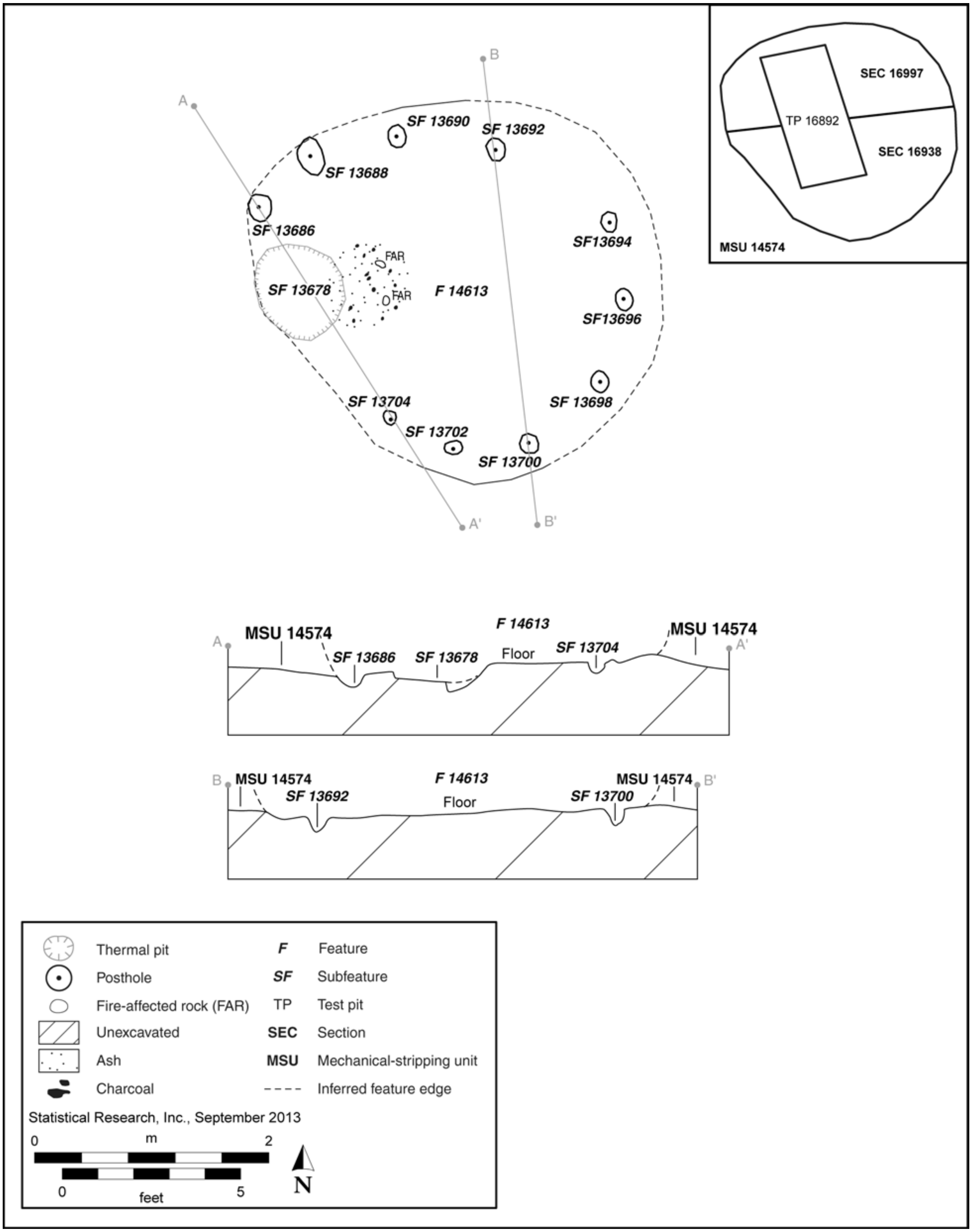

Figure 38. Post-excavation plan view and cross sections of Feature 14613 (a structure) at Falcon Landing.

Figure 39. Photograph of the floor of Feature 14613 at Falcon Landing, view to the north.

Table 18. Intramural Features in Feature 14613 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Thermal pit						
13678	circular	basin	0.67	0.65	0.24	0.1045
Posthole						
13686	circular	irregular	0.22	0.20	0.31	0.0136
13688	circular	conical	0.30	0.24	0.15	0.0108
13690	circular	cylindrical	0.20	0.20	0.12	0.0048
13692	circular	cylindrical	0.20	0.20	0.10	0.0040
13694	circular	cylindrical	0.15	0.14	0.12	0.0025
13696	circular	cylindrical	0.15	0.15	0.11	0.0025
13698	circular	cylindrical	0.15	0.15	0.13	0.0029
13700	circular	cylindrical	0.16	0.14	0.10	0.0022
13702	circular	cylindrical	0.14	0.13	0.10	0.0018
13704	circular	cylindrical	0.14	0.14	0.12	0.0024

was collected and may have included sediments from both strata; the remaining fill was screened through 1/4-inch mesh. Lastly, a pollen sample was scraped from the pit base. A single indeterminate ground stone fragment was the only artifact present within the feature.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 14613 originated at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit I surface and Unit IV provides a geochronologic date of ca. 5320 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis
A fragment of mesquite (*Prosopis* sp.) charcoal recovered from the floor fill (TP 16892, Level 1) was submitted to Aeon for AMS analysis and returned a 2σ calibrated date range of cal. A.D. 2840–2490 (Aeon Sample No. 1488) (see Chapter 2, Volume 2). This date range places the use of the structure in the Chiricahua phase of the Middle Archaic period.

Abandonment Processes
The structure fill possessed no evidence of structural debris, and the upper stratum within the thermal pit was filled with deposits similar to the structure fill, suggesting that the structure may have been dismantled upon abandonment. The relatively small amount of charcoal and the lack of architectural debris in the structure fill, as well as no oxidation or charcoal staining on the floor, indicates that the structure did not burn. It appears that after abandonment, the structure predominantly filled with natural wind-borne and water-lain deposits. Four pieces of FAR and two indeterminate ground stone fragments present in the structure fill may have been intentionally deposited during infilling of the pit structure.

Stratigraphic Relationships and Associated Features
The geochronologic date range for the structure corresponded to the Early Archaic to Pioneer period, and that was narrowed to the Chiricahua phase by the radiocarbon results. The closest feature was a more-recent FAR concentration on the modern ground surface, Feature 2006 (see Appendix A). It overlay the eastern edge of the structure and postdated the early Historical period. A few Chiricahua phase pits were within 10 m of the structure. Features 14603, 14604, and 14605 originated in Unit II and may have been contemporaneous with Feature 14613. The other nearby pits shared a stratigraphic position similar to that of Feature 14613 and may have been in use at the same time: Features 14613, 14622, 14838, 14839, 14840, 14841, 14842, 14843, and 14844.

Feature 14614
Structure type: house-in-pit
Age: Chiricahua phase
Locus: Area A
Grid location: I5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m²): 2.25
Effective floor area (m²): 2.24
Orientation: indeterminate
Length (m): 2.45
Width (m): 2.05
Excavated depth (m): 0.20
Volume (m³): 0.680

Excavation Methods

Feature 14614 was a possible house-in-pit that dated to the Chiricahua phase (see Table 10). The structure was identified during mechanical excavation of MSU 14596 (see Appendix A). It appeared as a large, ovate, organic stain containing dispersed charcoal flecking, ash, and oxidation. A 1-by-1-m control unit (TP 17862) was first hand-excavated near the center of the stain. The remainder of the structure fill was then manually removed in two sections (SECs 17887 and 17889) (Figure 40).

The control unit and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. Although two strata were present, the control unit and the sections were excavated in one arbitrary level because of the shallow depth of fill. Flotation samples were recovered from TP 17862 and SEC 17889, and a pollen sample was scraped from the structure floor.

Feature Fill

Two strata were present in the fill of Feature 14614. The uppermost was 0.17 m thick and consisted of a slightly hard yellowish brown sandy clay loam containing a sparse quantity of dispersed charcoal flecking. This stratum displayed laminated sediments consistent with aeolian and alluvial deposition. The lower stratum was a 0.03 m thick and consisted of a mottled yellowish brown silty clay loam containing abundant charcoal, ash, and oxidized-sediment nodules (daub). This stratum was in contact with the floor and was deepest within the northwestern portion of the structure. It appeared to primarily represent burned architectural debris. Seven pieces of unworked faunal bone and one piece of flaked stone debitage were recovered from the structure fill, but it is unclear with which stratum they were associated.

Construction Details

Walls and Roof

Feature 14614 was built either in or around a 0.20-m-deep ovate pit (Figure 41). Whether the structure was in or surrounding the pit was impossible to interpret, because only a single posthole (Subfeature 13970) was identified. Burned daub and abundant charcoal and ash in the structure fill appeared to be the remains of burned architectural debris and suggest that the structure was constructed of brush and daub. The single posthole originated at the floor of the structure, immediately below the northern structure wall (see Figure 40). The posthole was 0.20 m in diameter and 0.09 m in depth. The post may have been burned in place, because the fill of the posthole contained abundant charcoal and oxidized soil.

Floor

The floor of the structure consisted of the natural substrate, which displayed noticeable use compaction. Patches of ash, charcoal staining, and oxidation were present on the floor, particularly in the northwestern part of the structure. No artifacts were found in contact with the floor.

Entry

No entryway was discernible.

Interior Features

None.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

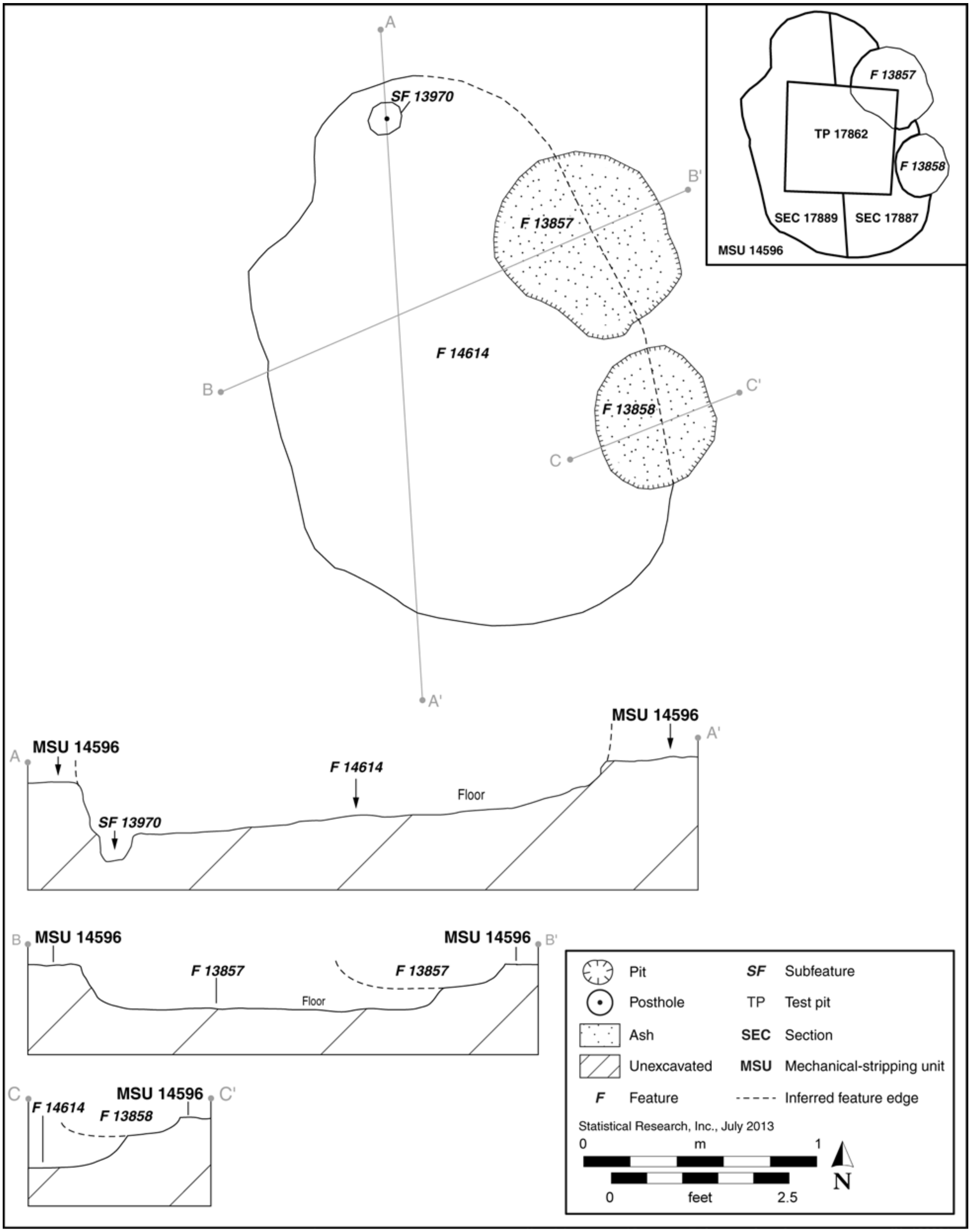

Figure 40. Post-excavation plan view and cross sections of Feature 14614 (a structure) and Features 13857 and 13858 (intrusive pits) at Falcon Landing.

Figure 41. Photograph of the floor of Feature 14614 at Falcon Landing, view to the north.

Geochronologic Analysis
Feature 14614 was located within Unit IIA. The bracketing age range for Unit IIA is ca. 2810–2420 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The lack of artifacts in contact with the structure floor suggests that the structure had a planned abandonment. The structure fill indicates that the structure burned, and then the remainder of the pit filled with wind-borne and water-lain deposits. The eight artifacts found within the structure fill could have been washed into the structure pit, brought in by animal disturbance, or deposited intentionally.

Stratigraphic Relationships and Associated Features
Feature 14614 originated within Unit IIA, the dates of which correspond to the Chiricahua phase. Associated features include two intrusive thermal pits, Features 13857 and 13858, on the eastern edge of the structure (see Figure 40). Few other extramural pits existed within 10 m of Feature 14614, but all shared the same stratigraphic position (see Appendix A): Features 7623, 13857, 13858, 14595, 14609, 14610, 14612 14615, 14616, 14625, 14626, and 14628.

Feature 15113

Structure type: house-in-pit
Age: Chiricahua phase
Locus: Area B
Grid location: F4
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: indeterminate

Total floor area (m^2): 3.01
Effective floor area (m^2): 2.69
Orientation: indeterminate
Length (m): 2.20
Width (m): 2.10
Excavated depth (m): 0.14
Volume (m^3): 0.450

Excavation Methods

Feature 15113 was a possible house-in-pit that dated to the Chiricahua phase (see Table 10). The feature was identified during mechanical excavation of MSU 15070 (see Appendix A). It appeared as a large, irregularly shaped, organic stain containing charcoal flecking. To define the shape of the feature, HSU 20469, measuring 2 by 2 m, was excavated over the stain to a depth of 0.04–0.14 m. During excavation of HSU 20469, a surface and an associated thermal pit were identified (Figure 42). Evidence of a shallow structure-pit wall was also identified. HSU 20469 was only grab-sampled, but a flotation sample was recovered from the structure floor. Other than excavation of the thermal pit, no additional excavations took place within Feature 15113.

Feature Fill

The sediments associated with the fill of the structure were a yellowish brown sandy clay loam containing sparse charcoal flecking. These sediments were considered to be natural alluvial and aeolian deposits. No artifacts were recovered.

Construction Details

Walls and Roof

Because only a small portion of the structure-pit wall was identified, it was impossible to determine the exact size and shape of Feature 15113. The preserved portion of Feature 15113 indicated that the structure was circular in plan view and possibly basin shaped in cross section. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not present, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The floor of the structure consisted of the natural substrate. It did, however, display noticeable use compaction. No artifacts were found in contact with the floor.

Entry

No entryway was discernible.

Interior Features

A thermal pit (Subfeature 20476) was the only subfeature in association with the structure floor (see Figure 42). The thermal pit was basin shaped in cross section and circular in plan view and measured 0.68 by 0.60 m and 0.14 m in depth (Figure 43). The thermal pit was excavated in one stratigraphic unit and level. A flotation sample was collected, and the remaining fill was screened through 1/4-inch mesh. A pollen sample was scraped from the pit base. The pit fill was a soft yellowish brown sandy loam containing sparse charcoal and oxidized sediment. It displayed evidence of fine wind-borne and water-lain deposits. The southeastern portion of the thermal pit was significantly oxidized. Artifacts were not present. The lack of abundant ash and charcoal and the presence of wind-borne and water-lain deposits suggest that the pit was cleaned out after its last use and then infilled naturally.

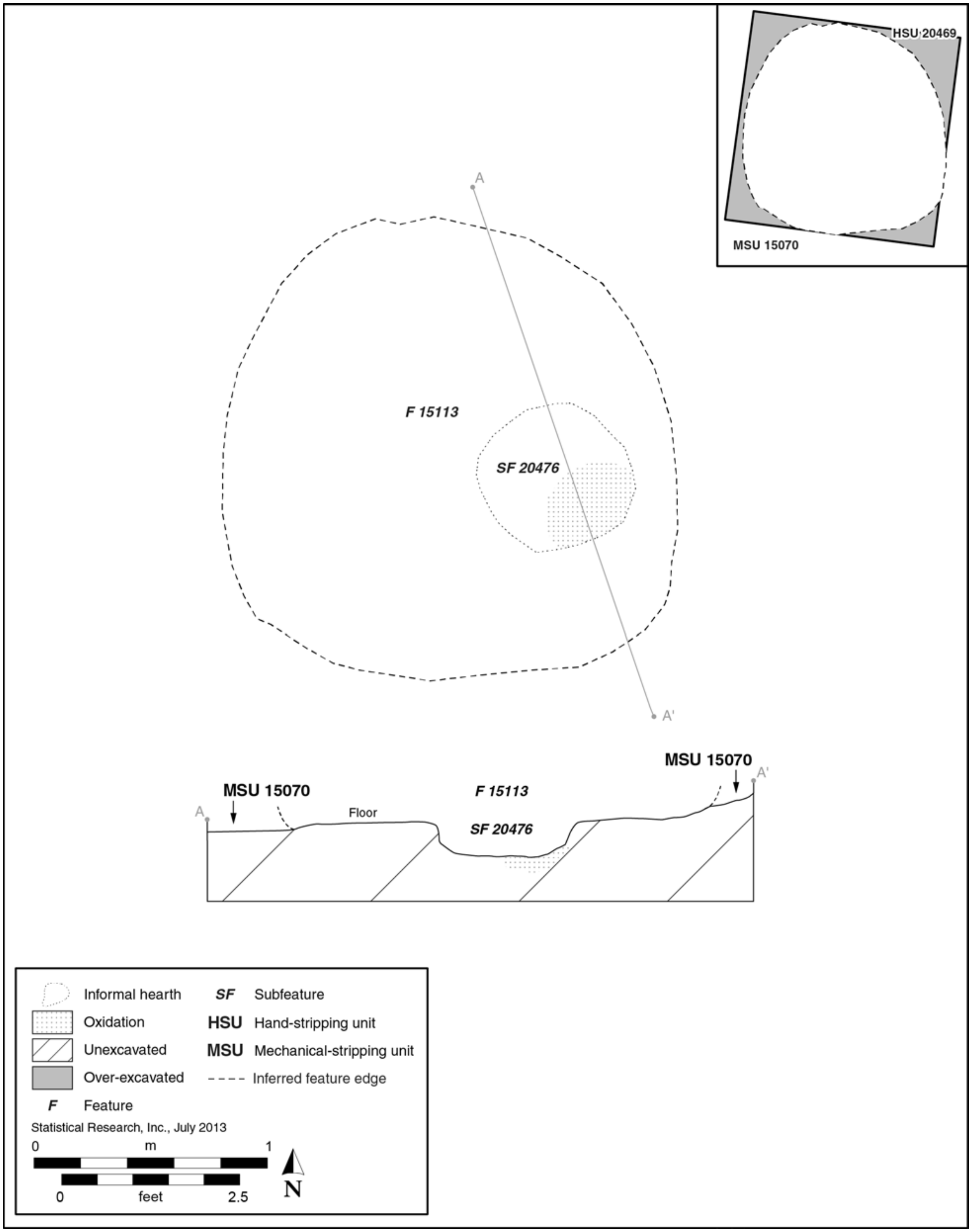

Figure 42. Post-excavation plan view and cross section of Feature 15113 (a structure) at Falcon Landing.

Figure 43. Photograph of the floor of Feature 15113 at Falcon Landing, view to the north.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

<u>**Diagnostic Material Culture**</u>
None.

<u>**Geochronologic Analysis**</u>
Feature 15113 originated at the surface of Unit II, with late Holocene alluvial-fan and sheet-flood deposits (Unit IIs/sf) overlying it. The unconformity between the surface of Unit II and Unit IIs/sf provides a geochronologic date of ca. 2730–2570 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

<u>**Radiocarbon Analysis**</u>
None.

Abandonment Processes
As evidenced by the natural alluvial and aeolian sediments, Feature 15113 was likely abandoned and then covered by natural processes. The lack of artifacts in the fill of the structure suggests that the structure did not have postabandonment refuse deposited and that it may have been dismantled prior to abandonment. The naturally deposited fill of the thermal pit (Subfeature 20476) is further evidence that Feature 15113 was dismantled prior to abandonment.

Stratigraphic Relationships and Associated Features

Feature 15113 originated at the surface of Unit II, with a geochronologic date that corresponds to the Chiricahua phase. No features were in contact with the structure. Most of the extramural pits near the structure were in a cluster to the north (see Appendix A). Eight pits within 10 m of Feature 15113 were in the same stratigraphic position as the structure. Features 14893, 15099, 15114, 15115, 20461, 20462, 20463, and 20464 were potentially contemporaneous with the structure. The other neighboring pits were in Unit IIs/sf and dated to the Middle to Late Archaic period, a time span that overlaps with the dates of Feature 15113: Features 14894, 14895, 14896, 14897, 14898, 14899, 14903, 20426, 20454, 20455, 20457, 20458, 20459, and 20460.

Middle to Late Archaic Period Component

Feature 3521

Structure type: house-in-pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: A3
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 7.31
Effective floor area (m^2): 7.00
Orientation: indeterminate
Length (m): 3.80
Width (m): 3.00
Excavated depth (m): 0.14
Volume (m^3): 1.200

Excavation Methods

Feature 3521 was a Middle to Late Archaic period house-in-pit (see Table 10). It was first identified during mechanical stripping of MSU 3512, appearing as an organic stain with flaked stone (see Appendix A). A 1-by-2-m control unit (TP 6214) was placed in the northern half of the feature. TP 6214 was excavated in a 10-cm level of feature fill and a 5-cm level of floor fill. The remainder of the feature was removed in two sections: SEC 6255, over the northeastern third of the structure, and SEC 6252, over the remaining, southwestern portion. Each section was excavated in two arbitrary levels, terminating at the floor of the structure (Figure 44).

Feature Fill

The structure fill was a single stratum of loosely compact brown silt loam with inclusions of sand, small gravels, and rounded pebbles. No charcoal was present. Artifacts recovered from the fill included two pieces of flaked stone debitage and three pieces of faunal bone. Bioturbation in the form of insect, animal, and plant disturbance was visible throughout the fill. A large basin metate (PD 3518) was identified above the fill of Feature 3521, but it was interpreted as postdating the structure and, therefore, not associated with the structure.

Construction Details

Walls and Roof

Feature 3521 was built within an ovate, 0.14-m-deep pit. Thirteen postholes were indentified (Figure 45; Table 19; see Figure 44). Ten were along the inside perimeter of the pit, and 3 were slightly inset toward the interior. The posts may have supported a small brush-and-grass superstructure.

Floor

The floor consisted of the natural substrate. It contained a higher proportion of silt and carbonates than the feature fill and was more compact. Insect and root activity had impacted the floor. Intramural features were visible on the floor upon its exposure. No artifacts were in contact with the surface.

Entry

No entry was identified.

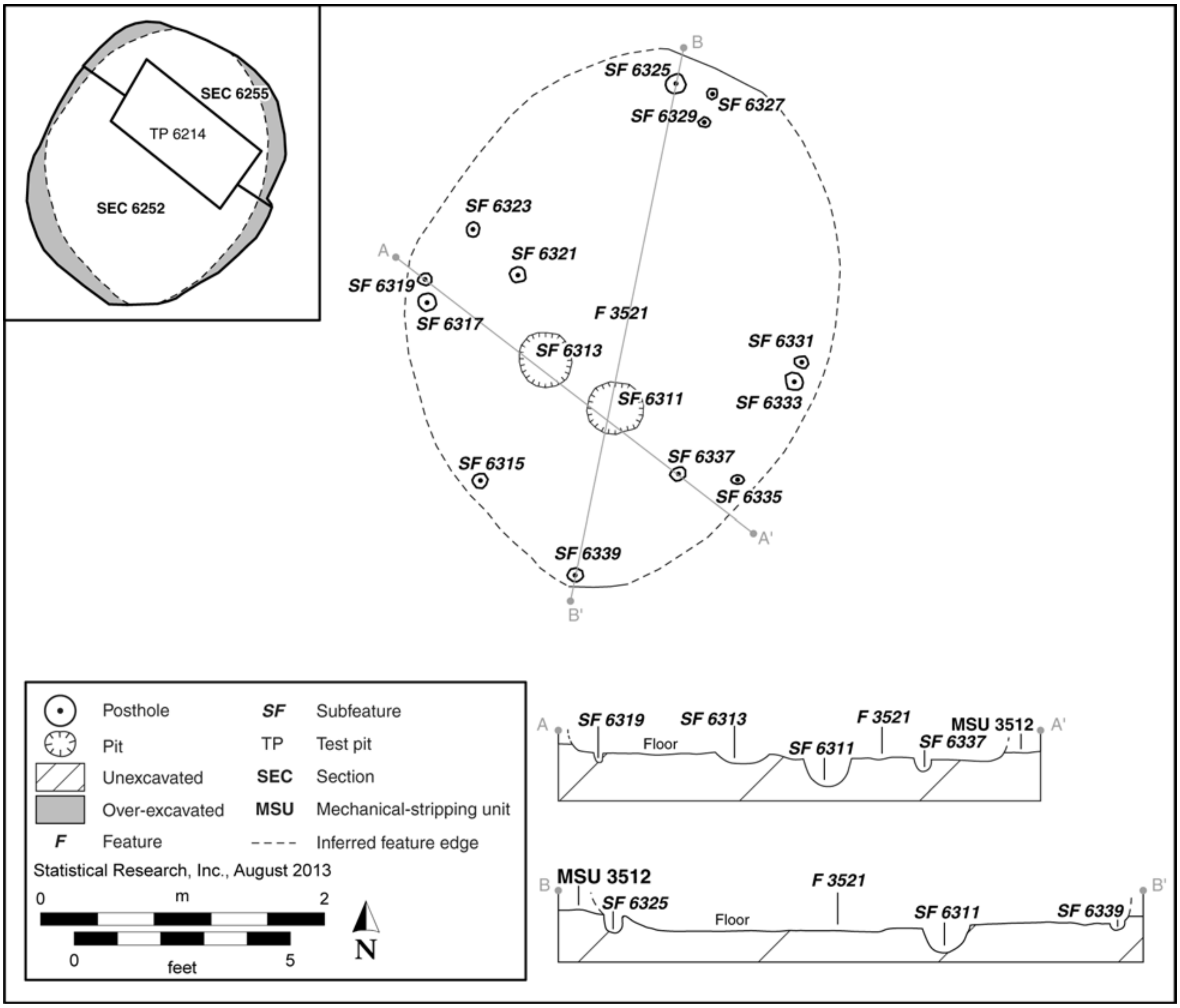

Figure 44. Post-excavation plan view and cross sections of Feature 3521 (a structure) at Falcon Landing.

Figure 45. Photograph of the floor of Feature 3521 at Falcon Landing, view to the south.

Table 19. Intramural Features in Feature 3521 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
6311	circular	basin	0.38	0.35	0.17	0.0226
6313	circular	basin	0.40	0.37	0.08	0.0118
Posthole						
6315	circular	cylindrical	0.12	0.10	0.10	0.0012
6317	circular	cylindrical	0.14	0.13	0.07	0.0013
6319	circular	cylindrical	0.12	0.12	0.08	0.0012
6321	circular	cylindrical	0.13	0.11	0.08	0.0011
6323	circular	cylindrical	0.10	0.10	0.09	0.0009
6325	circular	cylindrical	0.16	0.16	0.11	0.0028
6327	circular	cylindrical	0.10	0.10	0.05	0.0005
6329	circular	cylindrical	0.10	0.10	0.06	0.0006
6331	ovate	cylindrical	0.14	0.10	0.09	0.0013
6333	circular	cylindrical	0.15	0.14	0.09	0.0019
6335	circular	cylindrical	0.10	0.10	0.06	0.0006
6337	circular	cylindrical	0.15	0.15	0.08	0.0018
6339	circular	cylindrical	0.12	0.12	0.08	0.0012

Interior Features

Two intramural pits (Subfeatures 6311 and 6313) originated on the floor of Feature 3521. Subfeature 6311 was a circular, basin-shaped nonthermal pit located in the south-central portion of the structure. Macrobotanical and pollen samples obtained from Subfeature 6311 were sent for further analysis (see Chapters 6 and 7, Volume 2). A single piece of faunal bone was recovered from the pit. Subfeature 6313 was a shallow, nonthermal pit near the center of the structure (see Figure 44). Its fill contained no cultural material.

Evidence of Remodeling

No evidence of remodeling was found.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 3521 was located within Unit III1. The bracketing age range for Unit III1 is ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of burned mesquite (*Prosopis* sp.) wood was recovered from Subfeature 6311 and submitted to Aeon for AMS analysis. The charcoal returned a 2σ calibrated date range of 1320–1120 cal. B.C. (Aeon Sample No. 1437). This date range corresponds to the Middle to Late Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

The feature fill contained few artifacts and was likely deposited by natural processes. No lamination from wind-borne or water-deposited sediment was visible, but it may have been obscured by animal and plant disturbance. The structure did not appear burned or trash filled; however, charcoal was recovered from Subfeature 6311 but was not observed in the rest of the structure fill, which may indicate that the structure burned, and then was abandoned and left open.

Stratigraphic Relationships and Associated Features

The geochronologic date range of Feature 3521 was further refined by a radiocarbon result that placed the structure in the Middle to Late Archaic period. No features were within 10 m of Feature 3521. Two nonthermal pits were present 11 m to the northeast. Features 3628 and 3629 dated to the Middle to Late Archaic period and are potentially contemporaneous with the structure.

Feature 4349

Structure type: house-in-pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: D2
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m^2): 3.56
Effective floor area (m^2): 3.42
Orientation: indeterminate
Length (m): 2.45
Width (m): 2.00
Excavated depth (m): 0.13
Volume (m^3): 0.550

Excavation Methods

Feature 4349 was a Middle to Late Archaic period house-in-pit (see Table 10). The structure was discovered during mechanical excavation of MSU 4342 (see Appendix A), appearing as a large charcoal-stained area in the stripping unit. Hand-excavation began with a 1-by-2-m control unit (TP 2869) placed within the southern extent of the stain. It was excavated in two 10-cm-deep levels to the structure floor. Upon reaching the floor, it became evident that Levels 1 and 2 of TP 2869 extended beyond the southern edge of the structure (Figure 46). The remaining structure fill was excavated in two sections (SECs 2903 and 2916). SEC 2903 was excavated in a single level down to the floor, and SEC 2916 was excavated in one arbitrary level and one that stopped at the structure floor. The upper 0.05 m of both sections were over-excavated in the attempt to interpret the pit edges and identify the relationship with Feature 4346, an intrusive pit (see Figure 46). Macrobotanical samples from Levels 1 and 2 of the structure fill and a pollen sample from Level 1 were submitted for analysis (see Chapters 6 and 7, Volume 2).

Feature Fill

The structure fill consisted of two strata. The upper stratum was a homogeneous yellowish brown silt loam with a low density of charcoal flecking throughout. The bottom 5–6 cm of feature fill were composed of reddish brown channel sand with sparse charcoal inclusions. The natural channel removed the eastern half and northern third of the floor (see Figure 46). Artifacts in the structure included 178 pieces of flaked stone debitage and 55 pieces of faunal bone (see Table 10). The majority of the artifacts (89 percent) were collected from Level 1. Seven pieces of FAR were observed but not collected.

Construction Details

Walls and Roof

Six postholes were seen and excavated within this structure (Figure 47; Table 20; see Figure 46). The fill of these postholes was similar to that of the structure. All were located in the southwestern corner of the feature, because the remainder of the floor had been destroyed by a natural channel. The posts probably supported brush walls and a roof.

Floor

The floor was intact only in the southwestern third of the structure. It was an unprepared, use-compacted surface with caliche filaments. No artifacts were in contact with the floor.

Entry

No entryway was noted during the excavations.

Interior Features

Two intramural pits originated at the structure floor (Subfeatures 4442 and 4444) (see Figure 46; Table 20). Subfeature 4442 was a thermal pit located in the center of the structure. It was 0.04 m in depth and had an irregular, basin-shaped profile. It contained a loose brown silt with sparse, small charcoal inclusions. The base of the pit was slightly oxidized. Subfeature 4444 was a nonthermal pit in the southwestern corner of the structure. It contained a loose, grayish brown sandy silt with a very small amount of charcoal flecking.

Evidence of Remodeling

No obvious evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 4349 originated in Unit III1. The bracketing age for Unit III1 is ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

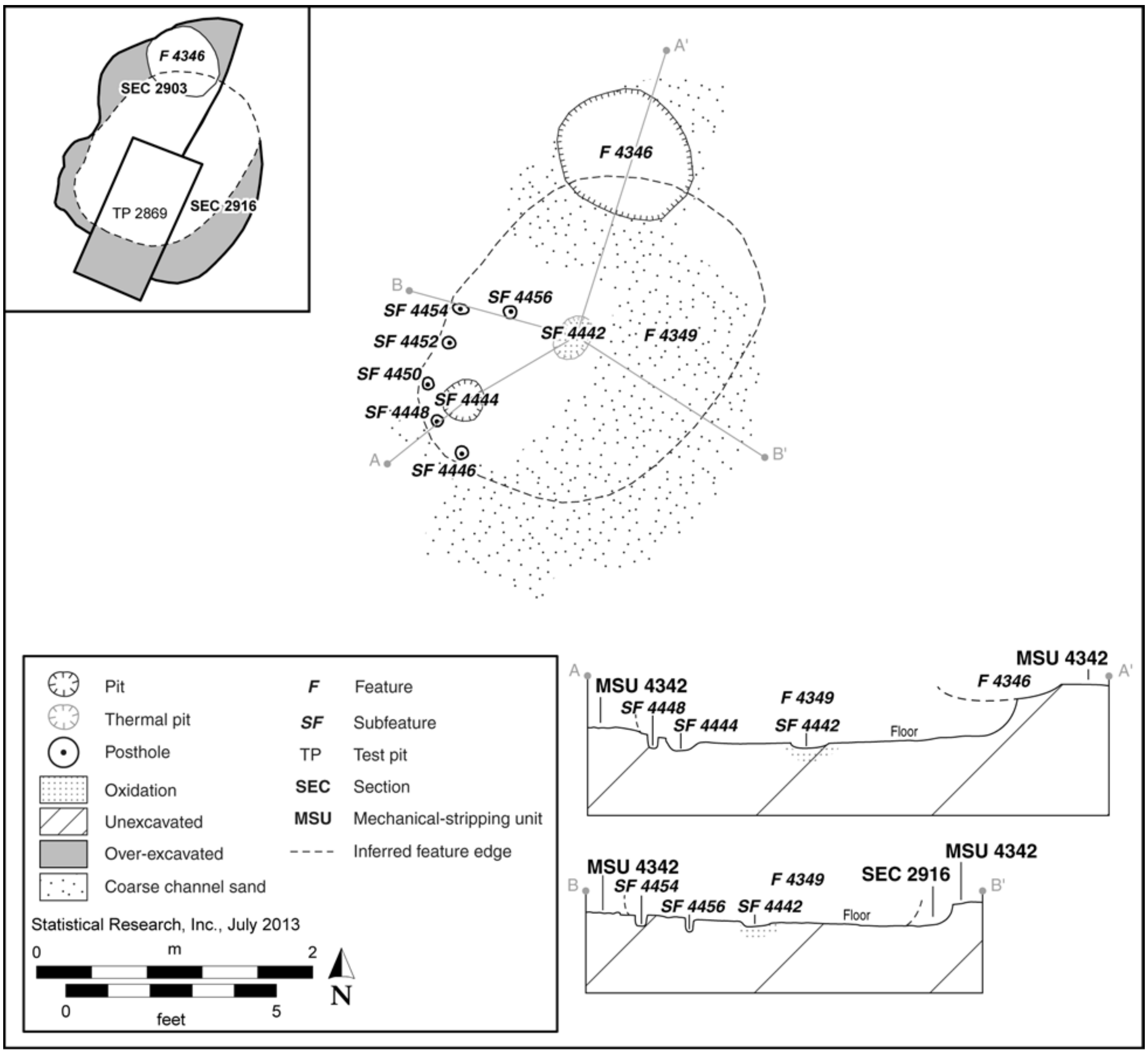

Figure 46. Post-excavation plan view and cross sections of Features 4349 (a structure) and 4346 (an intrusive pit) at Falcon Landing.

Figure 47. Photograph of the floor of Feature 4349 at Falcon Landing, view to the west.

Table 20. Intramural Features in Feature 4349 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Thermal pit						
4442	ovate	irregular	0.31	0.22	0.04	0.0027
Nonthermal pit						
4444	circular	basin	0.26	0.23	0.09	0.0054
Posthole						
4446	circular	cylindrical	0.12	0.10	0.10	0.0012
4448	circular	cylindrical	0.13	0.12	0.08	0.0012
4450	circular	cylindrical	0.12	0.12	0.10	0.0014
4452	circular	cylindrical	0.14	0.11	0.10	0.0015
4454	circular	cylindrical	0.16	0.13	0.08	0.0017
4456	circular	cylindrical	0.12	0.12	0.12	0.0017

Radiocarbon Analysis

None.

Abandonment Processes

The structure does not appear to have burned. A layer of alluvial sand with few artifacts was present in the base of the structure and in the postholes and appears to represent a flooding episode. The fill above that contained a much higher density of artifacts and may represent refuse that was purposely deposited in the house pit during the occupation of the site.

Stratigraphic Relationships and Associated Features

Feature 4349 was constructed within Unit III1. The date range for this unit corresponds to the Middle to Late Archaic period. Two other structures and several extramural pits are dispersed within a 10-m radius of the structure (see Appendix A). An intrusive thermal pit, Feature 4346, was cut into the northern edge of Feature 4349 (see Figure 46). Two Chiricahua phase house-in-pit structures were located to the north of Feature 4349.

Neighboring extramural pits that were temporally associated include Features 2967, 4343, 4345, 4370, and 4397, all of which originated in Unit III1. Features 2967 and 4343 were radiocarbon dated to the San Pedro phase. Other nearby features existed in a stratigraphic unit that dates to the Early to Middle Archaic period: Features 4350, 4353, and 4354.

Feature 8561

Structure type: surface structure
Age: Middle to Late Archaic period
Locus: Area B
Grid location: C2
Level of effort: complete
Plan-view shape: irregular
Cross-sectional shape: flat

Total floor area (m^2): 6.76
Effective floor area (m^2): 6.75
Orientation: indeterminate
Length (m): 4.40
Width (m): 2.20
Excavated depth (m): 0
Volume (m^3): not applicable

Excavation Methods

Feature 8561 was a possible surface structure dating to the Middle to Late Archaic period (see Table 10). The structure was originally identified during mechanical excavation of MSU 3873, when four postholes were identified (see Appendix A). HSU 7479 was placed over the area and excavated in an attempt to identify additional subfeatures, a floor, or an activity area (Figure 48). No additional subfeatures were identified, but a cluster of flaked stone debitage was found in contact with a surface.

Feature Fill

No structure fill was observed, and the architecture was limited to the four postholes. Two artifacts were recovered during the excavation of HSU 7479, including one flaked stone scraper and one piece of faunal bone (see Table 10). A few pieces of FAR were noted but not collected.

Construction Details

Walls and Roof

Four postholes were the only structural elements of the feature (Figure 49; Table 21). The four postholes were arranged in a trapezoidal pattern, and there was no evidence of a structure pit (see Figure 48). The structure is tentatively characterized as a ramada; however, the presence of only four postholes is admittedly slim evidence for the interpretation of this feature as a structure. Be that as it may, the evidence indicating that Feature 8561 could be a structure or ramada suggests it was likely constructed on the aboriginal ground surface. So, it likely did not have enclosed walls. The posts likely supported a flat brush-and-grass roof.

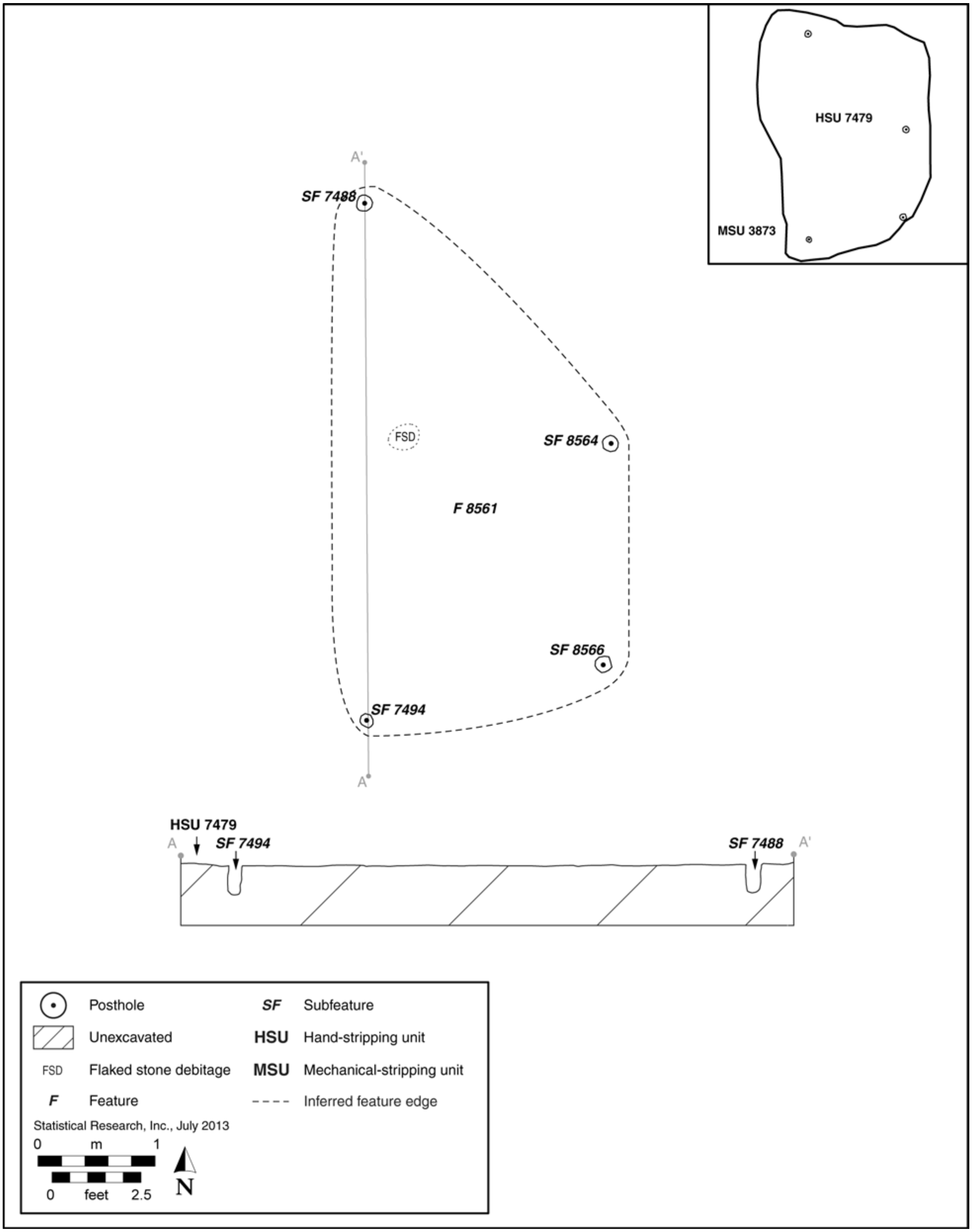

Figure 48. Post-excavation plan view and cross section of Feature 8561 (a structure) at Falcon Landing.

Figure 49. Photograph of the floor of Feature 8561 at Falcon Landing, view to the north–northwest.

Table 21. Intramural Features in Feature 8561 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Posthole						
7488	circular	cylindrical	0.13	0.13	0.23	0.0039
7494	circular	cylindrical	0.13	0.13	0.25	0.0042
8564	circular	cylindrical	0.12	0.12	0.24	0.0035
8566	circular	cylindrical	0.12	0.12	0.20	0.0029

Additional postholes possibly existed at one point in time but may not have survived natural disturbances. The posthole fill was a loose, dark yellowish brown silt loam with sparse charcoal flecks and no artifacts.

Floor
The surface consisted of the natural substrate. Five pieces of flaked stone debitage of the same material type were found in a cluster on the surface (see Figure 48).

Entry
No entryway was noted during the excavations (see Figure 48).

Interior Features
No intramural pits were present.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 8561 originated in Unit III1. The bracketing age range for Unit III1 is ca. 1380–920 B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
Feature 8561 was probably abandoned and then covered by alluvial and aeolian sediments. There is no evidence that the structure burned.

Stratigraphic Relationships and Associated Features
Feature 8561 was constructed within Unit III1, which provided a date range corresponding to the Middle to Late Archaic period. Twelve extramural pits were located within 10 m of the ramada (see Appendix A): nine nonthermal pits (Features 3040, 3113, 3957, 3958, 3966, 3967, 3968, 3977, and 3979), an FAR concentration (Feature 3991), a charcoal/ash lens (Feature 3992), and an artifact cache (Feature 3993). Nearly all were in the same stratigraphic unit and are potentially contemporaneous with Feature 8561.

Feature 14948
Structure type: house-in-pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: D6
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Total floor area (m^2): 2.29
Effective floor area (m^2): 2.26
Orientation: indeterminate
Length (m): 1.90
Width (m): 1.62
Excavated depth (m): 0.22
Volume (m^3): 0.530

Excavation Methods
Feature 14948 was a possible house-in-pit that dated to the Middle to Late Archaic period (see Table 10). The feature was identified during mechanical excavation of MSU 11008 (see Appendix A). Upon identification, it appeared as a circular, organic stain containing dispersed charcoal flecking. Because of its relatively small size (1.9 m in diameter), the feature was originally interpreted as a pit, and a control unit was not excavated. The feature was hand-excavated in two sections (SECs 18335 and 18338) (Figure 50) and was then interpreted as a structure based on shallow pit depth, a basin shape, an interior posthole, and similarities to another nearby structure (Feature 14949) (see Appendix A).

The sections ended upon exposure of the structure floor, which consisted of a relatively compact and continuous earthen surface. Because of shallow depth and lack of stratigraphy, both sections were excavated in one level. A flotation sample was recovered from SEC 18338, and the remaining sediment from both sections was worked through 1/4-inch mesh. A pollen sample was also scraped from the structure floor.

Feature Fill
A single stratum was present in the fill of Feature 14948. It consisted of a soft, light brown sandy loam containing sparse, dispersed charcoal flecking and ash. The fill displayed laminated sediments consistent with

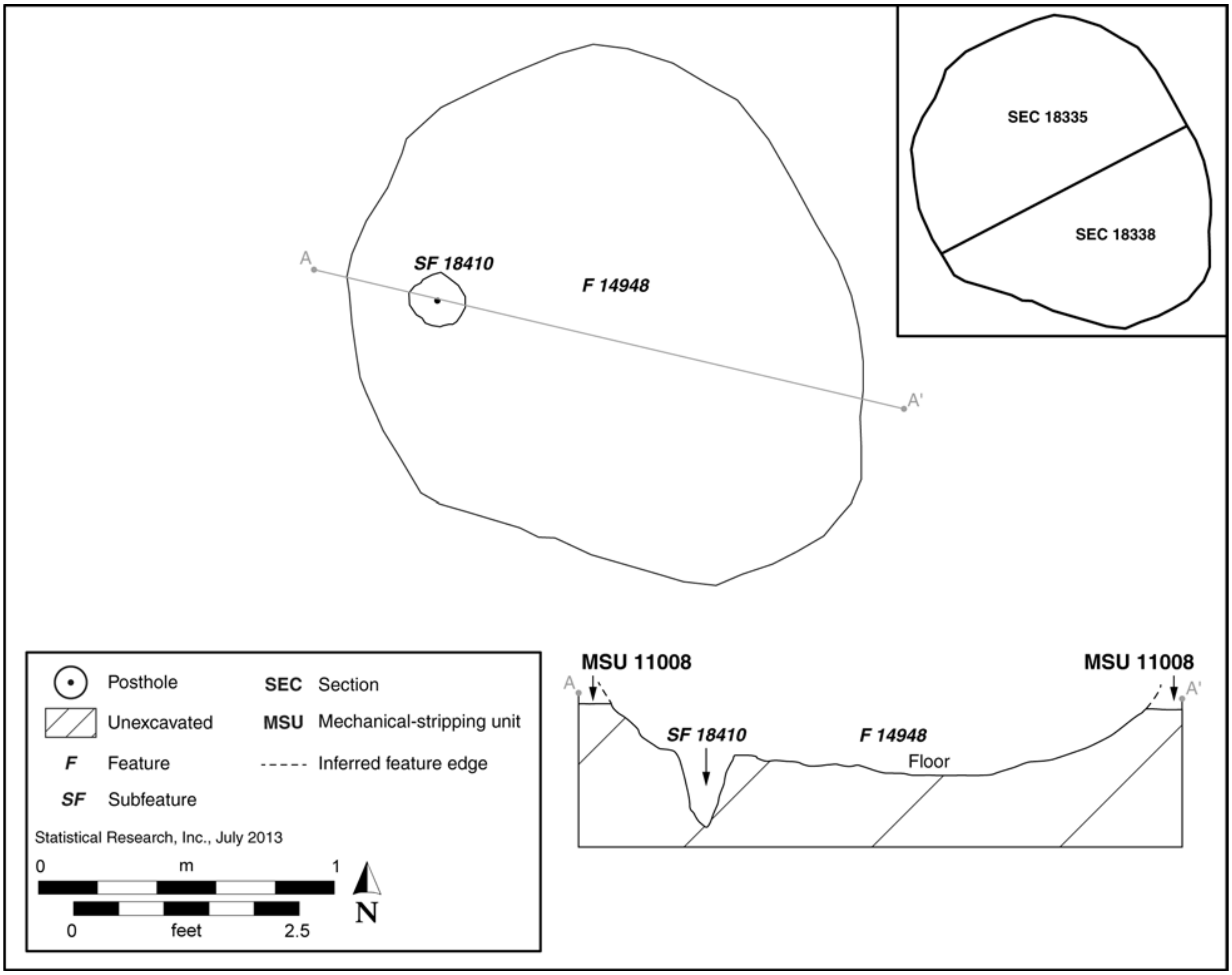

Figure 50. Post-excavation plan view and cross section of Feature 14948 (a structure) at Falcon Landing.

aeolian and alluvial deposition. Artifacts within the structure fill included a complete mano and three pieces of flaked stone debitage (see Table 10).

Construction Details

Walls and Roof

Feature 14948 was built either in or around a 0.22-m-deep circular pit (Figure 51). Whether the structure was in or surrounding the pit was impossible to interpret, because only a single posthole (Subfeature 18410) was identified in the structure floor (see Figure 50). Additionally, architectural debris was not present within the structure fill, and coupled with the lack of postholes, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure. The posthole was located in the western end of the structure, originating at the floor surface. The posthole was 0.19 by 0.17 m in plan view and 0.26 m in depth. The fill was a soft, light brown sandy loam similar to the structure fill. Sparse, dispersed charcoal flecking was noted throughout.

Figure 51. Photograph of the floor of Feature 14948 at Falcon Landing, view to the north.

Floor
The floor of the structure consisted of the natural substrate, which displayed noticeable use compaction. No artifacts were found in contact with the floor.

Entry
No entryway was discernible.

Interior Features
None.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 14948 originated in Unit IIs/sf. The bracketing date range for this unit is ca. 2570–790 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The structure fill was indicative of wind-borne and water-lain deposits and possessed no evidence of structural debris. These sediments were in contact with the floor, suggesting that the structure was dismantled upon abandonment and then infilled naturally. The relatively small amount of charcoal and the lack of architectural debris in the structure fill, as well as no oxidation or charcoal staining on the floor, indicate that the structure did not burn.

Stratigraphic Relationships and Associated Features
Structure Feature 14948 originated within Unit IIs/sf, providing a geochronologic date range that corresponds to the Middle to Late Archaic period. Another structure and 17 extramural pits were located within 10 m of Feature 14948 (see Appendix A). Feature 14949, located 4.3 m to the south, was another house-in-pit and originated in the same stratigraphic unit as Feature 14948. The two structures are possibly contemporaneous. Extramural pits in the same stratigraphic unit include Features 14938, 14950, 14953, 14954, 18367, 18368, 18383, 18384, and 18389. A single nonthermal pit dating to the Late Archaic to Pioneer period, Feature 11029, was also potentially contemporaneous. Other features in the vicinity postdated Feature 14948.

Feature 14949
Structure type: house-in-pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: D6
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Total floor area (m^2): 1.82
Effective floor area (m^2): 1.81
Orientation: indeterminate
Length (m): 1.60
Width (m): 1.50
Excavated depth (m): 0.30
Volume (m^3): 0.580

Excavation Methods
Feature 14949 was a possible house-in-pit that dated to the Middle to Late Archaic period (see Table 10). The feature was identified during mechanical excavation of MSU 11008 (see Appendix A). Upon identification, it appeared as a circular, organic stain containing sparse, dispersed charcoal flecking. Because of the relatively small size (1.6 m in diameter), the feature was originally interpreted as a pit, and a control unit was not excavated. The feature was hand-excavated in two sections (SECs 18370 and 18400) (Figure 52) and, upon excavation, was interpreted as a structure because of its shallow depth, its basin shape, an interior posthole, and its similarities to another nearby structure (Feature 14948) (see Appendix A).

The sections ended upon exposure of the structure floor, which consisted of a relatively compact and continuous earthen surface. SEC 18370 was excavated in one arbitrary, unscreened level, but a flotation sample was recovered from the fill. SEC 18400 was excavated in two levels that were defined stratigraphically. A ^{14}C sample was taken from Level 1 (fill), and a flotation sample was taken from Level 2 (floor fill). All other sediment from SEC 18400 was screened through $^1/_4$-inch mesh. Following section excavations, pollen and flotation samples were scraped from the structure floor.

Feature Fill
A single stratum was present in the fill of Feature 14949. It consisted of a slightly hard yellowish brown sandy clay loam containing sparse, dispersed charcoal flecking. The fill displayed laminated sediments consistent with aeolian and alluvial deposition. Architectural debris was not present. Two pieces of flaked stone debitage were the only artifacts present within the structure fill (see Table 10).

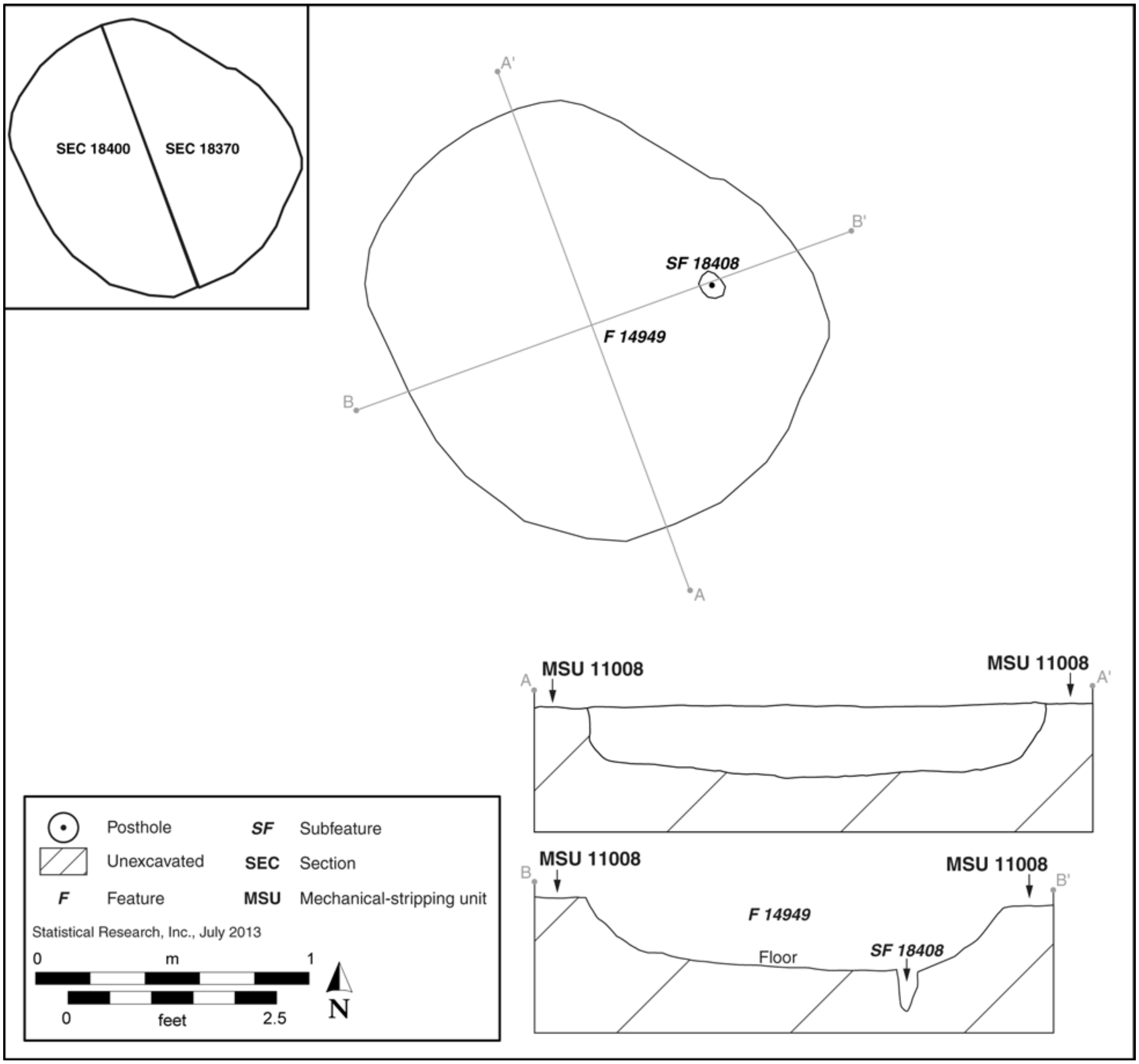

Figure 52. Post-excavation plan view and cross sections of Feature 14949 (a structure) at Falcon Landing.

Construction Details

Walls and Roof

Feature 14949 was built either in or around a 0.30-m-deep circular pit (Figure 53). Whether the structure was in or surrounding the pit was impossible to interpret, because only a single posthole (Subfeature 18408) was identified (see Figure 52). Additionally, architectural debris was not present within the structure fill, and coupled with the lack of postholes, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure. The posthole was located in the eastern portion of the structure, originating at the floor surface. The posthole was 0.09 by 0.09 m in plan view and 0.15 m in depth. The fill was a yellowish brown sandy clay loam that was similar to the structure fill.

Figure 53. Photograph of the floor of Feature 14949 at Falcon Landing, view to the north-northeast.

Floor

The floor of the structure consisted of the natural substrate, which displayed noticeable use compaction. No artifacts were found in contact with the floor.

Entry

No entryway was discernible.

Interior Features

None.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 14949 originated in Unit IIs/sf. The bracketing age range for this unit is ca. 2570–790 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

The structure fill was indicative of wind-borne and water-lain deposits and possessed no evidence of structural debris. These sediments were in contact with the floor, suggesting that the structure was dismantled upon abandonment and then infilled naturally.

Stratigraphic Relationships and Associated Features

Feature 14949 originated within Unit IIs/sf, which has a geochronologic date range that corresponds to the Middle to Late Archaic period. Another structure and 17 extramural pits existed within 10 m of Feature 14949 (see Appendix A). Feature 14948, located 4.3 m to the north, was another house-in-pit and originated in the same stratigraphic unit as Feature 14949. The two structures are possibly contemporaneous. Extramural pits in the same stratigraphic unit include Features 14938, 14950, 14953, 14954, 18367, 18368, 18383, 18384, and 18389. Two pits dating to the Late Archaic to Pioneer period, Features 11024 and 11029, were also potentially contemporaneous. Other features in the vicinity postdated Feature 14949.

Feature 17681

Structure type: house-in-pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: E2
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin
Total floor area (m^2): 3.27
Effective floor area (m^2): 3.27
Orientation: indeterminate
Length (m): 2.50
Width (m): 1.60
Excavated depth (m): 0.35
Volume (m^3): 1.080

Excavation Methods

Feature 17681 was a possible house-in-pit that dated to the Middle to Late Archaic period (see Table 10). The structure was identified during manual excavation of Feature 15082, an activity area (see Appendix A). It was discovered in TP 17053, which was originally the control unit for the activity area. One intrusive nonthermal pit (Feature 15083) was also identified and excavated prior to the identification of Feature 17681 (Figure 54).

Identification and excavation of Feature 17681 began with the excavation of an intrusive nonthermal pit (Feature 15083). Following the excavation of Feature 15083, a 1-by-1-m control unit (TP 17053) was placed within a large, irregularly shaped, organic stain that surrounded Feature 15083 and corresponded to the activity area (Feature 15082). The control unit was excavated in two arbitrary 0.10-m-deep levels. Excavation revealed the activity area (Feature 15082) as well as the southern edge of the structure (Feature 17681) (see Figure 54). Thereafter, the levels of TP 17053 were considered to be mixtures of several cultural strata. HSU 17396 was then initiated to help define additional artifacts and features associated with the activity area (Feature 15082), as well as the outline of the structure (Feature 17681). The HSU was also considered to be a mixture of several cultural strata and was excavated in one 0.04- to 0.13-m-deep level. It was after the excavation of HSU 17396 that the full outline of Feature 17681 was exposed, as well as the outline of an additional intrusive nonthermal pit (Feature 17253) (see Figure 54). After Feature 17253 was excavated, Feature 17681 was excavated in two sections (SECs 17682 and 17684). Both sections ended with the exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. The footprint of each section was slightly over-excavated, however, because of difficulties in defining the pit walls. SECs 17682 and 17684 were each dug in one level, within a single stratum. A flotation sample was recovered from both sections, and a pollen sample was scraped from the structure floor.

Feature Fill

A single stratum was present in the fill of Feature 17681. It consisted of a moderately hard light yellowish brown silty loam containing sparse charcoal, ash, and FAR. The fill was massive and also contained some coarse sand and caliche inclusions. No architectural debris was identified in the fill. In total, 20 artifacts were recovered, including 17 pieces of FAR, 2 metate fragments, and 1 pestle fragment (see Table 10).

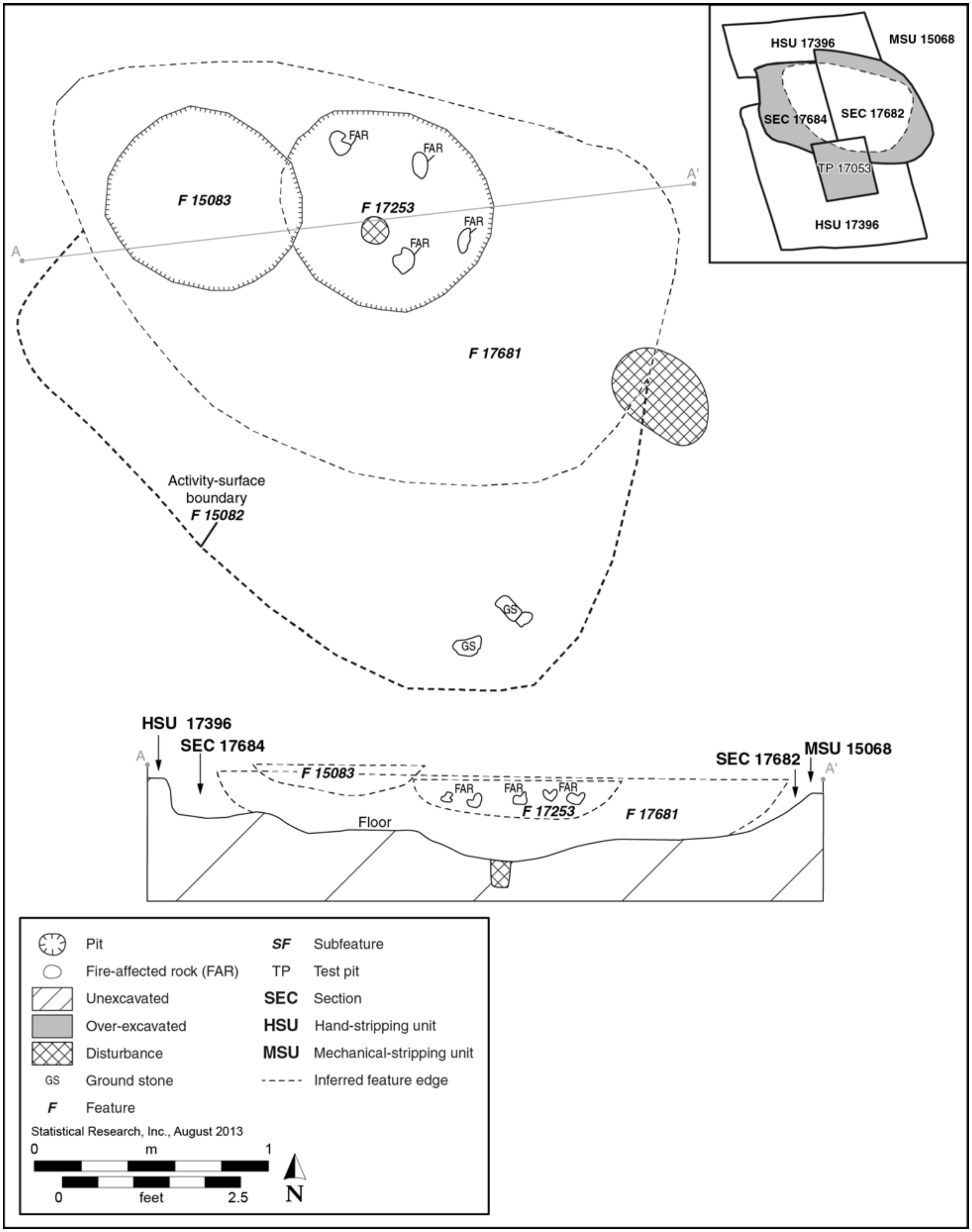

Figure 54. Post-excavation plan view and cross sections of Feature 17681 (a structure) and Features 15083 and 17253 (intrusive pits) at Falcon Landing.

Construction Details

Walls and Roof

Feature 17681 was built either in or around a pit that was at least 0.35 m in depth (Figure 55). The shape of the pit is largely inferred because of difficulties in defining the pit walls. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The floor of the structure consisted of the natural substrate. It did, however, display noticeable use compaction. No artifacts were found in contact with the floor.

Entry

No entryway was discernible.

Interior Features

None.

Evidence of Remodeling

No evidence of remodeling was observed.

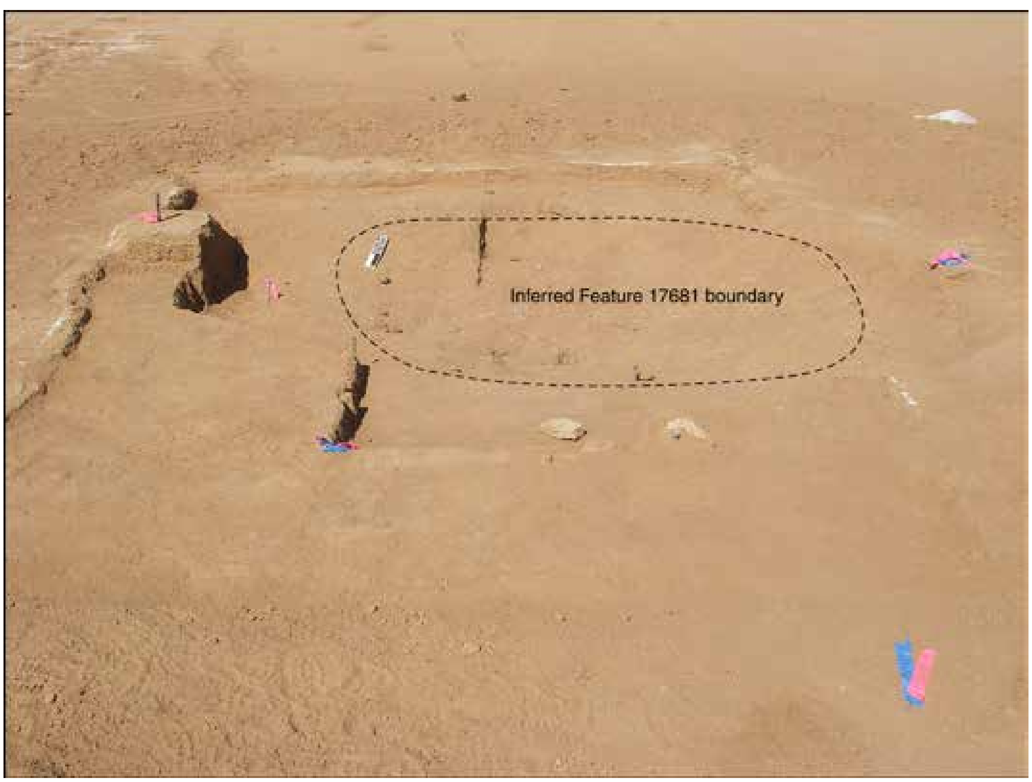

Figure 55. Photograph of the floor of Feature 17681 at Falcon Landing, view to the north.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 17681 originated in Unit III1. The bracketing age range for this unit is ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes

The presence of FAR and other artifacts throughout the structure fill may be the result of trash disposal within the structure pit shortly after abandonment. The relatively small amount of charcoal and the lack of architectural debris in the structure fill, as well as the absence of oxidation or charcoal staining on the floor, indicate that the structure did not burn. It is unclear whether the structure was dismantled or naturally decomposed. The massive silty loam sediments within the structure suggest filling by natural alluvial or aeolian process following abandonment.

Stratigraphic Relationships and Associated Features

The geochronologic date range for Feature 17681 corresponds to the Middle to Late Archaic period. Two intrusive nonthermal pits, Features 15083 and 17253, also originated in Unit III1 (see Figure 54). An activity area (Feature 15082) surrounds the structure (see Appendix A) and was likely an associated aboriginal surface used during the life of the structure. Five extramural features were in the immediate vicinity of Feature 17681, and all are potentially contemporaneous. Four of the features originated in the same stratigraphic unit as the structure: two nonthermal pits (Features 3145 and 15074) and two FAR concentrations (Features 15073 and 15075). Another nonthermal pit (Feature 15081) originated in Unit IIs/sf and also dates to the Middle to Late Archaic period.

Middle Archaic to Pioneer Period Component

Feature 11105

Structure type: surface structure
Age: Middle Archaic to Pioneer period
Locus: Area B
Grid location: D5
Level of effort: complete
Plan-view shape: indeterminate
Cross-sectional shape: flat

Total floor area (m^2): 16.68
Effective floor area (m^2): 16.35
Orientation: indeterminate
Length (m): 5.25
Width (m): 5.20
Excavated depth (m): 0
Volume (m^3): not applicable

Excavation Methods

Feature 11105 was a Middle Archaic to Pioneer period surface structure (see Table 10). The structure was identified during mechanical excavation of MSU 11075 (see Appendix A). Upon identification, it appeared as a series of small, circular stains that appeared to represent a number of postholes. An associated structure pit was not present, and the feature was interpreted as a surface structure. Because no fill was present the feature had no control units or excavated sections. Each posthole was excavated individually in one unit and level (Figure 56). A flotation sample was collected from one of the postholes (Subfeature 12071) because it was found to contain charcoal. No other samples were collected.

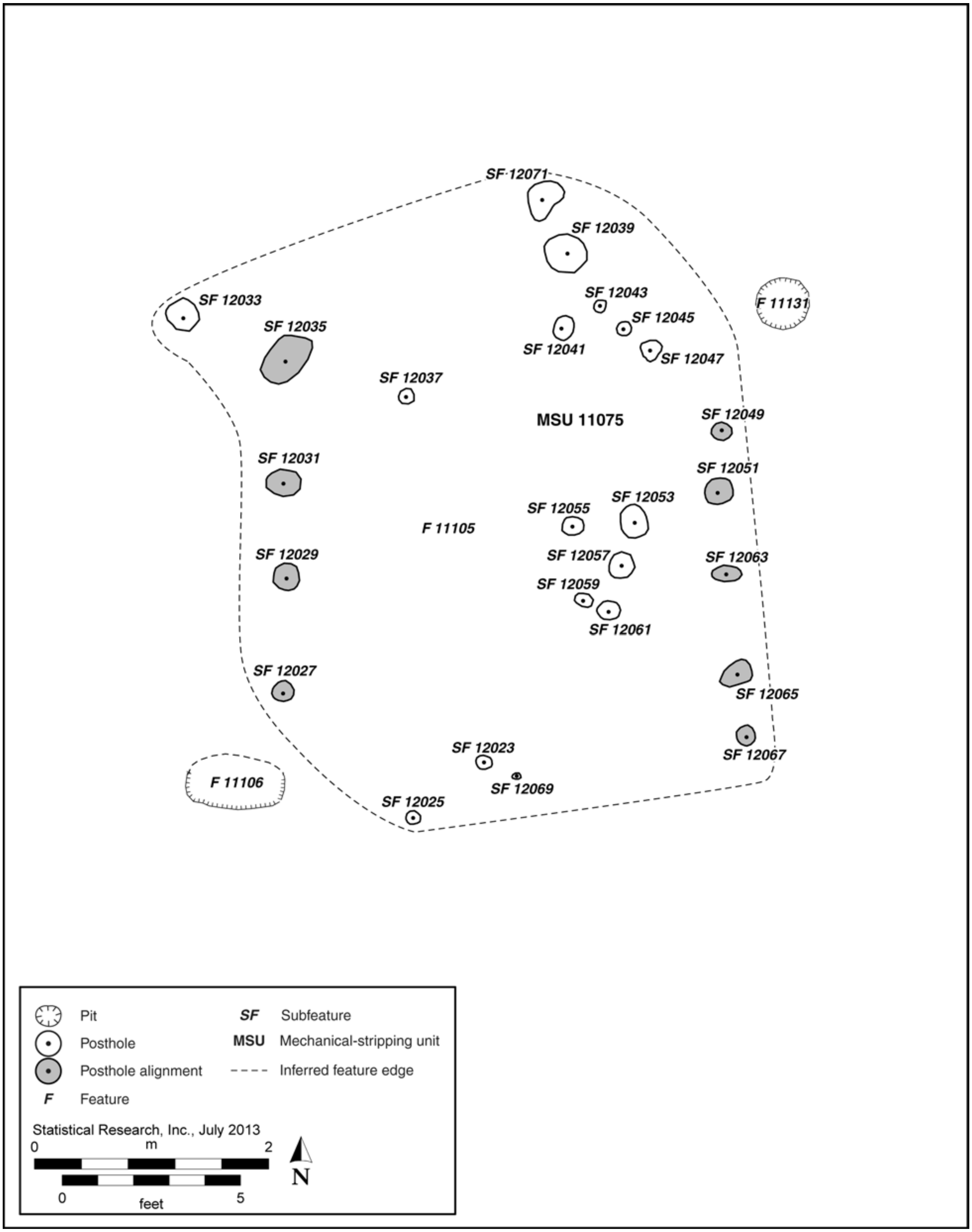

Figure 56. Post-excavation plan view of Feature 11105 (a structure) and Features 11106 and 11131 (nearby pits) at Falcon Landing.

Feature Fill

No feature fill was present.

Construction Details

Walls and Roof

Twenty-five postholes were located in an area measuring around 5 by 5 m (Figure 57; Table 22). They were excavated into the natural substrate and showed no evidence of burning, lining, or modification. The fill of all the postholes was a yellowish brown silty clay loam that was slightly darker than the natural substrate. Several displayed fine lamina consistent with sediment deposited by wind and water, but the depositional processes of most were difficult to interpret because of their small size. Two postholes contained sparse charcoal flecking (Subfeatures 12025 and 12071), but none displayed evidence of in situ burning. Artifacts were not present in any of the postholes, but charcoal from one of the postholes (Subfeature 12071) was submitted for further analysis (see Chapter 6, Volume 2). The structure is characterized as a ramada and was likely constructed on the aboriginal ground surface. The posts likely supported a flat brush-and-grass roof.

Two parallel alignments of postholes were present, extending generally north–south. The eastern alignment consisted of five postholes (Subfeatures 12049, 12051, 12063, 12065, and 12067), and the western alignment consisted of four postholes (Subfeatures 12027, 12029, 12031, and 12035). These posthole alignments likely represented the main-structure-wall-support posts (see Figure 56). Interestingly, these nine postholes were also some of the deepest in the feature, averaging 0.35 m in depth.

Three clusters of similarly sized postholes were also present but were perhaps not associated with the walls of the structure. One cluster (Subfeatures 12053, 12055, 12057, 12059, and 12061) was located in the east-central portion of the structure, another cluster (Subfeatures 12041, 12043, 12045, and 12047) was located in the northeastern portion of the structure, and a third cluster (Subfeatures 12023, 12025, and 12069) was located in the southern end of the structure (see Figure 56). These clusters could represent the

Figure 57. Photograph of the floor of Feature 11105 at Falcon Landing, view to the north–northeast.

Table 22. Intramural Features in Feature 11105 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Posthole						
12023	circular	cylindrical	0.16	0.14	0.25	0.0056
12025	circular	cylindrical	0.16	0.15	0.25	0.0060
12027	circular	conical	0.29	0.22	0.34	0.0217
12029	circular	cylindrical	0.25	0.24	0.33	0.0198
12031	circular	conical	0.31	0.28	0.30	0.0260
12033	circular	conical	0.33	0.32	0.04	0.0042
12035	irregular	conical	0.36	0.32	0.48	0.0553
12037	circular	cylindrical	0.17	0.16	0.26	0.0071
12039	circular	conical	0.40	0.39	0.06	0.0094
12041	circular	conical	0.16	0.15	0.22	0.0053
12043	irregular	conical	0.07	0.07	0.25	0.0012
12045	circular	cylindrical	0.18	0.14	0.26	0.0066
12047	circular	conical	0.22	0.20	0.30	0.0132
12049	circular	cylindrical	0.16	0.15	0.21	0.0050
12051	circular	conical	0.26	0.23	0.46	0.0275
12053	circular	conical	0.29	0.22	0.08	0.0051
12055	circular	conical	0.26	0.22	0.17	0.0097
12057	ovate	conical	0.28	0.19	0.04	0.0021
12059	circular	conical	0.16	0.14	0.03	0.0007
12061	circular	conical	0.20	0.19	0.05	0.0019
12063	ovate	conical	0.23	0.17	0.43	0.0168
12065	ovate	conical	0.28	0.20	0.35	0.0196
12067	circular	cylindrical	0.24	0.22	0.25	0.0132
12069	circular	conical	0.06	0.05	0.02	0.0001
12071	irregular	irregular	0.31	0.27	0.06	0.0050

remains of internal partitions, furniture, or other interior features. The postholes in the northeastern cluster were deeper than average, ranging from 0.22 to 0.30 m in depth (see Table 22).

Three of the largest (but shallowest) postholes (Subfeatures 12033, 12039, and 12071) were located at the northern end of the structure (see Figure 56). They averaged 0.35 m in diameter and 0.05 m in depth, and the other subfeatures averaged 0.22 m in diameter and 0.24 m in depth (see Table 22). These postholes appeared to be wall posts but diverged slightly from the north–south alignment recognized in the parallel wall postholes to the south. These large postholes may represent the remains of an exterior partition or other feature on the northern end of the structure.

Floor

The floor of the structure consisted of the natural substrate, which displayed noticeable use compaction. Ash staining and oxidation were not present. A single multidirectional core was found in contact with the surface.

Entry

Based on the two parallel posthole alignments, entry into the structure may have been from the north or south.

Interior Features

None.

Evidence of Remodeling
No discrete evidence of remodeling was observed.

Chronometric Dating

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 11105 was located at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit IIA surface and Unit IV provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), corresponding to the Middle Archaic to Pioneer period.

Radiocarbon Analysis
None.

Abandonment Processes
The fill of several postholes displayed wind-borne and water-lain deposits, but whether that indicates that the structure was dismantled upon abandonment is difficult to interpret. None of the postholes possessed evidence of burning, nor did the structure floor. The structure likely collapsed or was dismantled and was subsequently covered with natural alluvial or aeolian sediments. The structure likely had a planned abandonment, because only a single artifact (a core) was left on the floor surface.

Stratigraphic Relationships and Associated Features
Feature 11105 originated at the surface of geological Unit IIA, underlying Unit IV. Its stratigraphic position indicates that it was occupied during the Middle Archaic to Pioneer period. Although no absolute dates were obtained for the structure, an extramural nonthermal pit at its southwestern corner (Feature 11106) was radiocarbon dated (see Figure 56). It returned a 2σ calibrated date range of 790–520 cal. B.C. (Aeon Sample No. 1504), corresponding to the Early Cienega phase of the Late Archaic period. The relative location and stratigraphic position of Feature 11106 suggests that it may be contemporaneous with Feature 11105.

Several pits in the same stratigraphic position as Feature 11105 surrounded the structure (see Appendix A). These included nine nonthermal pits (Features 11103, 11104, 11106, 11107, 11108, 11128, 11129, 11130, and 11131) (see Figure 56) and one thermal pit (Feature 11102). Three other nonthermal pits (Features 11093, 11096, and 11124) were north and east of the structure, between 8 and 10 m away. A cache, Feature 3372, was 10 m to the southeast.

Middle Archaic to Protohistoric Period Component

Feature 2632
Structure type: house-in-pit
Age: Middle Archaic to Protohistoric period
Locus: Area A
Grid location: J3
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Total floor area (m^2): 2.43
Effective floor area (m^2): 2.31
Orientation: indeterminate
Length (m): 2.41
Width (m): indeterminate
Excavated depth (m): 0.91
Volume (m^3): indeterminate

Excavation Methods
Feature 2632 was a possible house-in-pit that dated sometime between the Middle Archaic to Protohistoric period (see Table 10). The structure was identified during Phase 1 investigations in the northern profile of

TR 2220 and was further defined by the mechanical stripping of MSU 4580 (see Appendix A). The southern portion of the structure was removed during initial excavations by TR 2220. In plan view, the structure appeared as a small, semicircular, organic stain that contained charcoal and ash. A 1-by-2 m control unit (TP 7634) was first excavated near the center of the stain. The remainder of structure fill was then removed in one unit (SEC 7638) (Figure 58). Because of shallow depth and lack of stratigraphy, each unit was excavated to the floor in a single level. The floor consisted of a relatively compact, continuous, and hard earthen surface. The northeastern corner of TP 7634 was over-excavated beyond the structure edge (see Figure 58). Flotation and pollen samples were not taken from SEC 7638, because the volume of sediment was too small.

Feature Fill

A single stratum was present within Feature 2632. It consisted of a brown sandy clay with some silt inclusions. Within the fill were a few pieces of charcoal, which increased with depth. The artifacts were five pieces of faunal bone. A pollen sample and a macrobotanical sample taken from TP 7634 were submitted for further analysis (see Chapters 6 and 7, Volume 2).

Construction Details

Walls and Roof

Feature 2632 was built either in or around a 0.22-m-deep pit. The pit was likely circular, but it had been truncated by TR 2220. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. Because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The floor of Feature 2632 consisted of the natural substrate and exhibited no preparation (Figure 59). It did, however, display noticeable use compaction. Some rodent and plant disturbances were also present. No artifacts were in contact with the floor.

Entry

No entry was discernible.

Interior Features

Two nonthermal pits (Subfeatures 7648 and 7650) originated at the structure floor, and the southern ends of both pits were removed by TR 2220 (Table 23). Subfeature 7648 was located in the eastern portion of the structure and was truncated by the excavation of TR 2220 (see Figure 58). This subfeature was cylindrical in cross section and roughly circular in plan view and contained two distinct strata. The upper stratum was a brown sandy clay measuring 0.17 m thick. It was similar in composition to the structure fill. The lower stratum was a pure, fine aeolian-sand deposit that was 0.08 m thick. No artifacts were present in this pit, but macrobotanical and pollen samples were submitted for further analysis (see Chapters 6 and 7, Volume 2).

Subfeature 7650 was located near the center of the pit structure, to the west of Subfeature 7648 (see Figure 58), and was also truncated by TR 2220. The same strata seen in Subfeature 7648 were identified in Subfeature 7650. The upper stratum was 0.15 m thick and contained some charcoal. The lower stratum was 0.08 m in depth. The pit was conical in cross section and roughly ovate in plan view. No artifacts were recovered. Macrobotanical and pollen samples recovered from the upper fill were submitted for further analysis (see Chapters 6 and 7, Volume 2).

Evidence of Remodeling

No evidence of remodeling was present in this structure.

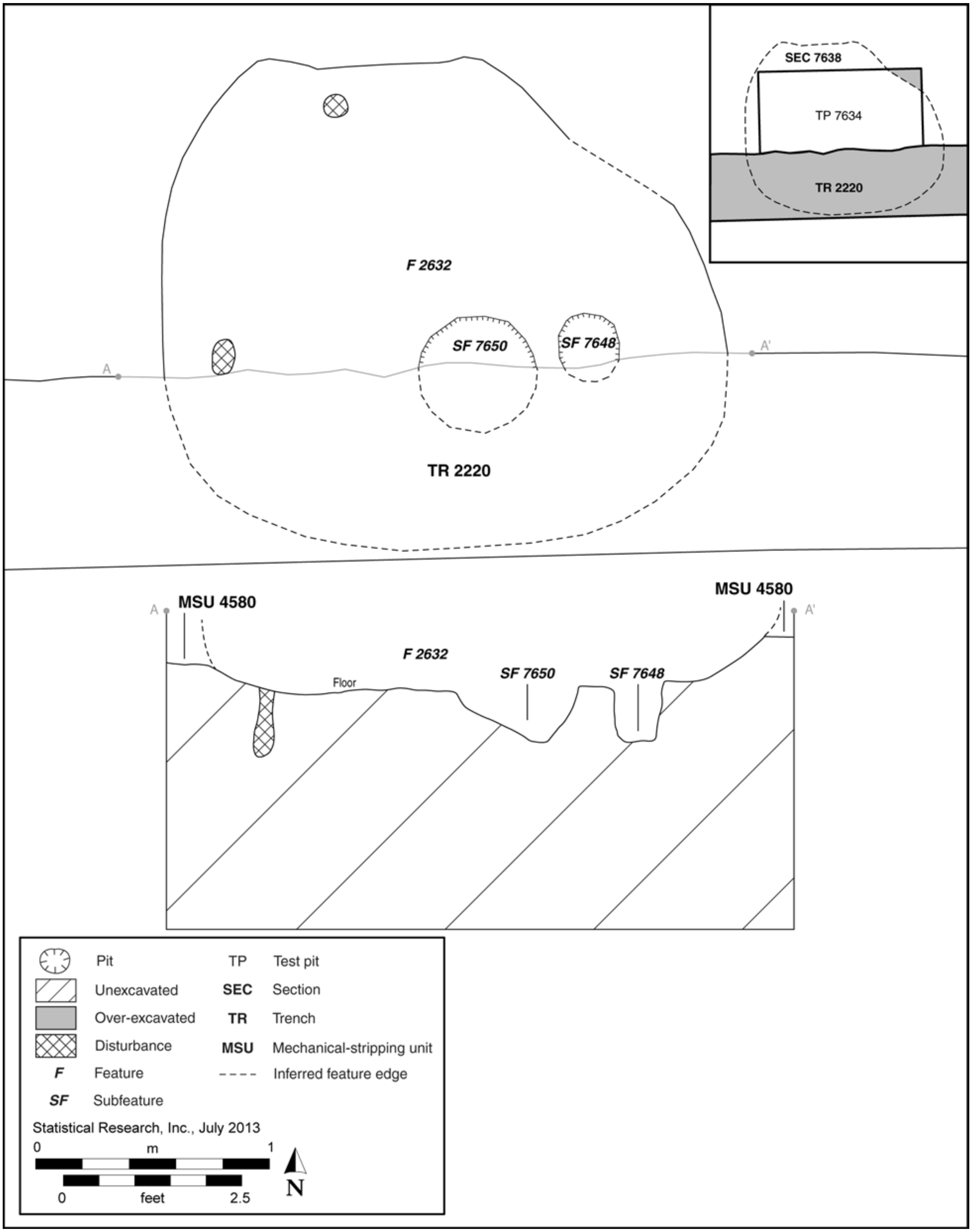

Figure 58. Post-excavation plan view and cross section of Feature 2632 (a structure) at Falcon Landing.

Figure 59. Photograph of the floor of Feature 2632 at Falcon Landing, view to the north.

Table 23. Intramural Features in Feature 2632 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
7648	circular	cylindrical	0.26	0.24	0.25	0.0156
7650	ovate	conical	0.51	0.20	0.23	0.0235

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 2632 was located at the surface of Unit IIA, with latest Holocene or Historical period alluvial-fan deposits (Unit V) overlying it. The unconformity between the Unit IIA surface and Unit V provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), corresponding to the Middle Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
The lack of charcoal and oxidation in the fill and on the structure floor indicates that the structure did not burn. Additionally, the presence of aeolian fill in the subfloor pits indicates that there may have been two phases of abandonment. The initial phase, evidenced by fill accumulation in the subfeatures, may have been

followed by a short period of reoccupation or reuse, after which the structure was abandoned and infilled by natural alluvial processes.

Stratigraphic Relationships and Associated Features
Feature 2632 originated on the surface of Unit IIA, which has a geochronologic date range that corresponds to the Middle Archaic to Protohistoric period. With such a long time span, the three nonthermal pits in the area had date ranges that overlap that of the structure (see Appendix A). Feature 4615 was dated to the Pioneer to Classic period, and Features 4619 and 4620 were in a stratigraphic position that corresponds to the Chiricahua phase.

Late Chiricahua Phase Component

Feature 1244

Structure type: house-in-pit
Age: late Chiricahua phase
Locus: Area B
Grid location: B5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 10.83
Effective floor area (m^2): 9.12
Orientation: east
Length (m): 4.50
Width (m): 4.10
Excavated depth (m): 0.16
Volume (m^3): 2.000

Excavation Methods
Feature 1244 was a late Chiricahua phase house-in-pit (see Table 10). The feature was originally identified during Phase 1 investigations in the profile of TR 1235, and the plan view was formally established during the Phase 2 mechanical stripping of MSU 1281 (see Appendix A). The feature was observed as an irregularly shaped stain containing charcoal, ash, and faunal bone, and a 1-by-2 m control unit (TP 5342) was manually excavated near the center of the stain. Four sections (SECs 5371, 5374, 5382, and 5616) were later established to remove structure fill surrounding the test pit. SECs 5371, 5374, and 5616 encompassed the area of the structure north of TR 1235, and SEC 5382 was used to remove the southern portion of the structure. SECs 5371 and 5374 were over-excavated; therefore, the structure edge was inferred in those units (Figure 60).

The control unit and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard surface. TP 5342 was excavated in three levels that represented one stratum. The first two levels were 0.10-m-deep arbitrary excavations, and the third ended at the structure floor. SECs 5382 and 5371 were excavated in two levels: one arbitrary level and one that ended at the structure floor. SECs 5374 and 5616 were excavated in a single level.

Feature Fill
A single stratum was present in Feature 1244. It was a brown silty loam containing ash, charcoal, and artifacts along with some intermixed alluvial or aeolian sand and gravel lamina, all of which decreased in density with depth. Artifacts were 15 pieces of faunal bone, 4 pieces of FAR, 57 pieces of flaked stone debitage, 2 indeterminate pieces of ground stone, 2 complete manos, 2 mano fragments, and 1 complete metate (see Table 10).

Construction Details

<u>Walls and Roof</u>

Feature 1244 was built in a pit that was at least 0.16 m in depth. The shape of the pit was likely ovate, but the eastern pit edge was largely inferred. Four postholes were observed along the walls in the western portion of the structure, although one of them (Subfeature 5808) was slightly inset from the wall. Two additional postholes were found in the northeastern portion of the structure and may represent the remnants of an entryway (Figure 61; Table 24; see Figure 60). One of the interior-wall postholes (Subfeature 5816) contained

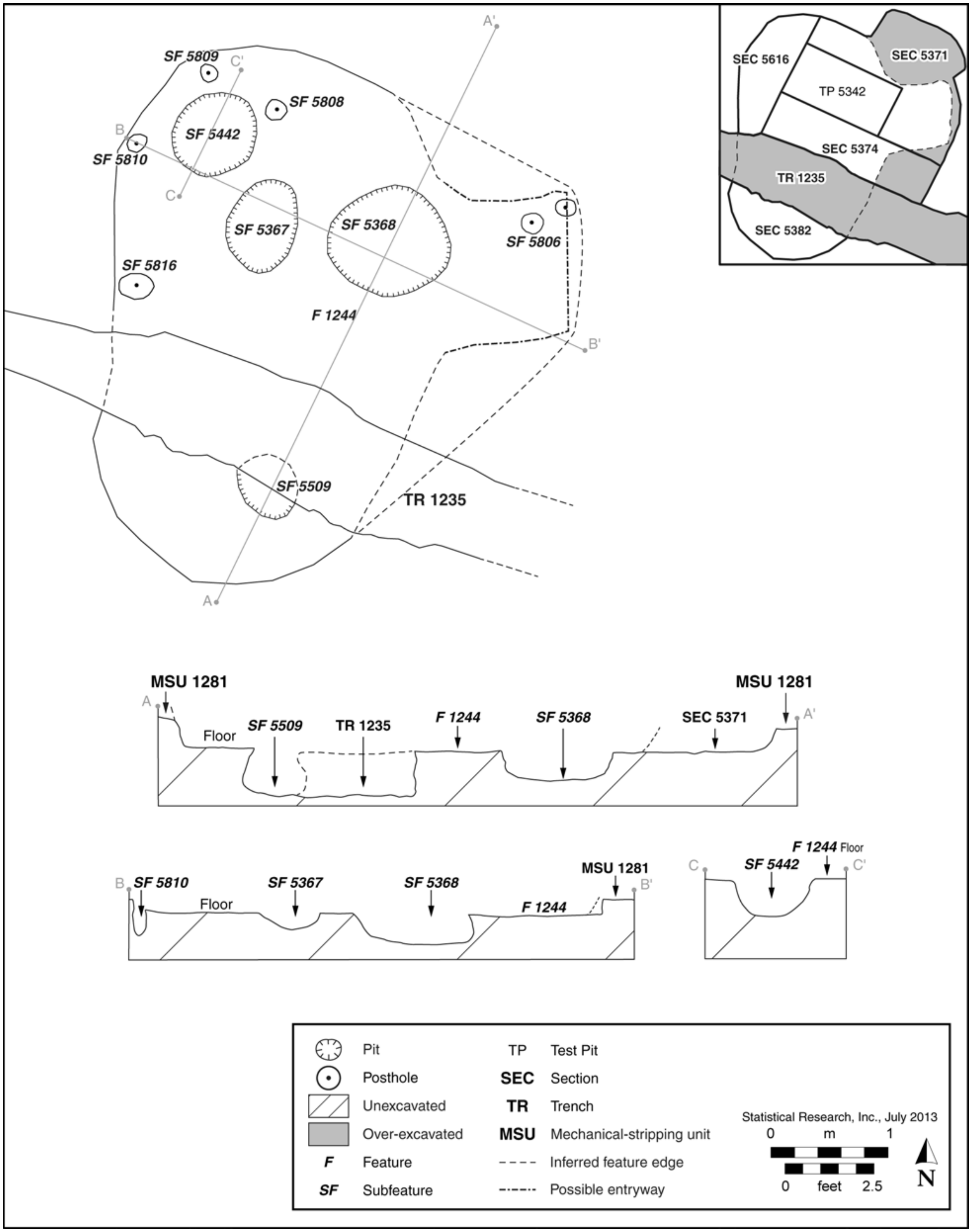

Figure 60. Post-excavation plan view and cross sections of Feature 1244 (a structure) at Falcon Landing.

Figure 61. Photograph of the floor of Feature 1244 at Falcon Landing, view to the north.

Table 24. Intramural Features in Feature 1244 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
5367	ovate	basin	0.71	0.60	0.20	0.0852
5368	circular	irregular	1.02	1.00	0.27	0.2754
5442	circular	basin	0.62	0.57	0.26	0.0919
Nonthermal pit (bell shaped)						
5509	indeterminate	bell	0.56	indeterminate	0.36	indeterminate
Posthole						
5806	circular	cylindrical	0.14	0.13	0.07	0.0013
5807	circular	cylindrical	0.14	0.12	0.17	0.0029
5808	circular	cylindrical	0.17	0.15	0.12	0.0031
5809	circular	cylindrical	0.14	0.13	0.14	0.0025
5810	circular	cylindrical	0.17	0.17	0.20	0.0058
5816	circular	cylindrical	0.27	0.22	0.63	0.0374

one piece of faunal bone and three pieces of flaked stone debitage. The postholes were all circular in plan view and cylindrical in cross section. All but one of the postholes ranged from 0.12 to 0.17 m in diameter and from 0.07 to 0.20 m in depth. One posthole (Subfeature 5816) was significantly larger than the other postholes and had a maximum diameter of 0.27 m and a depth of 0.63 m. It was located along the western wall of Feature 1244 and may have functioned as a main support for the structure.

Floor

The floor of the structure consisted of an unprepared earthen surface that was slightly compacted from use. No artifacts were found in contact with the floor.

Entry

No obvious entryway was noted during the excavation, but a pair of postholes in the eastern portion of the structure could possibly mark the position of a protruding entryway (see Figure 60).

Interior Features

Four intramural pits originated in the floor of Feature 1244 (see Table 24). Subfeature 5368 was located in front of the possible entryway, Subfeature 5367 was near the center of the structure, and Subfeatures 5442 and 5509 were located along the walls (see Figure 60). All intramural pits were excavated in one stratigraphic unit and level. A flotation sample was collected; the remaining fill was screened through 1/4-inch mesh. A pollen sample was scraped from pit bases.

Subfeature 5367 was a nonthermal pit that was basin shaped in cross section. The fill was a slightly compact brown silty loam with sparse charcoal flecks, one piece of flaked stone debitage, two pieces of unworked faunal bone, and one indeterminate ground stone fragment.

Subfeature 5368, a nonthermal pit, was filled with a loose grayish brown silty loam with an abundance of charcoal, ash, and some FAR (n = 2). Artifacts were five pieces of flaked stone debitage, one fragment of a hammerstone, and four mano fragments, some of which had been reused as fire stones. Despite indications of fire-related activity, in situ burning was not evident.

Subfeature 5442 was an unburned pit that was basin shaped in cross section and filled with a gray brown silty loam. Ash and charcoal were observed throughout, as well as some oxidized sediments. Despite the indications of fire-related activity, in situ burning was not evident, and it is more likely that this pit was infilled with trash during occupation of the structure. The artifacts recovered from the fill were one complete cobble uniface, four pieces of flaked stone debitage, and one indeterminate ground stone fragment.

Subfeature 5509, a large storage pit that was bell shaped in cross section, was infilled with a loose grayish brown silty loam. The pit fill had a moderate amount of charcoal throughout, but in situ burning was not evident. The artifacts collected from the pit were two pieces of flaked stone debitage and one piece of faunal bone. The previous excavation of TR 1235 removed the northern portion of this pit.

Evidence of Remodeling

Evidence of remodeling was limited to the presence of four intramural pits, which, if concurrent, would have left minimal usable internal space. It is probable that these pits were excavated in at least two phases during the life history of the structure. Further support for this interpretation was evidenced by an observed gravel lens at the interface between the structure floor and the uppermost pit fill of Subfeature 5442, which may indicate that natural processes had time to take effect in the structure as it sat vacant, before it was reoccupied at a later date.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 1244 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

During Phase 1 investigations, a piece of charred saltbush (*Atriplex* sp.) wood from Feature 1244 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 1390–1210 cal. B.C. (Aeon Sample No. 681). This date corresponds to the late Chiricahua phase of the Middle Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

It appears that sometime after abandonment, the structure was dismantled and was likely intended to be reoccupied. The former was evidenced by wind-borne and water-lain sediments in contact with the structure floor, and the latter was evidenced by a number of complete, de facto tools that were found in the structure fill. The paucity of charcoal indicates that the structure did not burn. Another possible scenario is that the feature was infilled with occupational debris after abandonment, and the de facto tools are actually refuse from other areas of the site.

Stratigraphic Relationships and Associated Features

The structure originated at the surface of Unit I, with Unit III2 deposits overlying it (see Appendix A). The geochronologic dates of this position correspond to the Early to Middle Archaic period. The radiocarbon results further refined the structure's date to the late Chiricahua phase.

The area around Feature 1244 had a fairly sparse arrangement of features. There were no neighboring structures. The nearest feature was a nonthermal pit, Feature 1425, immediately east of Feature 1244. It originated in the same unit and was potentially contemporaneous with the structure. Three pits to the south are also in that stratigraphic position: Features 1381, 1382, and 1492.

Feature 1498

Structure type: house-in-pit
Age: late Chiricahua phase
Locus: Area B
Grid location: B5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 3.71
Effective floor area (m^2): 3.50
Orientation: northeast
Length (m): 2.83
Width (m): 1.57
Excavated depth (m): 0.05
Volume (m^3): 0.340

Excavation Methods

Feature 1498 was a house-in-pit structure possibly dating to the late Chiricahua phase (see Table 10). The structure was discovered during the mechanical stripping of MSU 1281 (see Appendix A). It appeared as a large, ovate, organic stain that contained FAR. A 1-by-2-m control unit (TP 6528) was initially hand-excavated near the center of the structure. The remainder of the structure fill was then manually removed in two sections (SECs 6545 and 6547) (Figure 62).

Excavation of all the control units and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard surface. Because of shallow pit depth and lack of stratigraphy, all units were excavated in one level to the structure floor. An entryway, located in the northeastern portion of the structure, was excavated as part of SEC 6547.

Feature Fill

A single stratum was present within the structure. It was a brown sandy loam containing abundant FAR (uncollected). The structure fill appeared to have been from both occupational deposits and sporadic aeolian

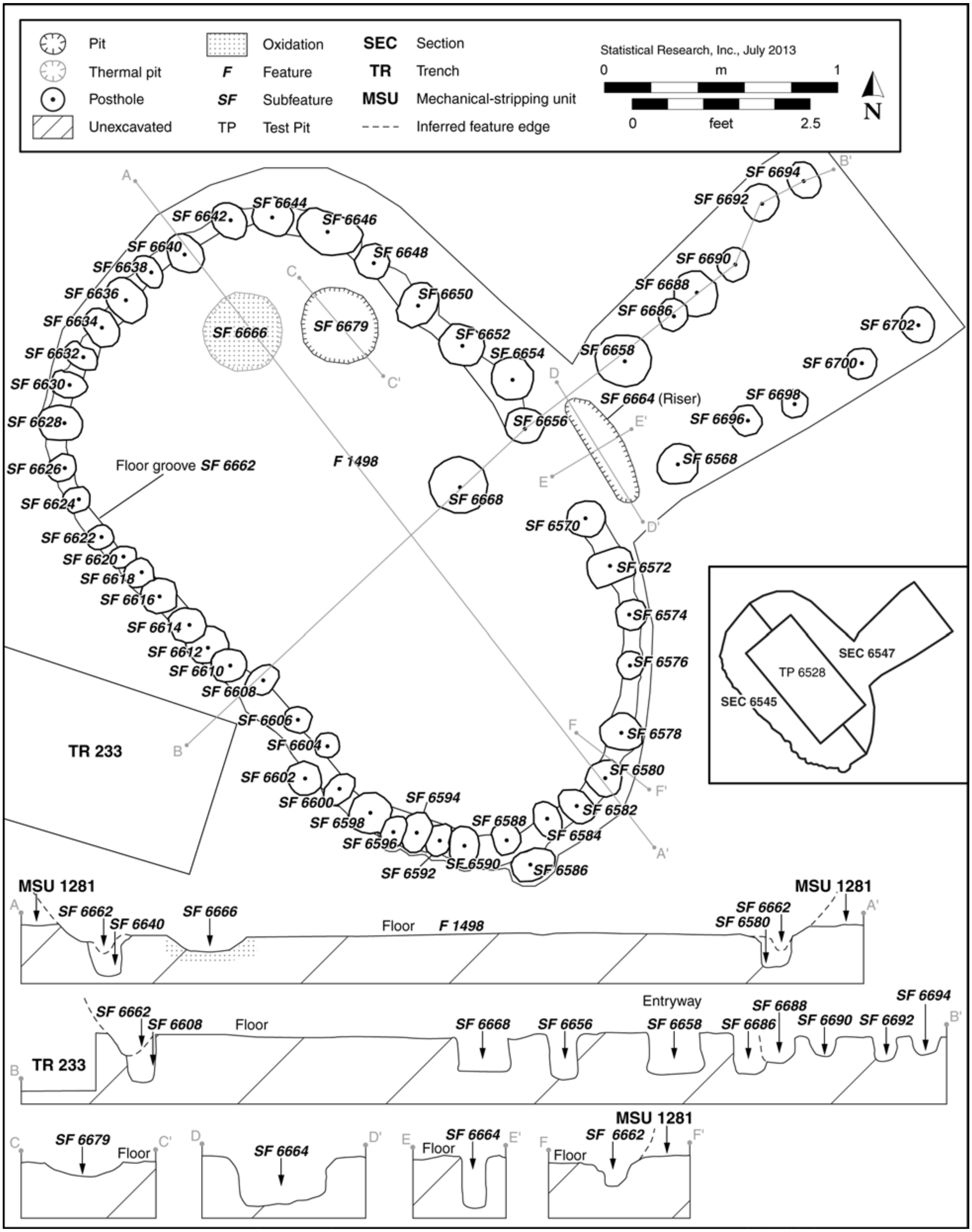

Figure 62. Post-excavation plan view and cross sections of Feature 1498 (a structure) at Falcon Landing.

processes; water-lain sediments occurred solely in areas of bioturbation. No architectural debris was identified in the fill. Twenty-one pieces of flaked stone debitage, 1 indeterminate ground stone fragment, 3 mano fragments, 1 metate fragment, 1 faunal bone, and 1 complete cobble uniface were recovered from the fill (see Table 10). Artifacts increased in frequency with proximity to the floor surface. No architectural debris was identified.

Construction Details

Walls and Roof

Feature 1498 was built in an ovate pit that was at least 0.05 m in depth (Figure 63). A series of 44 postholes was identified along the walls of the structure. These postholes were located within a floor groove (Subfeature 6662) immediately below the pit walls (Table 25). An additional 11 postholes were found lining a protruding entryway, and another central support posthole (Subfeature 6668) was identified in the center of the structure floor (see Figure 62). Subfeature 6668 contained one piece of flaked stone debitage. Nearly all the postholes were circular in plan view, with the exception of 8 that were ovate. In cross section, only 1 was conical, and the rest were cylindrical. Diameters ranged from 0.09 to 0.27 m, and depths ranged from 0.07 to 0.24 m (see Table 25). Little can be said about the walls and roof, because no architectural debris was preserved within the structure fill. The arrangement of the postholes and the presence of a protruding entryway is suggestive of a Hohokam-age structure. A single radiocarbon date from the structure, however, places it in the late Chiricahua phase, potentially at odds with the architectural style (see below).

Floor

The floor of the structure was unprepared and consisted of the natural substrate. It did, however, display noticeable use compaction. No artifacts, ash, oxidation, or charcoal staining was found in contact with the floor.

Figure 63. Photograph of the floor of Feature 1498 at Falcon Landing, view to the southwest.

Table 25. Intramural Features in Feature 1498 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Floor groove						
6662	irregular	cylindrical	7.23	0.13	0.09	0.0846
6664	ovate	cylindrical	0.46	0.13	0.22	0.0132
Thermal pit						
6666	circular	basin	0.32	0.32	0.06	0.0061
Nonthermal pit						
6679	circular	basin	0.34	0.33	0.06	0.0067
Posthole						
6568	circular	cylindrical	0.18	0.17	0.17	0.0052
6570	circular	cylindrical	0.15	0.14	0.19	0.0040
6572	rectangular or subrectangular	cylindrical	0.20	0.16	0.18	0.0058
6574	circular	cylindrical	0.13	0.11	0.18	0.0026
6576	circular	cylindrical	0.11	0.10	0.07	0.0008
6578	circular	cylindrical	0.19	0.17	0.17	0.0055
6580	circular	cylindrical	0.14	0.14	0.17	0.0033
6582	circular	cylindrical	0.16	0.13	0.14	0.0029
6584	circular	cylindrical	0.15	0.13	0.15	0.0029
6586	circular	cylindrical	0.17	0.14	0.11	0.0026
6588	circular	cylindrical	0.12	0.12	0.09	0.0013
6590	circular	cylindrical	0.17	0.15	0.12	0.0031
6592	ovate	cylindrical	0.16	0.12	0.12	0.0023
6594	circular	cylindrical	0.18	0.14	0.15	0.0038
6596	ovate	conical	0.16	0.10	0.18	0.0029
6598	circular	cylindrical	0.17	0.15	0.13	0.0033
6600	ovate	cylindrical	0.18	0.12	0.24	0.0052
6602	circular	cylindrical	0.16	0.15	0.12	0.0029
6604	circular	cylindrical	0.11	0.11	0.07	0.0008
6606	circular	cylindrical	0.13	0.13	0.11	0.0019
6608	circular	cylindrical	0.15	0.13	0.19	0.0037
6610	circular	cylindrical	0.16	0.15	0.18	0.0043
6612	circular	cylindrical	0.17	0.14	0.12	0.0029
6614	circular	cylindrical	0.17	0.16	0.18	0.0049
6616	circular	cylindrical	0.17	0.16	0.17	0.0046
6618	circular	cylindrical	0.13	0.13	0.16	0.0027
6620	circular	cylindrical	0.11	0.09	0.15	0.0015
6622	circular	cylindrical	0.11	0.10	0.14	0.0015
6624	circular	cylindrical	0.11	0.11	0.11	0.0013
6626	circular	cylindrical	0.13	0.11	0.12	0.0017
6628	circular	cylindrical	0.18	0.16	0.17	0.0049
6630	ovate	cylindrical	0.16	0.12	0.10	0.0019
6632	ovate	cylindrical	0.16	0.10	0.13	0.0021
6634	ovate	cylindrical	0.17	0.13	0.20	0.0044
6636	circular	cylindrical	0.19	0.16	0.20	0.0061
6638	ovate	cylindrical	0.16	0.12	0.20	0.0038
6640	circular	cylindrical	0.17	0.16	0.18	0.0049
6642	circular	cylindrical	0.14	0.14	0.14	0.0027

continued on next page

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
6644	circular	cylindrical	0.15	0.15	0.15	0.0034
6646	ovate	cylindrical	0.27	0.18	0.17	0.0083
6648	circular	cylindrical	0.14	0.13	0.09	0.0016
6650	circular	cylindrical	0.18	0.15	0.19	0.0051
6652	circular	cylindrical	0.18	0.15	0.17	0.0046
6654	circular	cylindrical	0.18	0.17	0.20	0.0061
6656	circular	cylindrical	0.15	0.14	0.20	0.0042
6658	circular	cylindrical	0.24	0.23	0.19	0.0105
6668	circular	cylindrical	0.24	0.23	0.16	0.0088
6686	circular	cylindrical	0.14	0.13	0.16	0.0029
6688	circular	cylindrical	0.19	0.19	0.12	0.0043
6690	circular	cylindrical	0.14	0.14	0.13	0.0025
6692	circular	cylindrical	0.16	0.15	0.12	0.0029
6694	circular	cylindrical	0.14	0.14	0.09	0.0018
6696	circular	cylindrical	0.13	0.13	0.12	0.0020
6698	circular	cylindrical	0.13	0.13	0.11	0.0019
6700	circular	cylindrical	0.13	0.13	0.12	0.0020
6702	circular	cylindrical	0.15	0.15	0.09	0.0020

Entry

A long, protruding entryway opened to the northeast and formed a corridor flanked by 11 wall postholes. Ramping up and widening toward the opening, the entryway was placed slightly to the left of the center of the structure and appeared to be flush with the wall line. A small floor groove or riser pit (Subfeature 6664) was observed at the juncture of the entryway and the wall (see Figure 62; Table 25). This type of entryway is indicative of Hohokam-style architecture (see discussion below).

Interior Features

A thermal pit (Subfeature 6666) and one nonthermal pit (Subfeature 6679) originated on the structure floor (see Table 25). The thermal pit was located in the northwestern portion of the feature (see Figure 62). The fill was a loose, brown sandy loam similar in composition to the structure fill. A cluster of FAR was observed in the pit fill but was not collected. The paucity of charcoal and ash in the fill indicates that heated rocks may have been brought to temperature in an open fire elsewhere and then placed in the pit, or this feature may have been cleaned periodically. Small patches of oxidation were present at the base. The pit was circular in plan view and basin shaped in cross section and measured 0.32 m in diameter and 0.06 m in depth. Pollen and macrobotanical samples were obtained from this subfeature and submitted for further analyses (see Chapters 6 and 7, Volume 2).

Subfeature 6679 was located in the northern corner of the structure, adjacent to the wall line (see Figure 62). It was a shallow, basin-shaped feature infilled with the same loose brown sandy loam observed in Subfeature 6666 and the structure.

Evidence of Remodeling

Several postholes within the southern structure wall overlapped (see Figure 62). This may be a feature of the original construction, but it may also be the result of post replacement. Post replacement could indicate care and maintenance of the structure over more than one season.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 1498 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis
A piece of charred material from the thermal pit (Subfeature 6666) that was too small to identify at the level of species was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 1880–1690 B.C. (Aeon Sample No. 1444). The date corresponds to the late Chiricahua phase of the Middle Archaic period (see Chapter 2, Volume 2). Despite the late Chiricahua date, the architectural style of this structure suggests a later Hohokam-age construction. The geochronologic date further suggests the structure was constructed no later than the Cienega phase (ca. 720 cal B.C.). It is possible, however, that this structure was constructed during the Hohokam cultural sequence and that the charcoal used for the radiocarbon analysis was derived from intrusive material that was significantly older.

Abandonment Processes
The lack of artifacts in contact with the structure floor suggests that the structure had a planned abandonment. The lack of architectural debris and the homogeneity in structural and subfeature fill indicate that the structure may have been dismantled at the time of abandonment and infilled in a relatively short amount of time. Because of the small amount of charcoal in the structure fill and the absence of extensive oxidation and charcoal staining from the fill and the floor, it is evident that this structure did not burn. The texture, contents, and mottled nature of the structure fill and the presence of a number of artifacts suggest that the structure was filled intentionally with refuse, but the thermal pit was not cleaned after its last use, because FAR remained in the fill.

Stratigraphic Relationships and Associated Features
Feature 1498 originated at the surface of Unit I, the dates of which correspond to the Early to Late Archaic period. The radiocarbon results narrowed this temporal assignment to the late Chiricahua phase; however, the architectural style of Feature 1498 (discussed above) may indicate the charcoal used to obtain the late Chiricahua date is much older than the structure itself. No features were in direct contact with Feature 1498, but 12 features within a 10-m radius of Feature 1498 (Features 1313, 1315, 1337, 1338, 1376, 1377, 1406, 1407, 1495, 1496, 1499, and 6166) were also located in the same stratigraphic unit and may have been contemporaneous with the structure (see Appendix A). The nearest was an activity area, Feature 1337, about 1 m to the southwest. A house-in-pit, Feature 1313, located 10 m to the southwest, was occupied sometime during the Early to Late Archaic period. Nearby extramural features include Features 1315, 1338, 1376, 1377, 1406, 1407, 1495, 1496, 1499, and 6166. A single pit feature in the area, Feature 1315, was radiocarbon dated to the Early Cienega phase.

Feature 2642
Structure type: house-in-pit
Age: late Chiricahua phase
Locus: Area A
Grid location: K4
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m^2): 3.22
Effective floor area (m^2): 3.22
Orientation: indeterminate
Length (m): 3.21
Width (m): indeterminate
Excavated depth (m): 0.13
Volume (m^3): 0.690

Excavation Methods
Feature 2642 was a possible house-in-pit that dated to the Middle Archaic period (see Table 10). It was originally identified in the northern profile of TR 2221 (see Appendix A). The structure was uncovered during mechanical stripping of MSU 10881, and because TR 2221 had removed the southern portion of the feature, it appeared as a semicircular stain. A very small portion of the northern structure edge was also over-excavated in MSU 10881 (Figure 64). A 1-by-1-m control unit (TP 16628) was placed near the center of the stain. It was excavated in two arbitrary 10-cm levels. Levels 1 and 2 extended deeper than the structure floor, and FAR fragments were present within the sediments below the feature. After excavation of the test pit, the fill associated with the structure was visible in the profile of TP 16628. The structure fill was then excavated in two sections (SECs 16742 and 16745) (see Figure 64). Macrobotanical and pollen samples were submitted for further analysis. They were collected from Level 1 of the test pit, Level 1 of SEC 16745, and the floor of the structure (see Chapters 6 and 7, Volume 2).

Feature Fill
The feature fill consisted of a single stratum of gray-brown silty loam with no visible charcoal. Thirteen fragments of unworked faunal bone were the only artifacts recovered (see Table 10).

Construction Details

Walls and Roof
Feature 2642 was built either in or around a pit that was at least 0.18 m in depth (Figure 65). The pit was likely circular, but the southern part of the feature was removed by TR 2221; so, its shape is considered indeterminate. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor
The floor of the structure was an unprepared surface corresponding to the natural substrate. No artifacts were in contact with the structure floor.

Entry
No entryway was noted during the excavations.

Interior Features
Subfeature 16749 was a thermal pit in the southwestern corner of the structure (see Figure 64). Although approximately 80 percent of this subfeature was removed by the trench, it appeared to have been circular or ovate in shape. The pit walls were heavily oxidized, as was the fill, which consisted of a silt loam. No charcoal or other artifacts were present.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

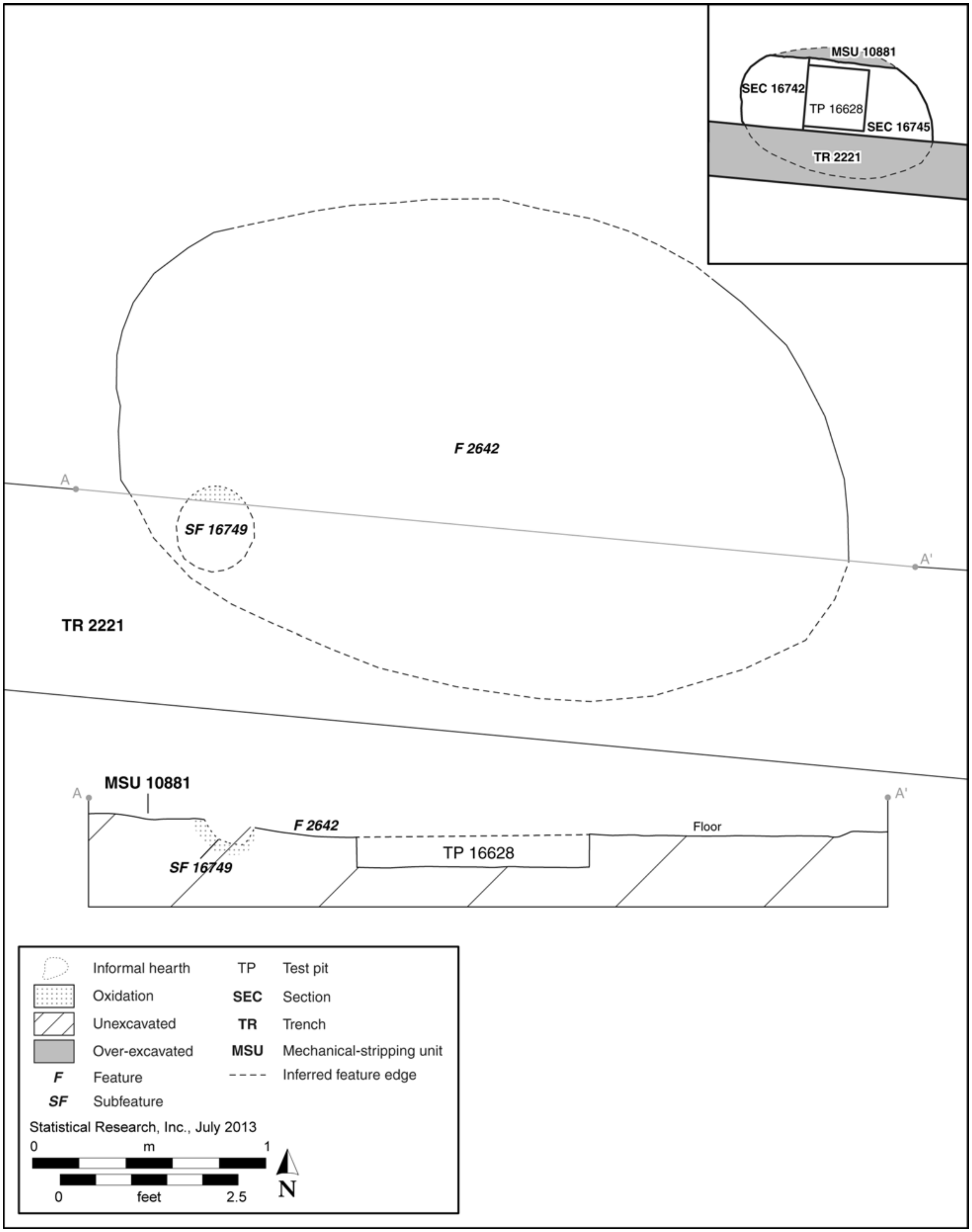

Figure 64. Post-excavation plan view and cross section of Feature 2642 (a structure) at Falcon Landing.

Figure 65. Photograph of the floor of Feature 2642 at Falcon Landing, view to the north.

Geochronologic Analysis

Feature 2642 was located at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit IIA surface and Unit IV provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A sample of charred mesquite (*Prosopis* sp.) wood from Level 1 of TP 16628 was submitted to Aeon for AMS dating and returned a 2σ calibrated date of 2200–2030 cal. B.C. (Aeon Sample No. 1445) (see Chapter 2, Volume 2). This date range corresponds with the Chiricahua phase of the Middle Archaic period.

Abandonment Processes

The single stratum of feature fill contained no charcoal or burned material that would indicate that the structure had burned. It likely filled with natural alluvial sediments from the surrounding site surface. Subfeature 16749, a thermal pit, contained oxidized fill that probably was left in place after its final use.

Stratigraphic Relationships and Associated Features

The geochronologic dates of the structure correspond to the Chiricahua phase of the Middle Archaic period. Features in the surrounding area of Feature 2642 are sparse, and none were located in the same stratigraphic unit as the structure (see Appendix A).

Feature 10114

Structure type: house-in-pit
Age: late Chiricahua phase
Locus: Area B
Total floor area (m^2): 1.15
Effective floor area (m^2): 1.12
Orientation: indeterminate

Grid location: F1
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Length (m): 1.90
Width (m): indeterminate
Excavated depth (m): 0.29
Volume (m³): 0.550

Excavation Methods

Feature 10114 was a possible house-in-pit that dated to the late Chiricahua phase (see Table 10). It was originally identified in the eastern profile of TR 10026 (see Appendix A) as a basin-shaped stratum of charcoal, ash-stained sediment, and FAR. The feature was not present in the western trench profile. During stripping of MSU 11160, the structure was encountered in plan view, and it became evident that TR 10026 had destroyed the western portion of the feature (Figure 66). Hand-excavation proceeded with a 1-by-2-m control unit (TP 12273) placed over most of the remaining feature. The test pit was excavated in five levels, and because of difficulty in defining the upper pit wall, the uppermost level of the control unit was over-excavated beyond the feature edges. The remaining, northern portion of the feature was removed in one section (SEC 12285). The section was excavated in a single level and was also partially over-excavated because of Feature 12287, a previously unidentified extramural pit (see Figure 66).

Feature Fill

A single stratum of brown silt loam was present in the structure. The only change in composition of the fill was a decrease in artifact density above the floor. The fill contained dispersed charcoal fragments, ash, and oxidized sediment as well as 17 pieces of flaked stone debitage, 1 complete mano, 2 indeterminate ground stone fragments, 10 pieces of FAR, and 6 faunal-bone specimens (see Table 10). The fill had a minor amount of plant and insect disturbance throughout. A pollen sample was scraped from the floor and submitted for further analysis (see Chapter 7, Volume 2).

Construction Details

Walls and Roof

Feature 10114 was built in or around a 0.29-m-deep pit. The shape of the pit was likely ovate, but the western portion was truncated by TR 10026. No postholes were identified (Figure 67). Little can be said about the structure walls and roof, because no architectural debris was preserved within the structure fill. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

No formally prepared floor was found within this structure, and the base of the structure consists merely of natural sediments. The floor was also identified by the presence of a subfeature. No artifacts were in contact with the floor.

Entry

No entryway was noted during the excavations.

Interior Features

A single intramural nonthermal pit, Subfeature 12282, originated at the floor in the southern portion of the structure. It was circular in plan view, but about half the pit was removed by TR 10026 (see Figure 66). The remaining part of the pit was 0.28 m. In cross section, the pit was conical and 0.10 m in depth. It held a brown silt loam with sparse charcoal flecking, similar to the structure fill.

Evidence of Remodeling

No obvious evidence of remodeling was observed.

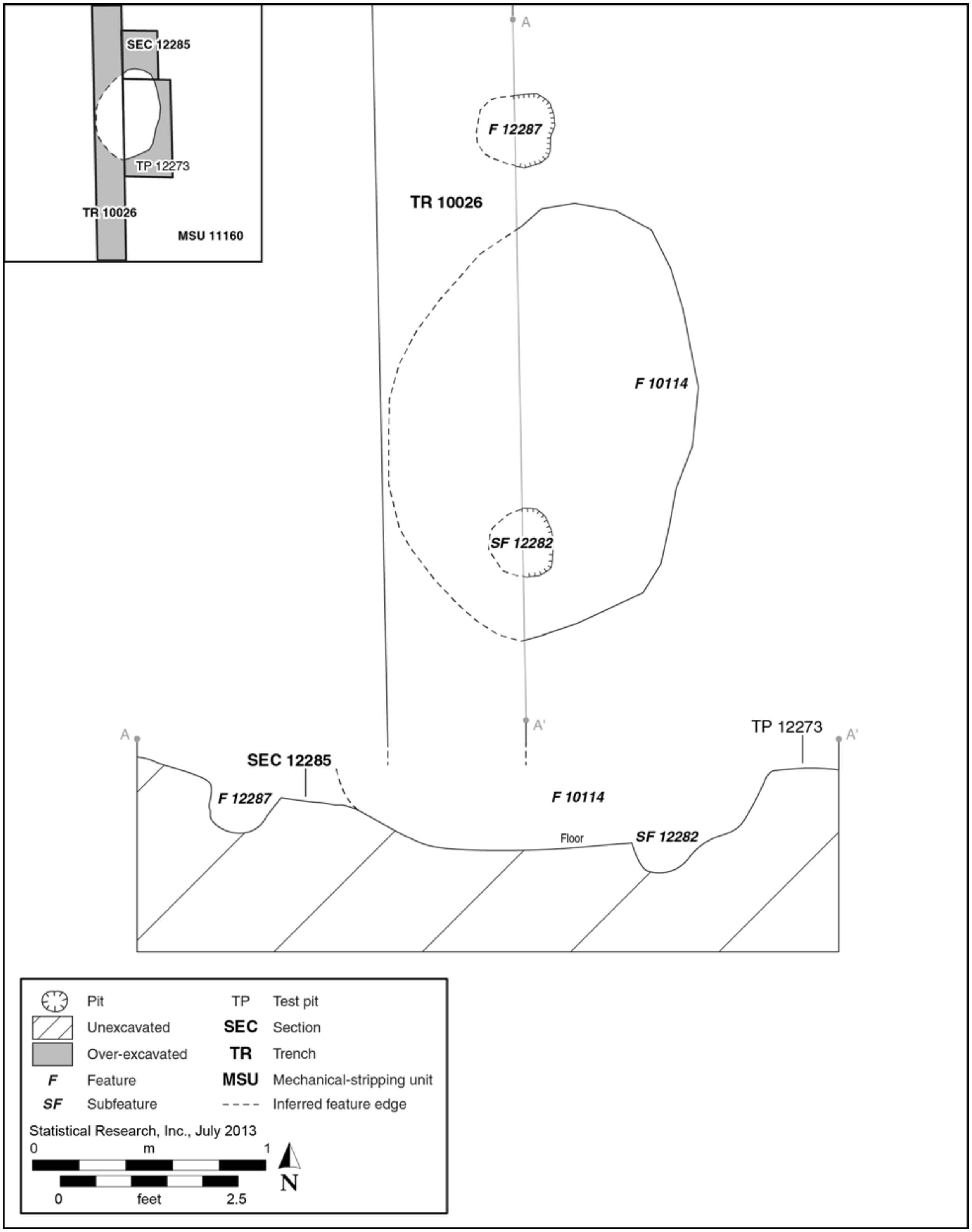

Figure 66. Post-excavation plan view and cross section of Features 10114 (a structure) and 12287 (an adjacent pit) at Falcon Landing.

Figure 67. Photograph of the floor of Feature 10114 at Falcon Landing, view to the north–northeast.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 10114 originated at or near the surface of Unit II, with latest Holocene alluvial-fan deposits (Unit V) overlying it. The unconformity between the surface of Unit II and Unit V provides a geochronologic date range of ca. 2730 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A burned mesquite (*Prosopis* sp.) seed from just above the floor of the structure (Level 5 of TP 12273) was submitted to Aeon for AMS analysis. The charcoal returned a 2σ calibrated date of 1380–1210 cal. B.C. (Aeon Sample No. 1441) (see Chapter 2, Volume 2), corresponding to the late Chiricahua phase of the Middle Archaic period.

Abandonment Processes

The floor had no charcoal staining or oxidation to indicate that the structure had burned. The 5–10 cm of fill above the floor contained few artifacts and may have been naturally deposited alluvial and aeolian sediments. The sediment above that contained a much higher quantity of artifacts that may represent intentionally deposited refuse from the occupants of the site.

Stratigraphic Relationships and Associated Features

Structure Feature 10114 had a stratigraphic location that provided a long date range spanning the Middle Archaic to Protohistoric period, which was further refined by the radiocarbon date to place the feature in the late Chiricahua phase. In the immediate area of Feature 10114 were a large number of features (see Appendix A). Most of the extramural features were in the same stratigraphic location as Feature 10114 and may be contemporaneous. These included 30 nonthermal pits (Features 11244, 11264, 11265, 11268, 11271, 11272, 11273, 11274, 11275, 11277, 11287, 11289, 11293, 11294, 11295, 11299, 11304, 11305, 11315, 11317, 11318, 11320, 11321, 11331, 11335, 11336, 11337, 12268, 12269, and 12287), 8 thermal pits (Features 11266, 11270, 11276, 11292, 11316, 11333, 11334, and 12294), a charcoal/ash lens (Feature 11300) and an FAR concentration (Feature 11319). One nonthermal pit, Feature 12287, was immediately north of the structure and originated in Unit II during the Chiricahua phase.

Feature 11229

Structure type: house-in-pit
Age: late Chiricahua phase
Locus: Area B
Grid location: F1
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 5.64
Effective floor area (m^2): 5.64
Orientation: indeterminate
Length (m): 3.02
Width (m): 2.65
Excavated depth (m): 0.09
Volume (m^3): 0.540

Excavation Methods

Feature 11229 was a possible house-in-pit that dated to the late Chiricahua phase (see Table 10). The structure was identified during mechanical excavation of MSU 11160 (see Appendix A). Upon identification, it appeared as a large, ovate, organic stain containing dispersed charcoal flecking and FAR. A 1-by-1-m control unit (TP 11810) was first hand-excavated near the center of the stain. The remaining structure fill was then manually removed in two sections (SECs 12253 and 12257) (Figure 68).

The control unit and sections ended at the structure floor, which consisted of a slightly lighter, relatively compact, continuous, and hard earthen surface. The control unit was excavated in two levels; Level 1 was excavated as an arbitrary level through the structure fill, and Level 2 was excavated through floor fill and ended at the structure floor. Because of shallow depth, both sections were excavated in one level, to the structure floor. A flotation sample and a pollen sample were scraped from the floor surface.

Feature Fill

A single stratum was present within the fill of Feature 11229. It consisted of a yellowish brown sandy clay loam containing a sparse quantity of dispersed charcoal flecking. The fill displayed laminated sediments consistent with aeolian and alluvial deposition. Extensive root and insect bioturbation was present throughout. Four pieces of flaked stone debitage and one metate fragment were present in the structure fill (see Table 10). Charcoal obtained from the floor fill (SEC 12557, Level 1) was submitted for further analysis (see Chapter 6, Volume 2).

Construction Details

Walls and Roof

Feature 11229 was built either in or around a 0.09-m-deep ovate pit (Figure 69). Whether the structure was in or surrounding the pit was impossible to interpret, because no postholes were identified. Additionally, architectural debris was not present within the structure fill, and coupled with the lack of postholes, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The floor of the structure consisted of the natural substrate, which displayed noticeable use compaction; oxidization and staining were not present. A mano fragment and piece of flaked stone debitage were found

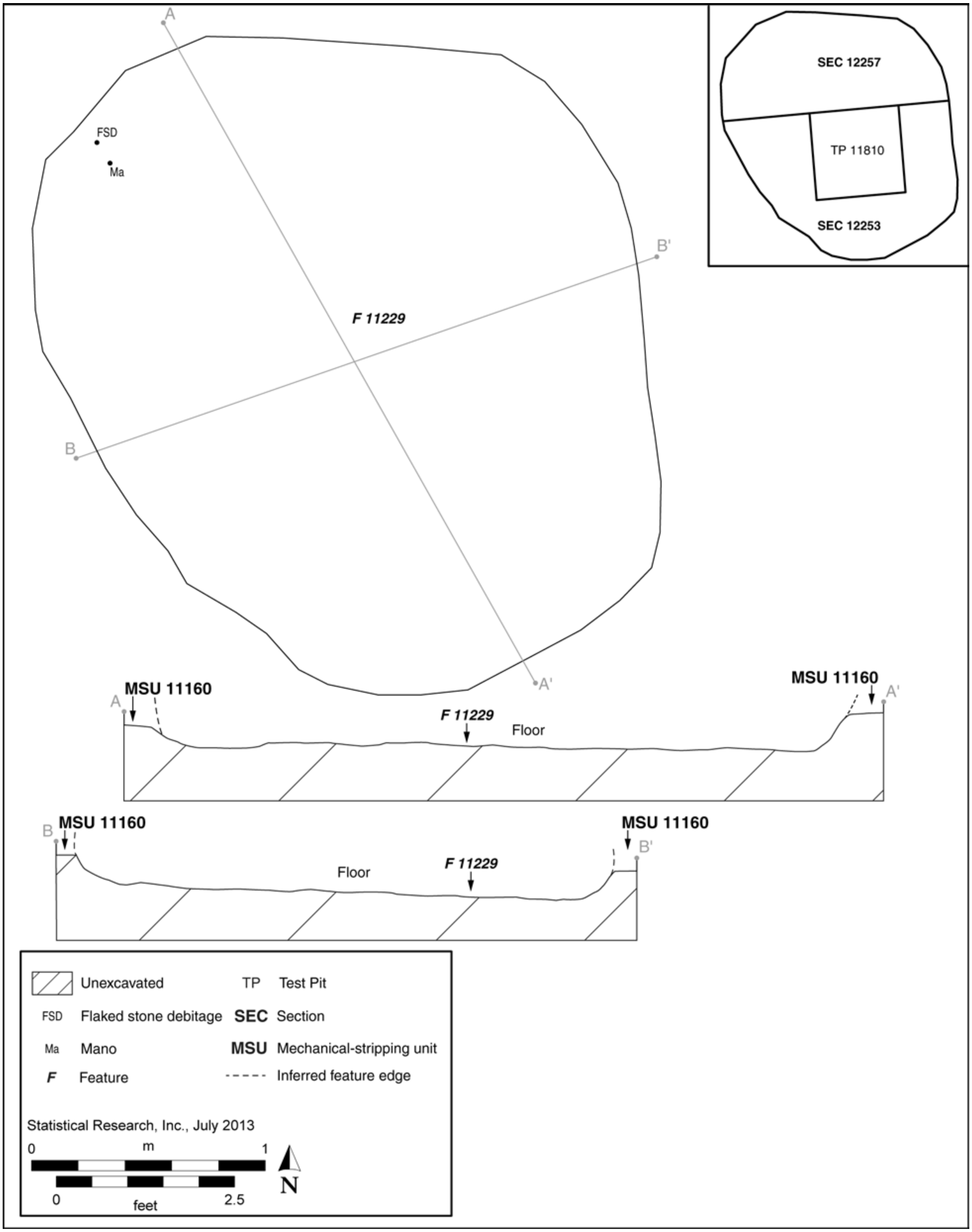

Figure 68. Post-excavation plan view and cross sections of Feature 11229 (a structure) at Falcon Landing.

Figure 69. Photograph of the floor of Feature 11229 at Falcon Landing, view to the north–northeast.

Table 26. Point-Located Floor Artifacts in Feature 11229 at Falcon Landing

PD No.	Stratum	Artifact Class	Artifact Type	Count
12260	floor	lithic	mano	1
12261	floor	lithic	flaked stone debitage	1

on the floor and point-located (Table 26; see Figure 68). A pollen sample from the floor was also sent for further analysis (see Chapter 7, Volume 2).

Entry
Evidence of an entryway was not identified.

Interior Features
No interior features were identified.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis

Feature 11229 was located at the surface of Unit II, with latest Holocene alluvial-fan deposits (Unit V) overlying it. The unconformity between the surface of Unit II and Unit V provides a geochronologic date range of ca. 2730 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A fragment of mesquite (*Prosopis* sp.) charcoal recovered from the floor fill (Level 1, SEC 12257) was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 1380–1210 cal. B.C. (Aeon Sample No. 1440) (see Chapter 2, Volume 2). This date range places the use of the structure in the late Chiricahua phase of the Middle Archaic period.

Abandonment Processes

The structure fill possessed no evidence of structural debris, and wind-borne and water-lain deposits in contact with the floor suggest that the structure was dismantled upon abandonment. The relatively small amount of charcoal and the lack of burned architectural debris in the structure fill, as well as no oxidation or charcoal staining on the floor, indicate that the structure did not burn. After abandonment, it appeared that the structure filled with natural alluvial and aeolian sediments; however, the presence of a few artifacts in the structure fill suggests some intentional trash deposition.

Stratigraphic Relationships and Associated Features

Feature 11229 originated at the surface of Unit II, with a geochronologic date range corresponding to the Middle Archaic to Protohistoric period. The radiocarbon date narrowed the age of the structure to the late Chiricahua phase. A moderate density of features existed within a 10-m radius of Feature 11229 (see Appendix A). A nearby structure (Feature 11181) was radiocarbon dated to the San Pedro phase and was therefore slightly younger than Feature 11229. A nonthermal pit in the area (Feature 11217) dated to the Chiricahua phase, therefore predating the use of Feature 11229. The remaining extramural features in proximity to Feature 11229 were in the same stratigraphic unit, having a wide potential date range of the Middle Archaic to Protohistoric period. These included Features 11195, 11196, 11207, 11211, 11218, and 11222.

San Pedro Phase Component

Feature 2627

Structure type: house-in-pit
Age: San Pedro phase
Locus: Area A
Grid location: J4
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m^2): 2.63
Effective floor area (m^2): 2.44
Orientation: indeterminate
Length (m): 2.74
Width (m): indeterminate
Excavated depth (m): 0.15
Volume (m^3): indeterminate

Excavation Methods

Feature 2627 was a San Pedro phase house-in-pit (see Table 10). The structure was identified during Phase 1 investigations in the northern profile of TR 2219 and was further defined by the mechanical stripping of MSU 4580 (see Appendix A). In plan view, the structure appeared as a semicircular, organic stain that contained charcoal and FAR. The southern portion of the structure had been removed by the excavation of TR 2219, and the eastern edge of the feature had been slightly truncated by an adjacent structure, Feature 2628 (Figure 70). A 1-by-2-m control unit (TP 6939) was first hand-excavated in the northern portion of the stain, but upon identifying the structure floor, it was noted that the control unit was over-excavated beyond the structure edge. The remainder of structure fill was manually removed in one section (see Figure 70).

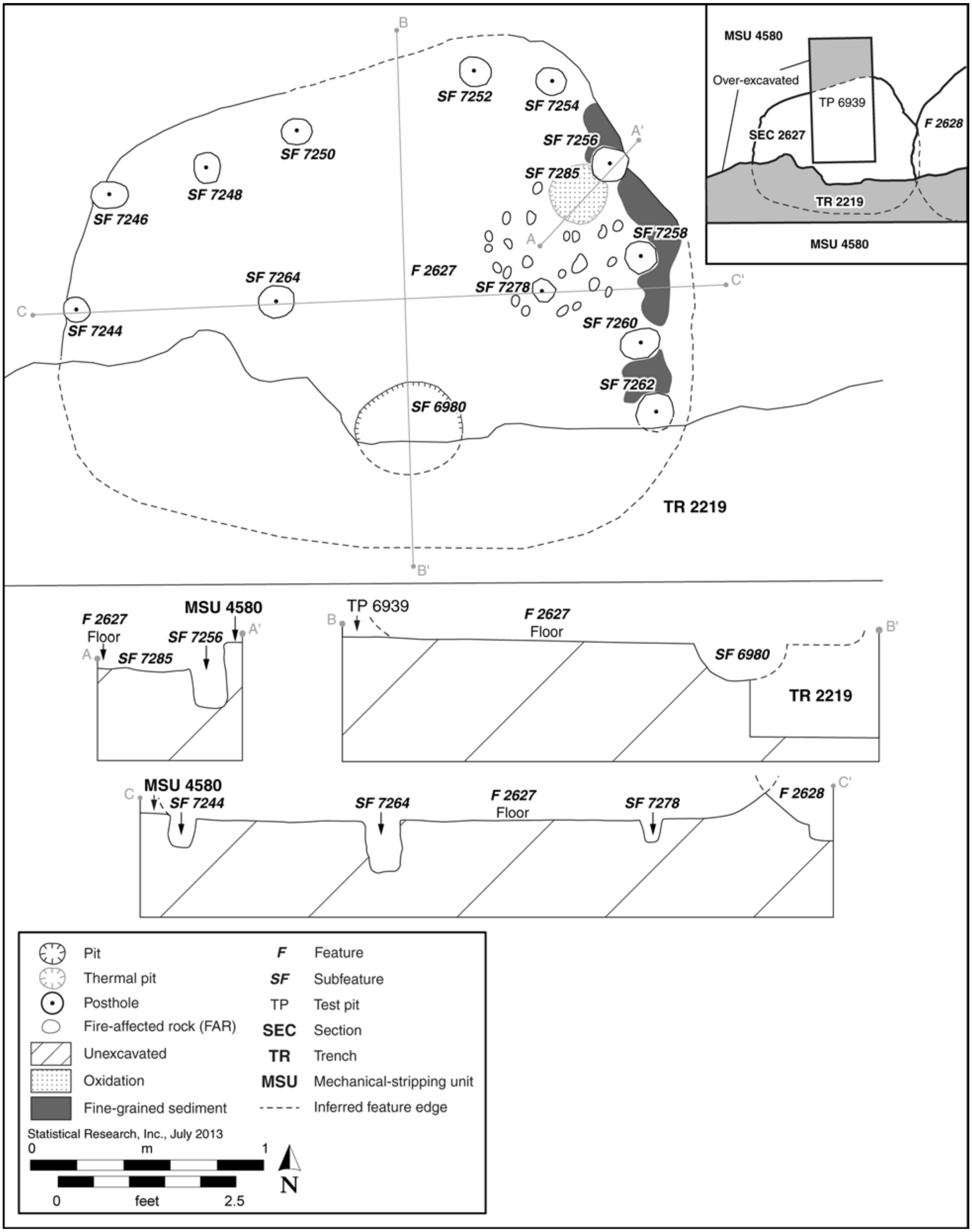

Figure 70. Post-excavation plan view and cross sections of Feature 2627 (a structure) at Falcon Landing.

Excavation of all the control units and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard surface. Excavation of Level 1 of TP 6939 and the remainder of the structure fill was ended arbitrarily. Level 2 of both units ended at the structure floor.

Feature Fill

One stratum was present in Feature 2627. The fill was a soft, yellowish brown sandy loam containing some large sand and gravel inclusions. These gravels, located near the base of the structure, likely indicate natural postabandonment infilling by alluvial processes. In the southern and eastern portions of the structure, the fill near the floor suggests that in situ burning or secondary dumping occurred. A small, contained area of FAR (n = 5), charcoal, ash, and oxidized sediments were observed there (see Table 10). Because of their small quantity and confined nature, the burned materials were not likely burned architectural debris. Artifacts collected from the fill were noted to decrease with depth and included 6 pieces of flaked stone debitage, eight pieces of FAR, one faunal bone, one hammerstone, one hammerstone fragment, two indeterminate ground stone fragments, one metate, and one mano fragment. A macrobotanical sample was obtained from the structure fill and submitted for species identification (see Chapter 6, Volume 2).

Construction Details

Walls and Roof

Feature 2627 was built in a 0.15-m-deep pit (Figure 71). The pit was likely circular, but it had been truncated by TR 2219. Ten wall postholes were identified and excavated within the pit walls. Two additional postholes found in the floor may represent part of a central support-post arrangement that might have braced the roof (Table 27; see Figure 70). All of the postholes were circular in plan view. Seven were cylindrical in cross section, and 5 were conical. The posts ranged from 0.10 to 0.16 m in diameter, and they were set 0.09–0.26 m below the floor surface. Brush or grass would have been used to further construct the walls formed by these posts.

Figure 71. Photograph of the floor of Feature 2627 at Falcon Landing, view to the south.

Table 27. Intramural Features in Feature 2627 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Thermal pit						
7285	circular	basin	0.24	0.23	0.03	0.0017
Nonthermal pit						
6980	indeterminate	basin	0.46	indeterminate	0.14	indeterminate
Posthole						
7244	circular	cylindrical	0.12	0.11	0.15	0.0020
7246	circular	conical	0.16	0.13	0.10	0.0021
7248	circular	cylindrical	0.13	0.12	0.14	0.0022
7250	circular	cylindrical	0.13	0.13	0.21	0.0035
7252	circular	conical	0.14	0.13	0.12	0.0022
7254	circular	cylindrical	0.12	0.12	0.14	0.0020
7256	circular	cylindrical	0.16	0.16	0.26	0.0067
7258	circular	conical	0.15	0.14	0.22	0.0046
7260	circular	conical	0.16	0.14	0.21	0.0047
7262	circular	conical	0.16	0.16	0.14	0.0036
7264	circular	cylindrical	0.15	0.15	0.20	0.0045
7278	circular	cylindrical	0.11	0.10	0.09	0.0010

Located along the eastern edge of the structure was an area of fine-grained sediments, or mud, surrounding the postholes (see Figure 70). These fine-grained sediments may indicate reconstruction or reinforcement of the walls. Further evidence of this wall reinforcement is present in a neighboring structure (Feature 2628) which partially overlaps the eastern wall of Feature 2627. The adjacent wall of Feature 2628 has a double row of posts that indicates some level of remodeling or strengthening of that wall. It is possible that the forces requiring the western wall of Feature 2628 to be remodeled also affected the eastern wall of Feature 2627. Features 2627 and 2628 were determined to be contemporaneous through radiocarbon analysis (see below).

Floor

The floor of Feature 2627 was unprepared and consisted of the natural substrate. It did, however, display noticeable use compaction, and sporadic patches of ash were observed over the surface. The ash was likely the result of intramural pit cleanout. No artifacts were in contact with the floor.

Entry

Evidence of an entry was not identified but may have been located in the portion of the structure destroyed by TR 2219 (see Figure 70).

Interior Features

Two intramural pits (Subfeatures 6980 and 7285) originated at the structure floor (see Figure 70; Table 27). Subfeature 6980, a nonthermal pit, was located near the center of the structure and was truncated by TR 2219. It was basin shaped in cross section and contained a single stratum of light yellowish brown sandy loam. Charcoal, ash, two FAR fragments, and three indeterminate ground stone fragments were components of the fill.

Subfeature 7285 was a thermal pit located near the northeastern wall of the structure. It was basin shaped in cross section and circular in plan view. It measured 0.24 m long by 0.23 m wide and 0.03 m in depth. The fill was a very dark grayish brown sandy loam containing ash and charcoal, and the pit exhibited an oxidized rind along its walls. This shallow thermal pit was surrounded by a localized dump of FAR that may represent cleanout from the last use of the feature.

Evidence of Remodeling

This feature was likely not remodeled. The single circle of postholes and minimally used thermal pit suggest that this feature was utilized during a single phase of time.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 2627 was located at the surface of Unit IIs/sf, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit IIs/sf surface and Unit IV provides a geochronologic date of ca. 790 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis
A piece of burned mesquite (*Prosopis* sp.) wood from the fill of Feature 2627 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 840–800 cal. B.C. (Aeon Sample No. 740). The date corresponds to the San Pedro phase of the Late Archaic period (see Chapter 2, Volume 2).

Abandonment Processes
The structure did not appear to have burned at the time of abandonment or afterward. Although a small amount of charcoal and ash were observed in contact with the floor, it is probable that this refuse resulted from rake-out of a thermal pit or the secondary dumping of refuse to infill the structure. The fill just above the floor surface was a homogeneous stratum that appeared to be the result of natural aeolian or alluvial activity that occurred while the structure sat vacant.

Stratigraphic Relationships and Associated Features
Feature 2627 originated at the surface of Unit IIs/sf, overlain by Unit IV (see Appendix A). The geochronologic date range for this position corresponds to the Late Archaic to Pioneer period. The radiocarbon results further refined that date to the San Pedro phase. A neighboring San Pedro phase structure to the east, Feature 2628, intruded slightly on Feature 2627 (see Figure 70). Another contemporaneous house-in-pit, Feature 2629, was located 7.5 m to the east. Nearby extramural features in the same stratigraphic position included Features 10907, 10908, and 10933. Features 4606 and 4607 were north and northwest of Feature 2627. Stratigraphically, they were located on the surface of Unit IIA but were overlain by Unit IV. As a result, they had a date range corresponding to the Middle Archaic to Protohistoric period. Just to the south of Feature 2627 were two later pits, Features 10905 and 10906, which originated in Unit IV, indicating that they dated to the Pioneer to Classic period.

Feature 2628
Structure type: house-in-pit
Age: San Pedro phase
Locus: Area A
Grid location: J4
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m^2): 3.94
Effective floor area (m^2): 3.23
Orientation: northeast
Length (m): 2.83
Width (m): indeterminate
Excavated depth (m): 0.14
Volume (m^3): 0.950

Excavation Methods
Feature 2628 was a San Pedro phase house-in-pit (see Table 10). The structure was identified during Phase 1 investigations in the northern profile of TR 2219 and was further defined by the mechanical stripping of MSU 4580 (see Appendix A). The southern portion had been removed by the excavation of TR 2219, making the feature appear in plan view as a semicircular, organic stain that contained charcoal, FAR, and cobbles. A 1-by-2 m control unit (TP 6941) was first hand-excavated near the center of the stain (Figure 72). Upon reaching the floor, it was noted that a small portion of the test pit had over-excavated the pit beyond its northern edge.

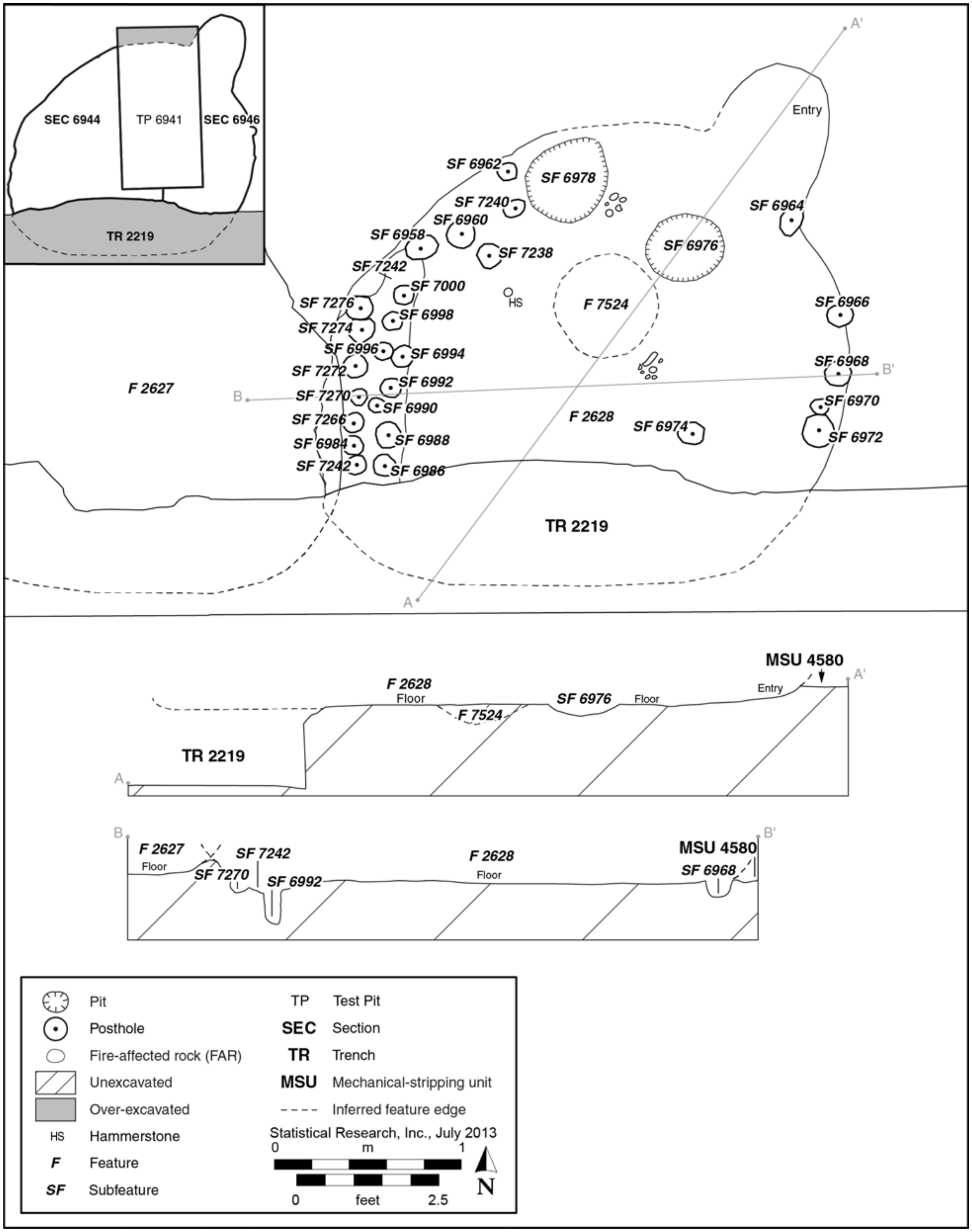

Figure 72. Post-excavation plan view and cross sections of Features 2627 and 2628 (structures) and Feature 7524 (an underlying pit) at Falcon Landing.

The remainder of the structure then was removed in two sections; SECs 6944 and 6946 (see Figure 72). Excavation of the control unit and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. Because of the shallow depth of fill, all units were excavated to the floor in a single level.

Feature Fill

A single stratum was present in Feature 2628, which was a slightly compacted yellowish brown sandy loam containing gravels. These gravels indicated that alluvial activity related to postabandonment depositional processes may have occurred. No evidence of in situ burning was observed within the fill; however, two discreet FAR concentrations were observed in contact with the floor surface. These were uncovered during excavation of the control unit (TP 6941).

Artifact density decreased with depth. Nine pieces of FAR were collected, along with eight pieces of flaked stone debitage, one hammerstone fragment, one indeterminate ground stone fragment, one mano fragment, and five pieces of faunal bone (see Table 10). In addition, a macrobotanical sample obtained from the structure fill was submitted for further analysis (see Chapter 6, Volume 2).

Construction Details

<u>Walls and Roof</u>

Feature 2628 was built in a 0.14-m-deep pit that was likely circular in plan view (Figure 73). Wall postholes were placed within an internal floor groove (Subfeature 7242) in the western portion of the structure, near where the feature overlapped Feature 2627 (see Figure 72). The floor groove contained a double row of postholes that possibly represent remodeling or strengthening of the wall. In the eastern part of the structure, the wall postholes were set flush with the pit wall. In total, 22 postholes lined the pit edge and were interpreted as wall postholes, and 4 originated in the pit floor (Subfeatures 6960, 6974, 7238, and 7240) and were possibly associated with roof support or with other intramural subfeatures (see Figure 72). In plan

Figure 73. Photograph of the floor of Feature 2628 at Falcon Landing, view to the south.

view, 24 of the postholes were circular, and 2 were ovate. In cross section, 14 were conical, and 12 were cylindrical (Table 28). The postholes ranged from 0.08 to 0.19 m in diameter and from 0.04 to 0.24 m in depth. Several postholes contained artifacts, including one piece of lithic debitage in Subfeature 6958, two in Subfeature 6960, and one in Subfeature 6968. Little more can be said about the walls and roof, because no architectural debris was found in the structure fill.

Floor

The floor of Feature 2628 was unprepared and consisted of the natural substrate. It did, however, display noticeable use compaction, and it was ash stained. Two areas of FAR were concentrated on the floor, one near Subfeature 6978 and another just east of the center of the structure (see Figure 72). A hammerstone was point-located on the floor in the west-central portion of the structure. It is likely that the presence of

Table 28. Intramural Features in Feature 2628 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Floor groove						
7242	irregular	irregular	1.35	0.53	0.13	0.0930
Nonthermal pit						
6976	circular	basin	0.60	0.55	0.17	0.0561
6978	circular	basin	0.53	0.42	0.11	0.0245
Posthole						
6958	ovate	conical	0.18	0.13	0.18	0.0042
6960	circular	conical	0.16	0.15	0.19	0.0046
6962	circular	cylindrical	0.11	0.10	0.18	0.0020
6964	circular	conical	0.15	0.12	0.14	0.0025
6966	circular	cylindrical	0.14	0.13	0.09	0.0016
6968	circular	conical	0.16	0.15	0.12	0.0029
6970	circular	conical	0.10	0.10	0.09	0.0009
6972	circular	conical	0.19	0.17	0.09	0.0029
6974	circular	conical	0.14	0.14	0.14	0.0027
6984	circular	cylindrical	0.11	0.11	0.20	0.0024
6986	circular	cylindrical	0.13	0.13	0.13	0.0022
6988	circular	cylindrical	0.15	0.15	0.22	0.0050
6990	circular	conical	0.09	0.08	0.08	0.0006
6992	circular	conical	0.12	0.11	0.17	0.0022
6994	circular	cylindrical	0.13	0.13	0.24	0.0041
6996	circular	conical	0.09	0.09	0.07	0.0006
6998	circular	cylindrical	0.11	0.11	0.12	0.0015
7000	circular	conical	0.10	0.10	0.10	0.0010
7238	circular	conical	0.14	0.14	0.15	0.0029
7240	ovate	cylindrical	0.14	0.10	0.13	0.0018
7266	circular	cylindrical	0.12	0.12	0.23	0.0033
7268	circular	conical	0.12	0.12	0.22	0.0032
7270	circular	cylindrical	0.08	0.08	0.04	0.0003
7272	circular	conical	0.14	0.14	0.15	0.0029
7274	circular	cylindrical	0.15	0.15	0.15	0.0034
7276	circular	cylindrical	0.15	0.15	0.18	0.0040

FAR, ash, and the hammerstone was the result of postabandonment dumping, although these could have been removed from intramural features upon abandonment.

Entry

An entry was present in the northeastern part of the structure. It consisted of a protruding ramp excavated slightly into the natural substrate (see Figure 72). The ramp and measured 0.70 by 0.63 m and may have been covered by brush or grasses.

Interior Features

Two nonthermal pits (Subfeatures 6976 and 6978) originated at the structure floor (see Table 28; Figure 72). Subfeature 6976 was located immediately inside the entry to the structure. This nonthermal pit was basin shaped in cross section and fairly shallow. The fill was identical to that observed in the structure, both in texture and consistency. No artifacts were recovered from the pit. Subfeature 6978 was a pit with similar characteristics that was located in the northern portion of the structure, along the wall. It contained a high density of FAR. Three pieces were collected, along with two fire-affected metate fragments and one fire-affected mano fragment. Although both intramural pits contained oxidized sediments, some charcoal, ash, and FAR, no in situ burning was noted.

Evidence of Remodeling

The posthole patterning suggests that the floor space of Feature 2628 was likely not remodeled; a wall may have been reinforced. A double line of postholes was excavated within the floor groove in the western portion of the structure (see Figure 72).

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 2628 was located at the surface of Unit IIs/sf, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit IIs/sf surface and Unit IV provides a geochronologic date of ca. 790 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

During Phase 1 investigations, a piece of charred saltbush (*Atriplex* sp.) wood from Feature 2628 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 840–800 cal. B.C. (Aeon Sample No. 742). This date corresponds to the San Pedro phase of the Late Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

The structure did not appear to have burned at the time of abandonment or afterward. Although FAR was observed in contact with the floor, it is probable that it resulted from secondary dumping that infilled the structure or rake-out from intramural features. The fill just above the floor surface was a homogeneous stratum that appeared to be the result of natural aeolian or alluvial activity that occurred while the structure sat vacant.

Stratigraphic Relationships and Associated Features

Feature 2628 originated at the surface of Unit IIs/sf, overlain by Unit IV. The geochronologic date range for this position corresponds to the Late Archaic to Pioneer period. The radiocarbon results further refined that date to the San Pedro phase. Feature 2628 intruded on the eastern edge of the neighboring San Pedro phase structure (Feature 2627) as well as on nonthermal-pit Feature 7524 (see Figure 72 and Appendix A). Another contemporaneous house-in-pit, Feature 2629, was located 7.5 m to the east. Nearby extramural features in the same stratigraphic position included Features 10933, 10907, and 10908.

Several nearby features were not contemporaneous with Feature 2628. These included Features 4592, 10905, and 10906, which originated in Unit IV. Their stratigraphic position indicates that they were used sometime during the Pioneer to Classic period. A single thermal pit (Feature 4591) in the vicinity was located on the surface of Unit IV, overlain by Unit V. The age of this thermal pit corresponds to the Pioneer to Classic period. To the north and northwest, Features 4599, 4600, 4606, and 4607 were located on the surface of Unit IIA but were overlain by Unit IV. As a result, they had a date range corresponding to the Middle Archaic to Protohistoric period.

Feature 2629

Structure type: house-in-pit
Age: San Pedro phase
Locus: Area A
Grid location: J4
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Total floor area (m^2): 4.68
Effective floor area (m^2): 4.03
Orientation: indeterminate
Length (m): 2.50
Width (m): indeterminate
Excavated depth (m): 0.12
Volume (m^3): 0.820

Excavation Methods

Feature 2629 was a San Pedro phase house-in-pit (see Table 10). It was identified in the profile of TR 2219 during Phase 1 investigations and was further defined in plan view during mechanical stripping of MSU 4580 (see Appendix A). TR 2219 removed the southern extent of the structure, so that a semicircular, organic stain containing charcoal, ash, and FAR was visible in plan view. First, a 1-by-2-m control unit (TP 6759) was hand-excavated near the center of the stain. Following that, the remaining structure fill was manually removed in one unit (Figure 74). The control unit and the remainder of the structure fill were excavated in one stratigraphic level, to the floor of the structure, which consisted of a relatively compact, continuous, and hard earthen surface. Upon excavation of TP 6759, it was recognized that the control unit had slightly over-excavated the structure beyond its northern edge (see Figure 74).

Feature Fill

A single stratum was present in Feature 2629. Containing charcoal flecks, the bulk of the fill was a dark yellowish brown silt loam. No architectural debris was present, and fine, laminated bedding and sparse gravels were observed, suggesting that this fill represented postabandonment alluvial deposition. However, a localized deposit limited to the eastern portion of the structure and in contact with the floor contained a high concentration of ash, a patch of oxidation, and several artifacts (see Figure 74). Most of the artifacts were recovered from or near that area. Three pieces of FAR, one metate fragment, and five pieces of flaked stone debitage were recovered (see Table 10).

Construction Details

<u>Walls and Roof</u>

Feature 2629 was built in a 0.12-m-deep pit. Whether the pit was circular or ovate was indeterminate because of disturbance from TR 2219. Ten wall postholes were located in the pit walls, and 2 additional postholes were centrally located in the structure floor (see Figure 74). The two central postholes may have served as roof support or functioned as other intramural subfeatures (Figure 75). All of the postholes were circular in plan view. In cross section, 10 were conical, and 2 were cylindrical (Table 29). The most-central posthole (Subfeature 6794) was the largest, and its fill contained one unidirectional core and one indeterminate ground stone fragment. The fill of the postholes was similar to that observed in the structure, suggesting that they were likely removed at the time of abandonment. Little else could be inferred concerning the construction methods or materials used for Feature 2629.

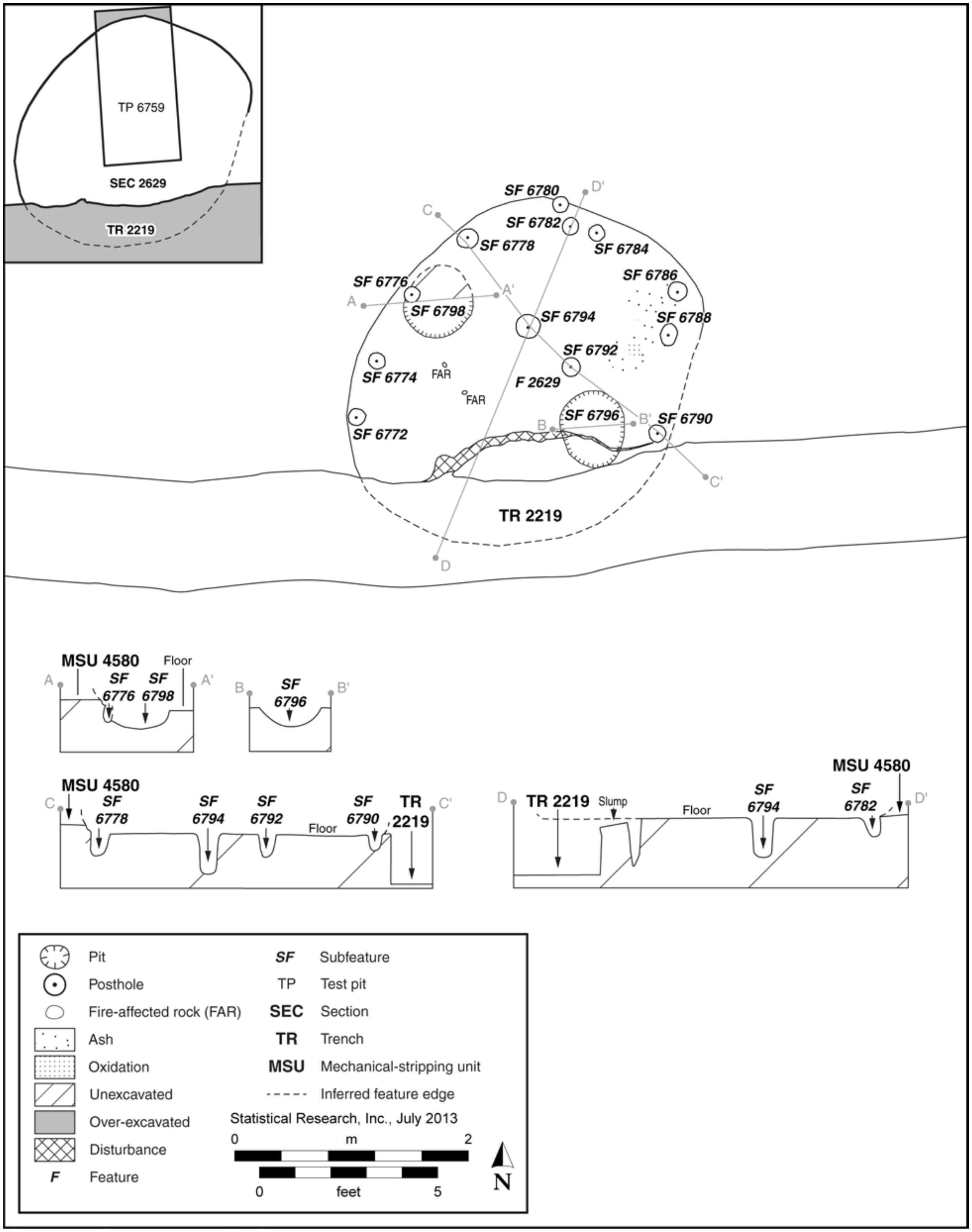

Figure 74. Post-excavation plan view and cross sections of Feature 2629 (a structure) at Falcon Landing.

Figure 75. Photograph of the floor of Feature 2629 at Falcon Landing, view to the west.

Table 29. Intramural Features in Feature 2629 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
6796	circular	basin	0.60	0.55	0.17	0.0561
6798	circular	basin	0.61	0.59	0.16	0.0576
Posthole						
6772	circular	conical	0.15	0.15	0.17	0.0038
6774	circular	conical	0.13	0.13	0.14	0.0024
6776	circular	conical	0.14	0.14	0.18	0.0035
6778	circular	cylindrical	0.16	0.16	0.22	0.0056
6780	circular	conical	0.13	0.13	0.14	0.0024
6782	circular	conical	0.15	0.15	0.17	0.0038
6784	circular	conical	0.14	0.14	0.10	0.0020
6786	circular	conical	0.16	0.16	0.22	0.0056
6788	circular	conical	0.19	0.16	0.14	0.0043
6790	circular	conical	0.14	0.14	0.15	0.0029
6792	circular	conical	0.16	0.16	0.20	0.0051
6794	circular	cylindrical	0.20	0.20	0.35	0.0140

Floor
The floor of the structure consisted of the natural substrate and displayed slight use compaction. A high concentration of ash and a patch of oxidation were present on the eastern structure floor and suggest an episode of localized burning. Two pieces of FAR were also in contact with the western structure floor (see Figure 74).

Entry
No entryway was discernible, although it may have been removed by the excavation of TR 2219.

Interior Features
Two nonthermal intramural pits were identified in the floor of the structure (see Table 29). Subfeature 6796, located in the southeastern portion of the structure, was an ovate pit that was basin shaped in cross section (see Figure 74). The fill was a yellowish brown sandy loam, similar in consistency to the structure fill. A pollen sample was collected from the pit's fill, and a macrobotanical sample was obtained from a flotation sample. These samples were submitted for further analyses (see Chapters 6 and 7, Volume 2).

Subfeature 6798 was located in the northwestern portion of the structure and was filled with the same yellowish brown sandy loam as was seen in the structure fill (see Figure 74). The pit was basin shaped in cross section and roughly circular in plan view. Only the southern half of the subfeature was excavated. Pollen and macrobotanical samples from the pit fill were submitted for further analyses (see Chapters 6 and 7, Volume 2). A wall posthole (Subfeature 6776) was intrusive to the western edge of Subfeature 6798. The fill of the pit and the fill of the posthole were identical, and it was impossible to identify which of these features was earlier. Two pieces of Historical period rubber were the only artifacts found within Subfeature 6798, and they had presumably been brought in by a recent disturbance.

No formal hearth was encountered in the structure, although an oxidized, ashy area on the eastern floor of the house appeared to have been the location of a small fire.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 2629 was located at the surface of Unit IIs/sf, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit IIs/sf surface and Unit IV provides a geochronologic date of ca. 790 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis
A piece of charred mesquite (*Prosopis* sp.) wood from Subfeature 6798 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 1030–890 cal. B.C. (Aeon Sample No. 1446). This date corresponds to the San Pedro phase of the Late Archaic period (see Chapter 2, Volume 2).

Abandonment Processes
This structure appears to have had a planned abandonment, because only FAR was found in contact with the floor. The fill of the structure, postholes, and intramural pits contained finely laminated sediments, suggesting that the structure had been dismantled and subsequently infilled by natural alluvial and aeolian processes. The paucity of artifacts further supports this scenario. However, sometime shortly after abandonment, a deposit of secondary refuse was placed in the eastern portion of the structure.

Stratigraphic Relationships and Associated Features

Feature 2629 originated at the surface of Unit IIs/sf, overlain by Unit IV. The geochronologic date range for this position corresponds to the Late Archaic to Pioneer period. The radiocarbon results further refined that date to the San Pedro phase. The structure was built on top of a nonthermal pit, Feature 6887, that originated in the same stratigraphic unit as structure Feature 2629 but clearly predated it (see Appendix A). Two nearby contemporaneous structures, Features 2627 and 2628, were 4.5 m to the west. The nearest extramural pit that shared a stratigraphic position with Feature 2629 was Feature 4590, a nonthermal pit to the northeast.

Feature 2967

Structure type: house-in-pit
Age: San Pedro phase
Locus: Area B
Grid location: D1
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Total floor area (m²): 1.39
Effective floor area (m²): 1.39
Orientation: indeterminate
Length (m): indeterminate
Width (m): 1.77
Excavated depth (m): 0.16
Volume (m³): 0.410

Excavation Methods

Feature 2967 was a possible house-in-pit dating to the San Pedro phase (see Table 10) that was identified during the mechanical excavation of TR 4211. Mechanical stripping of MSU 4342 exposed Feature 2967 in plan view, where it appeared as a charcoal-stained semicircle on the substrate. The trench had truncated the approximate southern half of the feature (Figures 76 and 77; see Appendix A).

Prior to hand-excavation of Feature 2967, an intrusive nonthermal pit (Feature 4234) was excavated. The plan of the nonthermal pit was defined using HSU 2691, and the remaining feature fill was removed (see Figure 77). Next, HSU 2975 was used to better define Feature 2967 in plan view, although a baulk of sediment holding the intrusive Feature 4234 was left in place to show the relationship of the two features. After the boundaries of the feature had been defined, a 0.50-by-0.50-m control unit (TP 2979) was excavated in the western part of the structure (see Figure 77). It was excavated in two levels; Level 1 was excavated to an arbitrary depth, and Level 2 ended at the structure floor. Level 1 was designated feature fill, and Level 2 was designated floor fill. Macrobotanical and pollen samples were obtained from each level and submitted for further analysis (see Chapters 6 and 7, Volume 2). The remainder of the feature was excavated in one unit (SEC 2982) (see Figure 77). Again, the section fill was divided into Levels 1 and 2, similar to TP 2979.

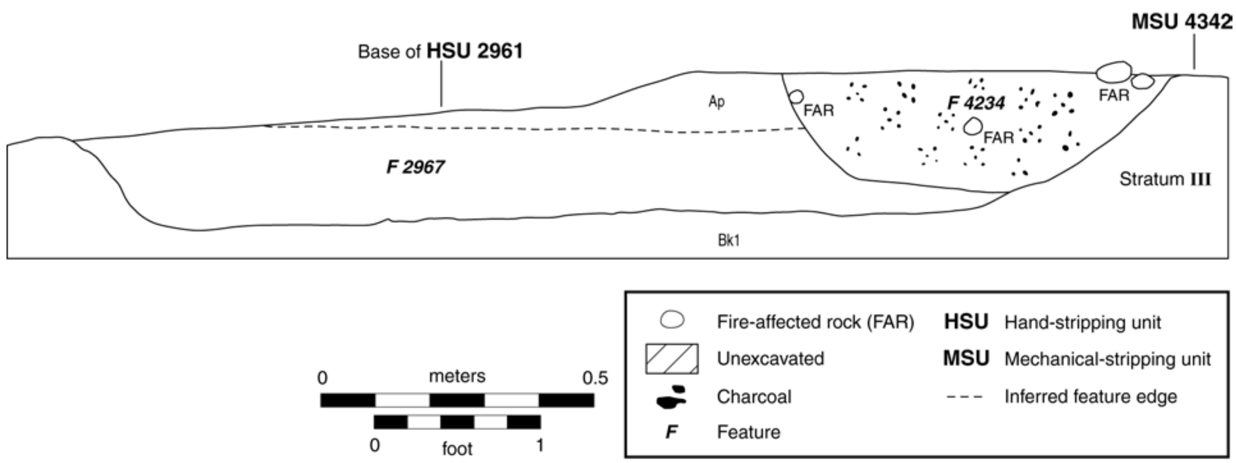

Figure 76. Profile of Features 2967 (a structure) and 4234 (an intrusive pit), in the northern face of TR 4211, at Falcon Landing.

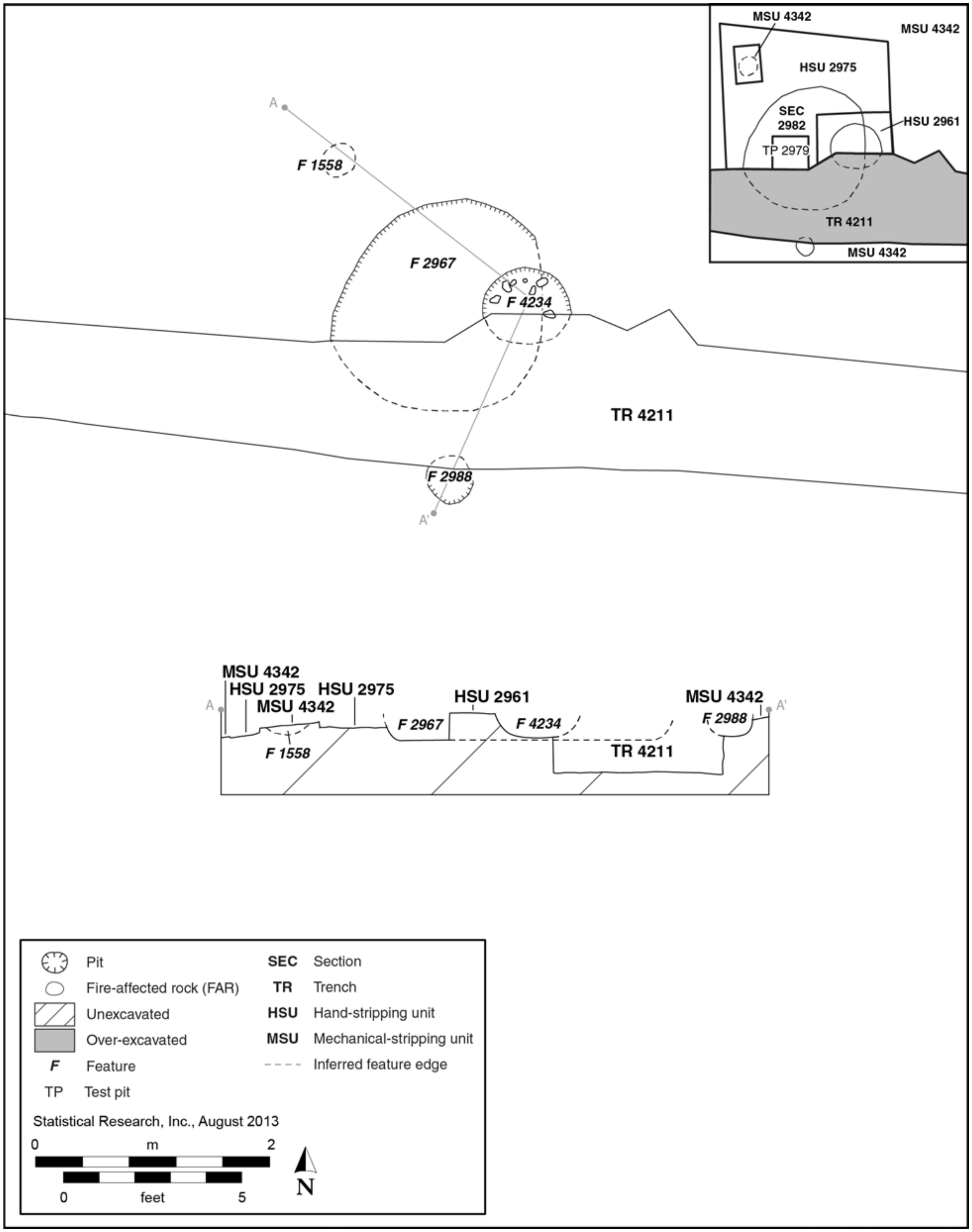

Figure 77. Post-excavation plan view and cross section of Features 2967 (a structure), 2988 (a nearby pit), and 4234 (an intrusive pit) at Falcon Landing. (*Note:* Feature 1558 [a nearby pit] was examined at a later time.)

Feature Fill

Feature 2967 contained a single stratum of a dark yellowish brown clay loam. A fine lamina was visible in some parts of the feature. Sparse charcoal fragments in the upper fill increased in density toward the floor. Small pieces of oxidized sediment were found throughout the fill in low to moderate densities and were more common in the northern part of the feature. A single piece of flaked stone debitage was the only artifact recovered (see Table 10). Macrobotanical and pollen samples from Level 1 and 2 of the test pit were submitted for analyses (see Chapters 6 and 7, Volume 2).

Construction Details

Walls and Roof

Feature 2967 was built either in or around a pit that was at least 0.16 m in depth; no postholes were identified (Figure 78). The pit was likely circular in plan view, but it had been truncated by TR 4211. Very little can be said about the structure walls and roof, because no architectural debris was preserved within the structure fill. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The floor of the structure consisted of the underlying natural substrate. No artifacts were identified in contact with the surface.

Entry

No entryway was noted during the excavations. It is possible that the entryway was removed by TR 4211.

Figure 78. Photograph of Feature 2967 as exposed in HSU 2975. Feature 4234 (an intrusive pit) is visible (unexcavated) on the right side of the photograph, view to the northwest.

Interior Features

No intramural pits were found, but concentrations of ash and charcoal were found toward the northern edge, and oxidation on the northwestern portion of the floor may have been the location of a surficial hearth.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 2967 was located within Unit III1, for which the bracketing date range is ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of charcoal from an unknown plant was recovered from Level 1 of TP 2979 and submitted to Aeon for AMS analysis. The charcoal returned a 2σ calibrated date of 1110–1000 cal. B.C. (Aeon Sample No. 1408), corresponding to the San Pedro phase of the Late Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

The small amount of charcoal in the structure fill indicates that the structure did not burn. Some parts of the fill contained fine laminae of water and wind-deposited sediments. The feature was probably filled naturally with culture-bearing sediments from the site surface. The lack of identifiable intramural features or artifacts suggests that the structure was impermanent or was occupied for a short period of time.

Stratigraphic Relationships and Associated Features

Feature 2967 had a geochronologic date range corresponding to the Middle to Late Archaic period. A non-thermal pit, Feature 4234, intruded into the southeastern corner of Feature 2967 and therefore postdated the structure (see Appendix A and Figure 77). A potentially contemporaneous structure, Feature 4349, was about 9 m to the northeast and in the same stratigraphic unit as Feature 2967. Six extramural pits in the vicinity also existed in Unit III1: Features 2967, 4234, 4346, 4358, 4359, and 4370. Two features originating in Unit IIs/sf also dated to the Middle to Late Archaic period: Features 4356 and 4357. Neighboring features in Unit I/Unit III1 dated to the Early to Middle Archaic period and were also potentially contemporaneous with Feature 2967: Features 1558, 2988, 2989, 4347, 4353, and 4354.

Feature 4302

Structure type: house-in-pit
Age: San Pedro phase
Locus: Area B
Grid location: E2
Level of effort: complete
Plan-view shape: indeterminate
Cross-sectional shape: basin

Total floor area (m^2): 4.69
Effective floor area (m^2): 4.17
Orientation: indeterminate
Length (m): 2.30
Width (m): indeterminate
Excavated depth (m): 0.09
Volume (m^3): 0.680

Excavation Methods

Feature 4302 was a San Pedro phase house-in-pit (see Table 10). The structure was originally identified during mechanical excavation of MSU 4268 (see Appendix A). The southern portion of the structure was truncated during mechanical excavation (Figure 79). In plan view, it appeared as a dark stain on the stripping surface and contained charcoal, ash, flaked stone, and FAR. Hand-excavation proceeded with the placement

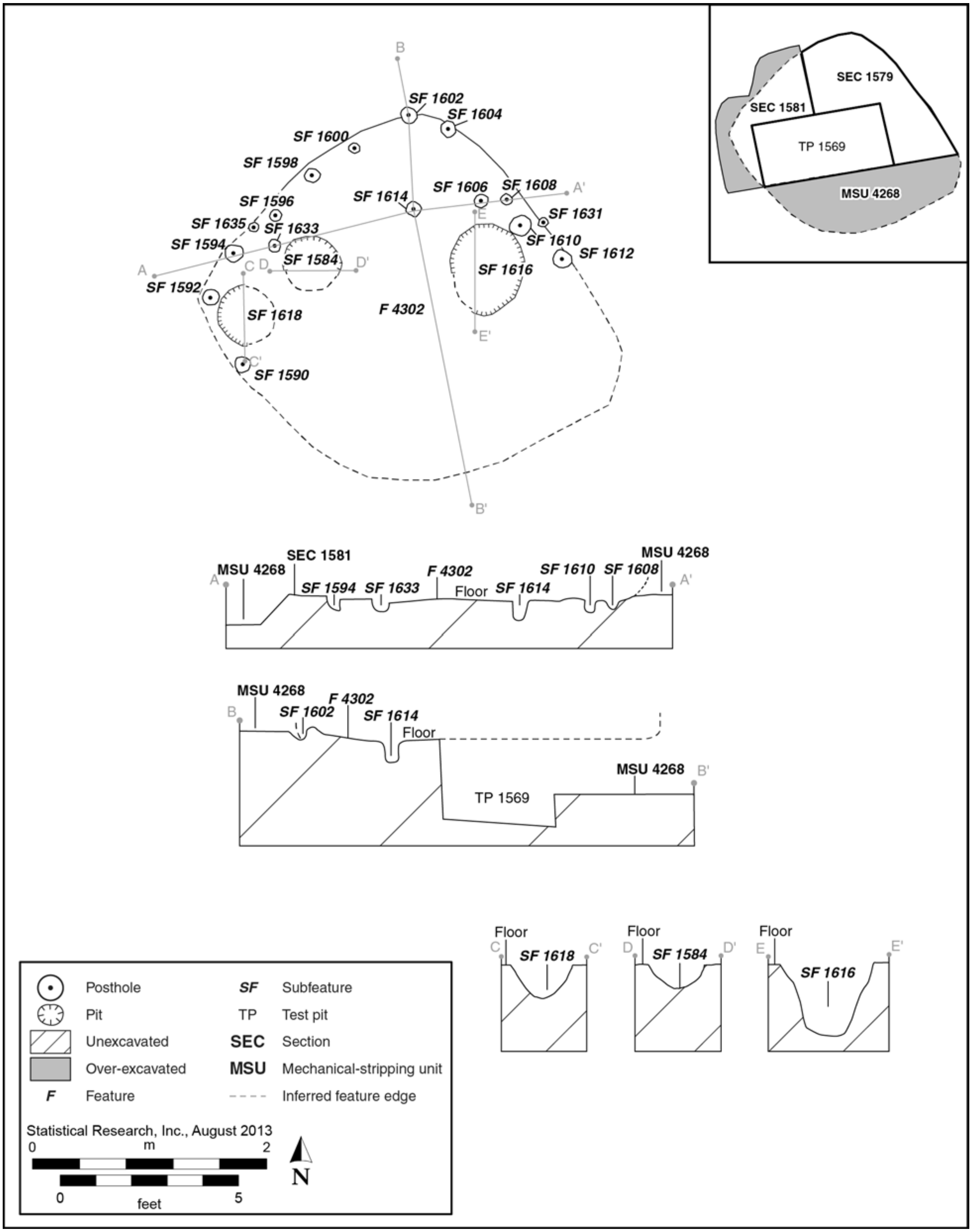

Figure 79. Post-excavation plan view and cross sections of Feature 4302 (a structure) at Falcon Landing.

of a 1-by-2-m control unit (TP 1569) in the center of the feature (see Figure 79). TP 1569 was excavated below the floor, and cultural material was recovered from the levels below the floor. The floor of the structure and three intramural pits were later observed in the test-pit profile. It is possible that some or all of the artifacts recovered from the test-unit levels below the structure floor originated from the intramural pits. The structure was then bisected, with SEC 1579 in the eastern half and SEC 1581 to the west of the test pit (see Figure 79). SEC 1579 was excavated in a single level before reaching the floor. SEC 1581 was excavated in two levels; the first was 4–6 cm thick, and the second was a 1-cm level of floor fill.

Feature Fill

The structure pit had a maximum depth of 0.09 m and contained a single stratum of moderately hard, dark yellow brown silty clay loam with occasional small gravel and charcoal fragments. Bioturbation in the form of moderate insect disturbance was noted. Artifacts in the structure included 134 pieces of flaked stone debitage, 1 broken Elko Corner-notched projectile point, 1 biface, 1 multidirectional core, 29 pieces of unworked faunal bone, 1 *Olivella*-shell bead, and 1 piece of FAR (see Table 10).

Construction Details

Walls and Roof

Feature 4302 was constructed within a pit that was at least 0.07 m in depth. The shape of the pit is unknown because of mechanical disturbance in the southern portion of the structure. Twelve postholes associated with the structure walls were located within the sides of the pit (Figure 80). Four additional postholes were found in the structure floor and may represent the remains of roof- and wall-support posts (see Figure 79). The fill of the postholes appeared to be the same as the structure fill. Subfeature 1631 contained a piece of

Figure 80. Photograph of the floor of Feature 4302 at Falcon Landing, view to the southeast.

Table 30. Intramural Features in Feature 4302 at Falcon Landing

Subfeature No., by Subfeature Type	Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit							
1584	nonthermal pit	indeterminate	irregular	0.50	indeterminate	0.19	indeterminate
1616	nonthermal pit	indeterminate	conical	0.76	indeterminate	0.58	indeterminate
1618	nonthermal pit	indeterminate	irregular	0.50	indeterminate	0.28	indeterminate
Posthole							
1590	posthole	circular	cylindrical	0.12	0.12	0.11	0.0016
1592	posthole	circular	conical	0.14	0.14	0.10	0.0020
1594	posthole	circular	conical	0.14	0.14	0.10	0.0020
1596	posthole	circular	conical	0.12	0.12	0.09	0.0013
1598	posthole	circular	cylindrical	0.13	0.13	0.11	0.0019
1600	posthole	circular	cylindrical	0.11	0.11	0.11	0.0013
1602	posthole	circular	conical	0.14	0.14	0.09	0.0018
1604	posthole	circular	cylindrical	0.16	0.16	0.09	0.0023
1606	posthole	circular	cylindrical	0.12	0.12	0.08	0.0012
1608	posthole	circular	conical	0.11	0.11	0.08	0.0010
1610	posthole	circular	conical	0.19	0.18	0.18	0.0062
1612	posthole	circular	irregular	0.17	0.16	0.18	0.0049
1614	posthole	circular	conical	0.14	0.14	0.18	0.0035
1631	posthole	circular	cylindrical	0.11	0.11	0.11	0.0013
1633	posthole	circular	cylindrical	0.13	0.13	0.10	0.0017
1635	posthole	circular	cylindrical	0.11	0.11	0.08	0.0010

faunal bone, Subfeature 1608 contained two pieces of flaked stone debitage, and Subfeatures 1610, 1633, and 1635 each contained a piece of debitage (Table 30). The posts probably supported brush walls and a roof.

Floor

The floor surface was unprepared. A slight change in stratum was visible in the test-pit profile. The floor was also identified by the appearance of intramural pits and postholes. No artifacts were found in contact with the floor.

Entry

No entryway was noted during the excavations. It is possible that the entryway may have been located in the truncated southern part of the structure.

Interior Features

Three intramural pits (Subfeatures 1584, 1616, and 1618) were found and excavated within Feature 4302 (see Figure 79; Table 30). All three pits were nonthermal and appeared to contain no evidence of direct or indirect burning. All had been truncated by the test pit and were visible in profile in the sidewall of the unit.

Subfeature 1584 contained an unburned, yellow brown silty clay loam that was similar to the pit-structure fill, although no charcoal was present in the subfeature. At the base of the pit, the fill had a higher concentration of sand. A single piece of flaked stone debitage was recovered.

Subfeature 1616 had a conical cross section and contained a dark yellow brown silt loam with a compact, possibly water-lain, silt in the bottom 10 cm of the pit. Artifacts in the fill included 13 pieces of flaked stone debitage and 3 pieces of faunal bone. A pollen sample was collected from the base of the pit and sent for further analysis (see Chapter 7, Volume 2).

Subfeature 1618 was also truncated by the test pit and appeared to be the western half of a circular or ovate pit. It was 50 cm in diameter and 28 cm in depth and had an irregularly shaped cross section. Its fill was very similar to that within Subfeature 1584, a yellow brown silty clay loam with no ash or charcoal. One piece of lithic debitage and one faunal bone were recovered from the pit.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
An Elko Corner-notched projectile point was recovered from Level 1 of TP 1569. According to Holmer (1986), Elko-style projectile points have a very wide date range of ca. 6900 B.C.–A.D. 700.

Geochronologic Analysis
Feature 4302 was located within Unit III1, the bracketing age range of which is ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis
A piece of burned mesquite (*Prosopis* sp.) wood was collected from the structure fill and submitted to Aeon for AMS analysis. The charcoal returned a 2σ calibrated date of 1130–1000 cal. B.C. (Aeon Sample No. 678). This date range corresponds to the San Pedro phase of the Late Archaic period.

Abandonment Processes
The small amount of charcoal in the structure fill and the absence of oxidation and charcoal staining within the fill and on the floor indicate that the structure did not burn. The high density of artifacts within the structure may have resulted from trash disposal in the abandoned house during the occupation of the site. No stratification was visible in the pit fill, but it may have been obscured by bioturbation.

Subfeatures 1584 and 1618 contained fill that was similar to that of the pit structure. In these subfeatures, sand and silt were present at the bases of the pits and may have been deposited by natural processes. The postholes also contained the same fill as the structure.

Stratigraphic Relationships and Associated Features
Feature 4302 was located in stratigraphic Unit III1, dating to the Middle to Late Archaic period. The date range was further narrowed by the radiocarbon date, which placed the feature in the San Pedro phase. Another structure, Feature 4308, was located 10 m to the northeast and was slightly more recent in age (see Appendix A). The structures are potentially contemporaneous.

Eighteen nearby features were in the same stratigraphic position as the structure and were potentially in use during the same time: Features 1559, 4287, 4288, 4289, 4291, 4292, 4293, 4294, 4295, 4297, 4302, 4303, 4304, 4313, 4315, 4321, 4324, and 4325. Other nearby pits dated to the Early to Middle Archaic period: Features 4237, 4290, 4365, and 4366.

Feature 4308
Structure type: house-in-pit
Age: San Pedro phase
Locus: Area B
Grid location: E2
Level of effort: complete
Plan-view shape: ovate
Total floor area (m²): 2.30
Effective floor area (m²): 1.78
Orientation: indeterminate
Length (m): 2.20
Width (m): 1.74
Excavated depth (m): 0.17

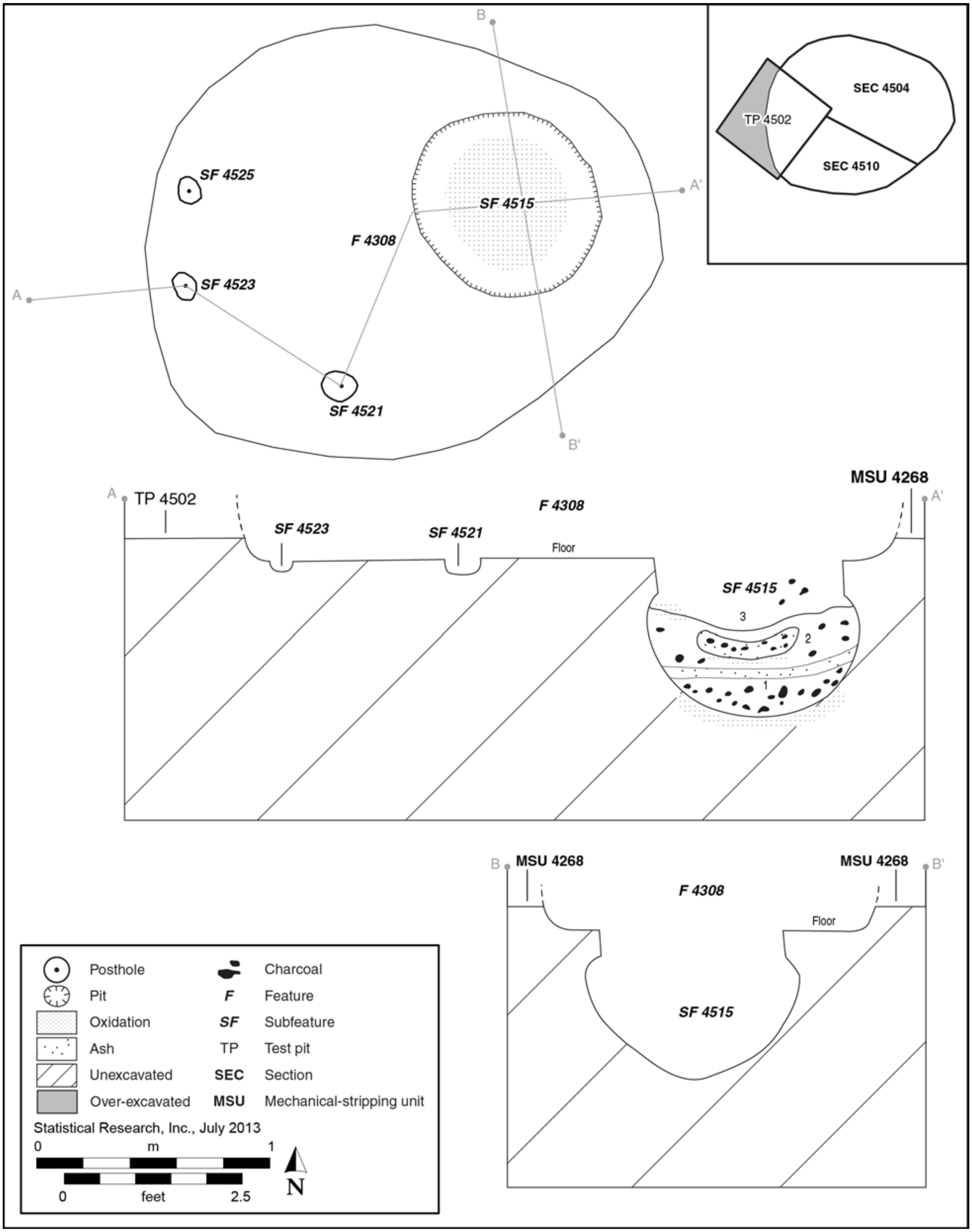

Figure 81. Post-excavation plan view and cross sections of Feature 4308 (a structure) at Falcon Landing.

Cross-sectional shape: basin **Volume (m^3)**: 0.540

Excavation Methods

Feature 4308 was a San Pedro phase house-in-pit (see Table 10). The structure was discovered during mechanical excavation of MSU 4268, appearing as an organic stain on the stripping surface (see Appendix A). A 1-by-1-m control unit (TP 4502) was hand-excavated in the western portion of the feature. The feature was much smaller than originally identified, and the uppermost portion of the test pit was slightly over-excavated. The remainder of the structure was excavated in two sections; the northeastern half of the structure was excavated as SEC 4504, and the southwestern half was excavated as SEC 4510 (Figure 81).

Feature Fill

The feature contained a single stratum of brown, slightly sandy silt loam with charcoal flecks. Extensive root bioturbation disturbed the upper 15 cm of fill in all of the structure but the eastern part. Artifacts in the fill included 12 pieces of faunal bone, 1 biface, 1 cobble uniface, 13 pieces of flaked stone debitage, 2 mano fragments, 3 indeterminate ground stone fragments, and 46 pieces of FAR (see Table 10).

Construction Details

Walls and Roof

The structure was built within an ovate pit that was at least 0.17 m in depth. Three postholes were found and excavated in the southwestern portion of the structure (Figure 82; Table 31; see Figure 81). The posts probably supported brush walls and a roof.

Floor

The floor of the structure consisted of the natural substrate, which lacked the charcoal flecks found in the structure fill. No artifacts were in contact with the floor.

Figure 82. Photograph of the floor of Feature 4308 at Falcon Landing, postholes not yet excavated, view to the north–northeast.

Table 31. Intramural Features in Feature 4308 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Posthole						
4521	circular	cylindrical	0.16	0.14	0.07	0.0016
4523	ovate	cylindrical	0.12	0.09	0.04	0.0004
4525	circular	cylindrical	0.10	0.09	0.05	0.0004
Thermal pit (bell shaped)						
4515	circular	bell	0.87	0.80	0.55	0.3828

Entry

No entryway was identified.

Interior Features

A single comparatively large thermal bell-shaped pit (Subfeature 4515) was excavated in the eastern end of the structure (see Figure 81; Table 31), in two sections. The southern half, SEC 4518, was excavated in a single level and revealed three strata. Artifacts recovered from SEC 4518 included one projectile point, one piece of unworked faunal bone, and seven pieces of flaked stone debitage. The northern half, SEC 4516, was excavated in three stratigraphic layers. All of the strata consisted of a brown silty loam with varying degrees of compaction and artifact density. The uppermost deposit in the pit, Stratum 3, contained a low density of charcoal. Stratum 2 contained large chunks of charcoal, four pieces of flaked stone debitage, and four pieces of FAR (not collected). The pit walls were oxidized at the level of Stratum 2. An ash deposit lay at the base of that stratum, capping the bottom layer, Stratum 1. The bottom stratum was moderately compact and contained chunks of charcoal, three pieces of FAR (not collected), and less oxidation than was seen in the upper layers. A layer of loose sand lined the base of the pit. Pollen and macrobotanical samples were recovered from Stratum 2 and submitted for further analysis (Chapters 6 and 7, Volume 2).

In total, the pit contained 13 artifacts, including a projectile point, 1 faunal-bone specimen, 11 pieces of flaked stone debitage, and 8 pieces of FAR. The FAR was not collected. Most of the artifacts were recovered from Level 1.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

A projectile point was recovered from Subfeature 4515, but it was a distal fragment and therefore was not assigned to a specific typology.

Geochronologic Analysis

Feature 4308 was located within Unit III1, the bracketing age range of which is ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A radiocarbon sample of charred mesquite (*Prosopis* sp.) wood was collected from the upper house fill and submitted for analysis. It returned a 2σ calibrated date range of 1010–920 cal. B.C. (Aeon Sample No. 748). This range corresponds to the San Pedro phase of the Late Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

The structure does not appear to have burned. The feature fill did not exhibit any stratification that would have resulted from natural processes, although it may have been obscured by bioturbation. The FAR and the artifacts in the fill probably resulted from intentional refuse deposition during the occupation of the site. It is likely that the structure was abandoned and subsequently covered by natural alluvial or aeolian sediments.

The intramural bell-shaped pit, Subfeature 4515, had three layers of deposition. The lowest layer, Stratum 1, was characterized by a moderately hard, homogeneous silty loam intermixed with charcoal that rested on a loose layer of sand. Stratum 2 appeared to have been a deposit of ash and FAR that caused oxidation of the pit walls. This deposit may have been taken from a thermal feature, because the oxidation did not seem to have resulted from in situ burning. The upper stratum may have been a trash deposit. The top of the pit was also compacted, possibly from use of the house after the pit was filled. The stratigraphy of Subfeature 4515 suggests multiple episodes of dumping, with the final event perhaps indicating an intentional capping of the pit.

Stratigraphic Relationships and Associated Features

The geochronologic dates of the structure placed it in the Middle to Late Archaic period. The radiocarbon results narrowed that to the San Pedro phase of the Late Archaic period. A potentially contemporaneous structure also dated to the San Pedro phase was located 10 m to the southeast (Feature 4302) (see Appendix A). Most other extramural features within 10 m of Feature 4308 were also in Unit III1. These included 14 extramural pits (Features 4263, 4271, 4272, 4273, 4303, 4304, 4306, 4310, 4313, 4315, 4317, 4321, 4404, and 4405). Two FAR concentrations (Features 4264 and 4267) and a charcoal/ash lens (Feature 4265) were also among the pits within 10 m of Feature 4308. One nonthermal pit within 10 m of Feature 4308 (Feature 4316) dated to the Late Archaic to Protohistoric period.

Feature 11181

Structure type: house-in-pit
Age: San Pedro phase
Locus: Area B
Grid location: E1
Level of effort: complete
Plan-view shape: subsquare
Cross-sectional shape: basin
Total floor area (m^2): 2.51
Effective floor area (m^2): 2.24
Orientation: southeast
Length (m): 1.82
Width (m): 1.80
Excavated depth (m): 0.10
Volume (m^3): 0.050

Excavation Methods

Feature 11181 was a possible house-in-pit that dated to the San Pedro phase (see Table 10). The structure was identified during mechanical excavation of MSU 11160 (see Appendix A). It appeared as a large, subsquare, organic stain containing charcoal flecking, ash, and FAR. A 1-by-1-m control unit (TP 12240) was first hand-excavated near the center of the stain. The remaining structure fill was then manually removed in one section (SEC 12243) (Figure 83).

The control unit and section ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. Because of shallow depth and lack of stratigraphy, both the control unit and the section were excavated in one level. Flotation samples were collected from both the control unit and the section, and a pollen sample was scraped from the structure floor.

Feature Fill

A single stratum was present in the fill of Feature 11181. It consisted of a moderately hard, yellowish brown sandy clay loam containing sparse, dispersed charcoal flecking, ash, and FAR. The fill displayed laminated sediments consistent with aeolian and alluvial deposition. Other than 26 pieces of FAR, no artifacts or architectural debris was present in the fill. Charcoal obtained from a floatation sample (SEC 12243, Level 1) was submitted for further analysis (see Chapter 6, Volume 2).

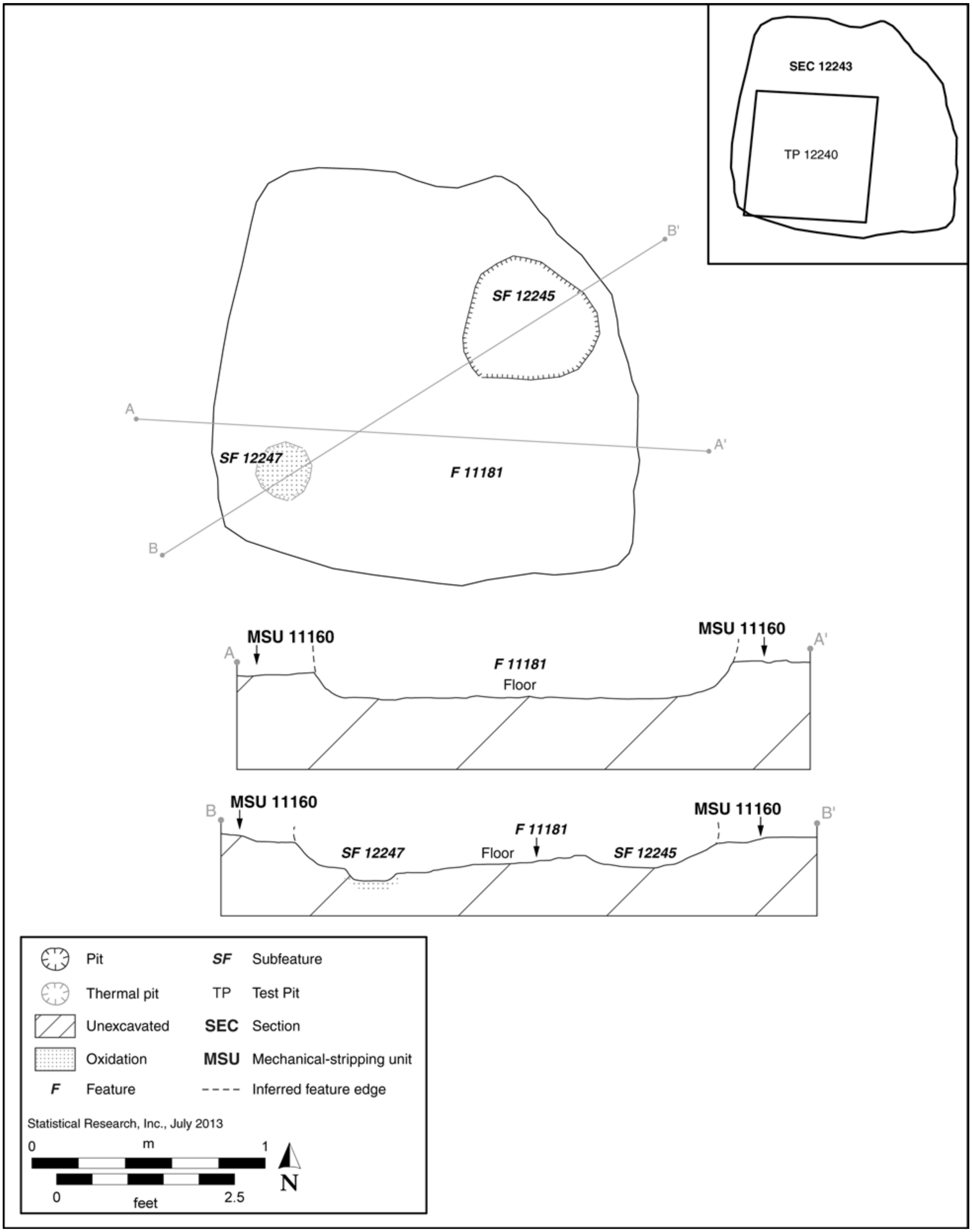

Figure 83. Post-excavation plan view and cross sections of Feature 11181 (a structure) at Falcon Landing.

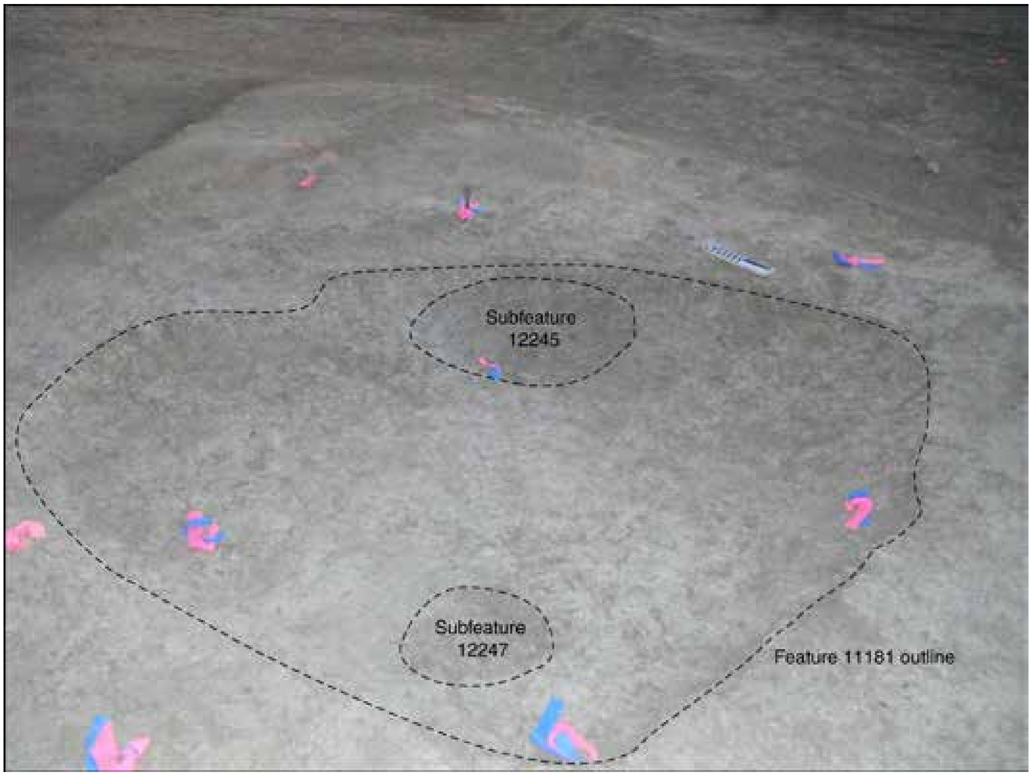

Figure 84. Photograph of the floor of Feature 11181 at Falcon Landing, view to the north–northeast.

Construction Details

Walls and Roof

Feature 11181 was built either in or around a 0.10-m-deep subsquare pit (Figure 84). Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. Additionally, because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The floor of the structure consisted of the natural substrate and was lighter in color than the structure fill. It displayed noticeable use compaction and contained ash staining associated with Subfeatures 12245 and 12247. No artifacts were found in contact with the floor.

Entry

No entryway was discernible.

Interior Features

One nonthermal pit (Subfeature 12245) and a thermal pit (Subfeature 12247) originated in the floor of Feature 11181 (Table 32; see Figure 83). Each subfeature was excavated in one stratigraphic unit and level, and because of their small size, all fill was collected for flotation sampling. After excavation, a pollen sample was scraped from the base of each pit.

The nonthermal pit (Subfeature 12245) was unlined, and the walls consisted of the natural substrate. It was basin shaped in cross section and circular in plan view and measured 0.03 m in depth and 0.26 m in diameter. The fill consisted of a brown sandy clay loam mottled with a moderate amount of charcoal flecking and ash. It was darker than the structure fill and contained more charcoal and ash. Furthermore, the fill

Table 32. Intramural Features in Feature 11181 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Thermal pit						
12247	circular	basin	0.20	0.18	0.03	0.0011
Nonthermal pit						
12245	circular	basin	0.26	0.22	0.03	0.0017

was homogeneous and did not display laminated sediments consistent with aeolian and alluvial deposition. It was interpreted that the fill of Subfeature 12245 was possibly associated with cleanout of the thermal pit (Subfeature 12247). No artifacts were present within Subfeature 12245, but the pollen sample from the pit base and charcoal from the fill were submitted for analysis (see Chapters 6 and 7, Volume 2).

The thermal pit (Subfeature 12247) was unlined, and the walls consisted of the natural substrate. It was basin shaped in cross section and circular in plan view. It measured 0.03 m in depth and 0.20 m in diameter. The fill consisted of a brown sandy clay loam with moderate amounts of charcoal, ash, oxidized sediment, and FAR. It was darker than the structure fill and contained more charcoal and ash. The base of the pit was heavily oxidized, as were the sides, but to a lesser extent. The fill was massive and appeared to be the actual remains from the last time the feature was burned. Seven pieces of FAR were the only artifacts present in the fill of Subfeature 12247.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 11181 originated at or near the surface of Unit II, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit II surface and Unit IV provides a geochronologic date of ca. 2730 cal. B.C.–cal. 610 A.D. (see Chapter 2, Volume 2).

Radiocarbon Analysis
A fragment of mesquite (*Prosopis* sp.) charcoal recovered from the fill of Subfeature 12245 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 1110–1000 cal. B.C. (Aeon Sample No. 1439) (see Chapter 2, Volume 2). This date range places the use of the structure in the San Pedro phase of the Late Archaic period.

Abandonment Processes
The structure seems to have had a planned abandonment, because the only artifacts found near the floor were FAR, which seems to represent trash disposal within the house pit shortly after structure abandonment. Laminated sediments consistent with aeolian and alluvial deposition found throughout the fill indicate that natural processes played a significant role in the filling of the structure pit. These sediments were in contact with the floor, possibly indicating that the structure was dismantled upon abandonment. No architectural debris was present in the fill. The two intramural pits contained different sediments that were possibly associated with the use of the structure.

Stratigraphic Relationships and Associated Features
Feature 11181 was constructed on the Unit II surface, with a date range that corresponds to the Middle Archaic to Pioneer period. The radiocarbon results narrowed the age to the San Pedro phase. One nearby structure (Feature 11229) was dated to the late Chiricahua phase and was therefore slightly older than Feature 11181.

Most of the extramural pits within 10 m of Feature 11181 originated in the same stratigraphic unit and were potentially contemporaneous (see Appendix A). These included two thermal pits (Features 3200 and 11172) and 23 nonthermal pits (Features 3201, 3202, 3203, 3207, 3198, 3199, 11167, 11168, 11169, 11170, 11173, 11174, 11175, 11176, 11177, 11179, 11180, 11182, 11183, 11185, 11186, 11195, and 11196). Several features had broad age ranges from the Middle Archaic to Protohistoric period; these included 13 nonthermal pits (Features 11178, 11184, 11193, 11197, 11198, 11199, 11200, 11202, 11209, 11210, 11211, 11213, and 11214).

Feature 13071

Structure type: house-in-pit
Age: San Pedro phase
Locus: Area A
Grid location: J3
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: irregular
Total floor area (m²): 7.04
Effective floor area (m²): 6.20
Orientation: indeterminate
Length (m): 3.40
Width (m): 3.15
Excavated depth (m): 0.13
Volume (m³): 1.070

Excavation Methods

Feature 13071 was a San Pedro phase house-in-pit (see Table 10). The structure was identified during mechanical excavation of MSU 10893 (see Appendix A). Upon identification, it appeared as a large, circular, organic stain containing dispersed charcoal flecking, ash, and FAR. A 1-by-1-m control unit (TP 14406) was first hand-excavated near the center of the stain. The remaining structure fill was then manually removed in one section (SEC 16560) (Figure 85).

The control unit and section ended at the floor surface, which consisted of a slightly lighter, relatively compact, continuous earthen surface. Because of shallow depth and lack of stratigraphy, the control unit and the section were excavated in one level. Flotation samples were collected from both units, and a pollen sample was scraped from the floor surface.

Feature Fill

A single stratum was present within the fill of Feature 13071. It consisted of a mottled light gray, light brown, and dark yellowish brown silt clay loam containing a moderate amount of charcoal, ash, and FAR. The fill displayed a mixture of deposits, including laminated sediments consistent with aeolian and alluvial deposition and massive deposits that appeared to be the results of intentional dumping. No architectural debris was present. In addition to charcoal and ash, the structure fill contained 82 pieces of FAR, 8 pieces of flaked stone debitage, 5 indeterminate ground stone fragments, and 1 unworked faunal-bone fragment (see Table 10).

Construction Details

Walls and Roof

Feature 13071 was built within a circular pit that measured 3.40 m in diameter and 0.13 m in depth (Figure 86). Six postholes were identified in association with the structure walls, and an additional posthole was located in the center of the structure, perhaps for structure support (see Figure 85). All of the wall postholes lined the inside pit edge. The postholes measured between 0.13 and 0.18 m in diameter and between 0.07 and 0.10 m in depth, with the exception of the two southern postholes (Subfeatures 16639 and 16970), which were very large, measuring 0.25 and 0.30 m in diameter and 0.11 and 0.14 m in depth, respectively (Table 33). All were circular in plan view and cylindrical in cross section. Their fill was similar to the structure fill, a light gray to light brown silty clay loam. Three of the postholes contained sparse charcoal flecking but no oxidation. No artifacts were present in any of the postholes, but charcoal from the fill of Subfeature 16970 was submitted for further analysis (see Chapter 6, Volume 2). Because no architectural debris was identified in the structure fill, little else can be interpreted regarding the walls and roof of the structure.

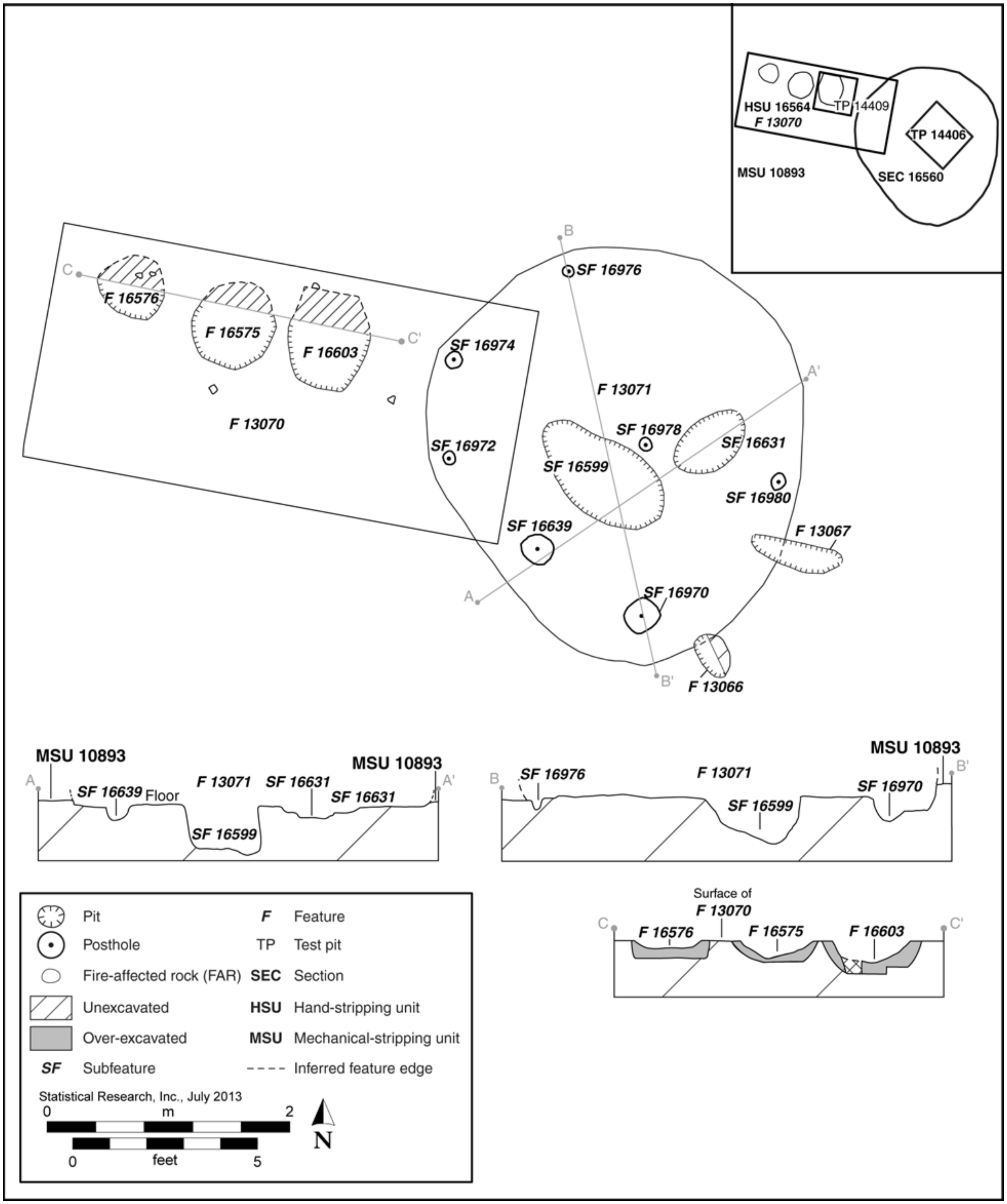

Figure 85. Post-excavation plan view and cross sections of Feature 13071 (a structure) at Falcon Landing. The locations of Features 13066 and 13067 (intrusive pits) are also depicted in the plan view.

Figure 86. Photograph of the floor of Feature 13071 at Falcon Landing, view to the east.

Table 33. Intramural Features in Feature 13071 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
16599	ovate	irregular	1.10	0.62	0.31	0.2114
16631	ovate	irregular	0.55	0.25	0.10	0.0138
Posthole						
16639	circular	cylindrical	0.25	0.24	0.11	0.0066
16970	circular	cylindrical	0.30	0.27	0.14	0.0113
16972	circular	cylindrical	0.15	0.13	0.09	0.0018
16974	circular	cylindrical	0.15	0.14	0.08	0.0017
16976	circular	cylindrical	0.13	0.13	0.09	0.0015
16978	circular	cylindrical	0.15	0.13	0.07	0.0014
16980	circular	cylindrical	0.18	0.14	0.10	0.0025

Floor

The floor of the structure consisted of the natural substrate, which displayed noticeable use compaction and patches of charcoal and ash staining. No artifacts were found in contact with the floor, but a pollen sample from the surface was submitted for further analysis (see Chapter 7, Volume 2).

Entry

No entryway was discernible.

Interior Features

Two nonthermal pits (Subfeatures 16599 and 16631) originated at the floor, near the center of the structure (see Figure 85). Each pit had an unprepared base and walls, which consisted of the natural substrate, and contained a single stratum of light brown silt loam. The texture of the intramural-pit fill was massive and more homogeneous than that of the structure fill, as though the pits had been intentionally filled prior to the filling of the structure pit. Each pit was sampled for pollen and flotation, and their remaining fill was screened through 1/4-inch mesh. Artifacts were not present within either pit.

Subfeature 16599 was irregularly shaped in cross section and measured 0.31 m in depth. The walls ranged from straight to gently sloping, and the base undulated from flat to basin shaped. In plan view, the pit was ovate and measured 1.10 m in length and 0.62 m in width (see Table 33). Moderate amounts of dispersed charcoal flecking and ash were present throughout the fill. It was excavated in two sections (SECs 16600 and 16855), each containing one level that was terminated at the base of the pit.

Subfeature 16631 was also irregularly shaped in cross section and measured 0.10 m in depth. The pit appeared to have a second shallow pit set into the base of the larger pit. In plan view, the feature was ovate and measured 0.55 m in length and 0.25 m in width (see Table 33). A sparse quantity of dispersed ash was present throughout the fill. It was excavated in two sections (SECs 16632 and 16852), each containing one level that was terminated at the base of the pit.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 13071 originated at the surface of Unit IIs/sf, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the surface of Unit IIs/sf and Unit IV provides a geochronologic date range of ca. 790 cal. B.C.–A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A fragment of mesquite (*Prosopis* sp.) charcoal recovered from the fill of Subfeature 16970 was submitted for AMS dating and returned a 2σ calibrated date range of 970–830 cal. B.C. (Aeon Sample No. 1487) (see Chapter 2, Volume 2). This date range places the use of the structure in the San Pedro phase of the Late Archaic period.

Abandonment Processes

The structure fill possessed no evidence of structural debris; however, based on the age of the structure, the architectural components could have completely decomposed. The wind-borne and water-lain sediments; the massive, mottled deposits; and the moderately abundant artifact density suggest that the structure pit was filled in a variety of manners. The mottled deposits could represent intentional trash deposition mixed with natural decomposition of the structure and natural wind-borne and water-lain sediments. The lack of oxidation and charcoal staining on the floor suggests that the structure did not burn. The two intramural pits contained fill that was more homogeneous than the structure fill and did not contain wind-borne and water-lain deposits, and it may represent a single episode of intentional filling sometime before abandonment.

Stratigraphic Relationships and Associated Features

The stratigraphic position of Feature 13071 provided a date range that corresponded to the Late Archaic to Pioneer period. This was narrowed to the San Pedro phase by the radiocarbon results. The nearest feature was an activity area, Feature 13070, which abutted the western side of the structure (see Appendix A). It may have been an extramural surface that was contemporaneous with the structure.

Intrusive features included two nonthermal pits (Features 13066 and 13067) that were cut into the postabandonment fill on the southeastern edge of the structure (see Figure 85). A later FAR concentration (Feature 2009) was located on the surface of the site, above Feature 13071, and overlay its southeastern corner. Within 10 m of the structure was a fairly dense arrangement of extramural features. Of these, 21 features were in the same stratigraphic unit as Feature 1307 and may have been contemporaneous with it, including Features 13030, 13031, 13032, 13033, 13034, 13037, 13038, 13050, 13051, 13068, 13069, 13070, 13074, 13100, 13575, 16576, and 16603. Features within Unit IIs/sf dated to the Middle to Late Archaic period and were also potentially contemporaneous. These included Features 13035, 13036, 13044, 13045, 13046, 13047, 13048, 13072, 13097, 13098, 13099, 13103, 13104, 13105, 13107, 13108, 13110, 13111, 13121, and 13124.

Feature 18192

Structure type: house-in-pit
Age: San Pedro phase
Locus: Area B
Grid location: H0
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m^2): 3.20
Effective floor area (m^2): 2.50
Orientation: indeterminate
Length (m): 2.30
Width (m): 2.00
Excavated depth (m): 0.24
Volume (m^3): 0.900

Excavation Methods

Feature 18192 was a possible house-in-pit that dated to the San Pedro phase (see Table 10). This structure was identified during mechanical excavation of MSU 18128 (see Appendix A), but the full plan of the feature was exposed by hand-excavation (HSU 20376) (Figure 87). Excavation of MSU 18128 removed most of the fill and exposed portions of the prepared floor surface in the northern portion of the structure, but a baulk was left over the southern portion of the structure to preserve the southern wall and structure fill. A control unit was not excavated, but HSU 20376 was placed over the baulk. Once the feature was completely exposed in plan view, after the excavation of HSU 20376, the structure was divided into two sections (SECs 19156 and 20400). SEC 19156 included the northern portion of the structure that had been mechanically excavated to the prepared floor surface, and SEC 20400 included the southern portion of the structure that still contained a significant quantity of fill.

SEC 20400 was excavated in three levels. Level 1 was excavated through structure fill and was terminated arbitrarily at 0.12 m in depth. Level 2 was excavated through floor fill and ended upon exposure of a prepared upper floor surface, designated Floor 2. A hearth (Subfeature 19147) originated at the surface of Floor 2. Level 3 of SEC 20400 was used to remove Floor 2 in the southern portion of the structure. Level 1 of SEC 19156 removed Floor 2 in the northern portion of the structure. Removal of the 0.14-m-thick Floor 2 surface exposed the natural substrate, designated Floor 1, corresponding to the base of the structure pit.

Feature Fill

Two strata were present above Floor 2. The uppermost stratum, corresponding to the structure fill, consisted of a slightly hard, yellowish brown sandy loam containing sparse, dispersed charcoal flecking and burned daub. The fill displayed laminated sediments consistent with aeolian and alluvial deposition. A single piece of flaked stone debitage was present within the unit that represented the upper stratum (SEC 20400, Level 1).

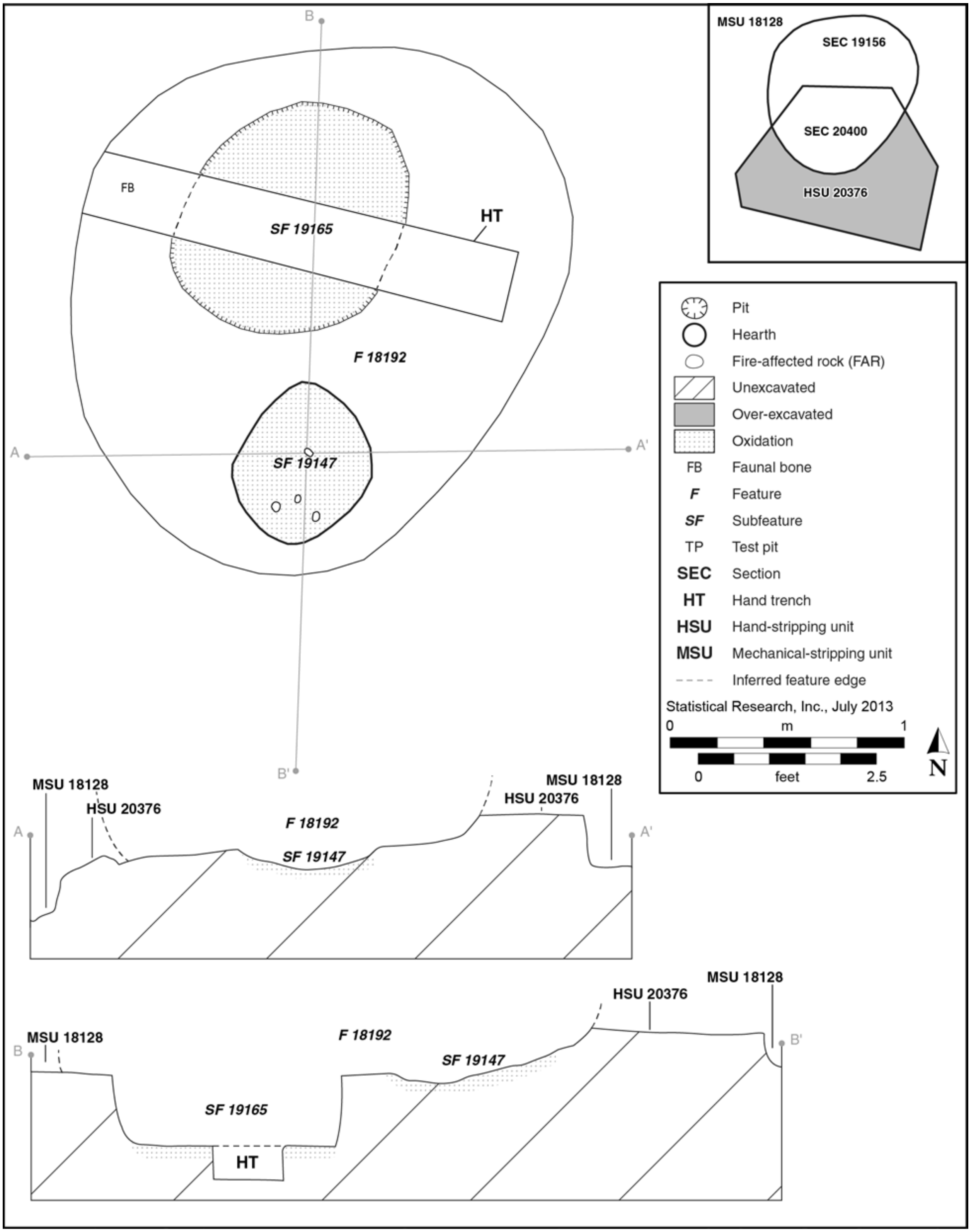

Figure 87. Post-excavation plan view and cross sections of Feature 18192 (a structure) at Falcon Landing.

The lower stratum, corresponding to the structure-floor fill, consisted of a moderately compact, yellowish brown sandy loam containing abundant charcoal, oxidized daub, and charred posts. This architectural debris was in contact with Floor 2. Artifacts within the unit that represented the lower stratum (SEC 20400, Level 2) included six unworked faunal bones and five pieces of flaked stone debitage (see Table 10). Charcoal obtained from the lower stratum (SEC 20400, Level 2) was submitted for further analysis (see Chapter 6, Volume 2).

Construction Details

Walls and Roof

Feature 18192 was built either in or around a circular pit that was at least 0.24 m in depth. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. Burned posts and daub found in the structure fill indicate a wattle-and-daub superstructure (Figure 88).

Floor

Two floors were present in Feature 18192. The upper floor (Floor 2) consisted of a 0.14-m-thick, hard, yellowish brown sandy clay that was used to prepare a mud-plastered surface. A cluster of five unworked faunal-bone fragments, patches of oxidation, and a hearth (Subfeature 19147) were found on Floor 2 (see Figure 87). Removal of Floor 2 (SEC 19156, Level 1, and SEC 20400, Level 3) resulted in the recovery of six additional faunal bones and three pieces of flaked stone debitage. Floor 1 was identified below and consisted of the natural substrate. No artifacts, charcoal, ash, or oxidation was identified on Floor 1, but one large intramural pit (Subfeature 19165) originated at that surface. A pollen sample from Floor 1 was submitted for analysis (see Chapter 7, Volume 2).

Figure 88. Mid-excavation photograph of Feature 18192, view to the south. The part of the feature in the foreground shows the floor of the structure (outlined in spray-paint).

Entry
No entryway was discernible.

Interior Features
Two intramural features were identified in Feature 18192: a hearth (Subfeature 19147) originating in Floor 2 and a thermal pit (Subfeature 19165) originating in Floor 1 (Table 34; see Figure 87). The hearth consisted of a shallow, unlined depression within Floor 2. It was basin shaped in cross section and measured 0.10 m in depth, and in plan view, it was circular and measured 0.70 m in diameter. The feature was excavated in one stratigraphic unit and level. The fill consisted of white-gray ash interpreted as representing the final use of the hearth. Four pieces of FAR were present, but no additional artifacts were found there.

Subfeature 19165 was a large thermal pit with an oxidized base and a 0.08-m-thick rind of mud plaster on the upper pit walls. It was basin shaped in cross section and measured 0.27 m in depth. In plan view, it was circular and measured 1.10 m in diameter. The pit was excavated in one stratigraphic unit and level, but an exploratory HT was excavated through the base of the feature prior to excavation (see Figure 87). The pit fill was a homogeneous yellowish brown silt clay loam containing a moderate amount of dispersed charcoal flecking and small, oxidized daub fragments. A single piece of unworked faunal bone was also present. The base of the pit consisted of the natural substrate and was heavily oxidized. The mud plaster was not oxidized and appeared to have been placed on the upper pit walls after the oxidation of the pit base.

Evidence of Remodeling
Feature 18192 had evidence of a single remodeling episode. The original structure was built within an unprepared earthen pit. A large thermal pit (Subfeature 19165) was associated with that earthen surface. Later, a mud-plastered floor was placed over both the earlier, unprepared earthen surface and the intramural pit. A second, smaller hearth (Subfeature 19147) was used on the upper floor surface. The structure later burned and was abandoned.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 18192 originated at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the surface of Unit IIA and Unit IV provides a geochronologic date of ca. 2420 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis
A charred fragment of mesquite (*Prosopis* sp.) wood was recovered from the fill above Floor 2 (SEC 20400, Level 2) and submitted to Aeon for AMS dating. The charcoal returned a 2σ calibrated date range of 910–810 cal. B.C. (Aeon Sample No. 1493) (see Chapter 2, Volume 2). This date range indicates that the last use of the structure occurred during the San Pedro phase of the Late Archaic period.

Table 34. Intramural Features in Feature 18192 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m³)
Hearth						
19147	circular	basin	0.70	0.60	0.10	0.0420
Thermal pit						
19165	circular	basin	1.10	1.10	0.27	0.3267

Abandonment Processes

Charred posts and oxidized daub in contact with the floor indicate that the structure burned. Laminated sediments consistent with aeolian and alluvial deposition overlay the burned architectural material, indicating that the structure pit filled naturally with alluvial and aeolian sediments after burning. The lack of artifacts in the upper structure fill supports this observation.

Stratigraphic Relationships and Associated Features

Feature 18192 originated on the surface of Unit IIA, overlain by Unit IV deposits, providing an age range of the Middle Archaic to Pioneer period. Radiocarbon results narrowed the dates of the structure to the San Pedro phase of the Late Archaic period. Eighteen extramural features were located within 10 m of Feature 18192, most in a cluster to the south of the structure (see Appendix A). Extramural pits in the same stratigraphic position as the structure included 4 thermal pits (Features 18172, 18173, 18178, and 18181) and 2 nonthermal pits (Features 18182 and 18187). The remaining features in the vicinity either predated or postdated Feature 18192.

Feature 18887

Structure type: house-in-pit
Age: San Pedro phase
Locus: Area A
Grid location: H5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: irregular

Total floor area (m^2): 1.10
Effective floor area (m^2): 0.72
Orientation: indeterminate
Length (m): 2.54
Width (m): indeterminate
Excavated depth (m): 0.18
Volume (m^3): 0.430

Excavation Methods

Feature 18887 was a possible house-in-pit that dated to the San Pedro phase (see Table 10). The structure was identified deep in the southern profile of TR 2213 (see Appendix A). It appeared in profile as a large, irregularly shaped pit containing dispersed charcoal flecking. A 1-by-2-m control unit (TP 20315) was first hand-excavated over the structure profile, off the southern edge of TR 2213 (Figure 89). This unit defined the southern and western extent of the feature in plan view, and a second 0.70-by-1.25-m rectangular control unit (TP 20324) was then placed immediately east to completely expose the eastern edge of the feature in plan view (see Figure 89).

Both control units were excavated in three levels; the first two levels were largely overburden and were considered mixed deposits, and the third level represented only the fill of Feature 18887. Level 1 was terminated arbitrarily at 0.26 m in depth, and Level 2 ended upon exposure of the structure plan. The size and shape of each control unit changed to represent the shape of the structure with the onset of Level 3, and each unit changed to an irregular shape. Level 3 in TP 20315 measured 1.63 by 0.60 m, and Level 3 in TP 20324 measured 0.60 by 0.58 m. TR 2213 truncated the northern portion of the structure (see Figure 89).

Feature Fill

A single stratum was present within the fill of Feature 18887. It consisted of a yellowish brown silty clay loam containing sparse, dispersed charcoal flecking. The fill contained fine laminae consistent with sediment deposited by aeolian and alluvial processes. A single piece of unworked faunal bone was the only artifact found within the structure fill (see Table 10).

Construction Details

<u>Walls and Roof</u>

Feature 18887 was built either in or around a pit that was at least 0.18 m in depth (Figure 90). The shape of the pit was likely ovate, but the northern portion of it was truncated by TR 2213. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition,

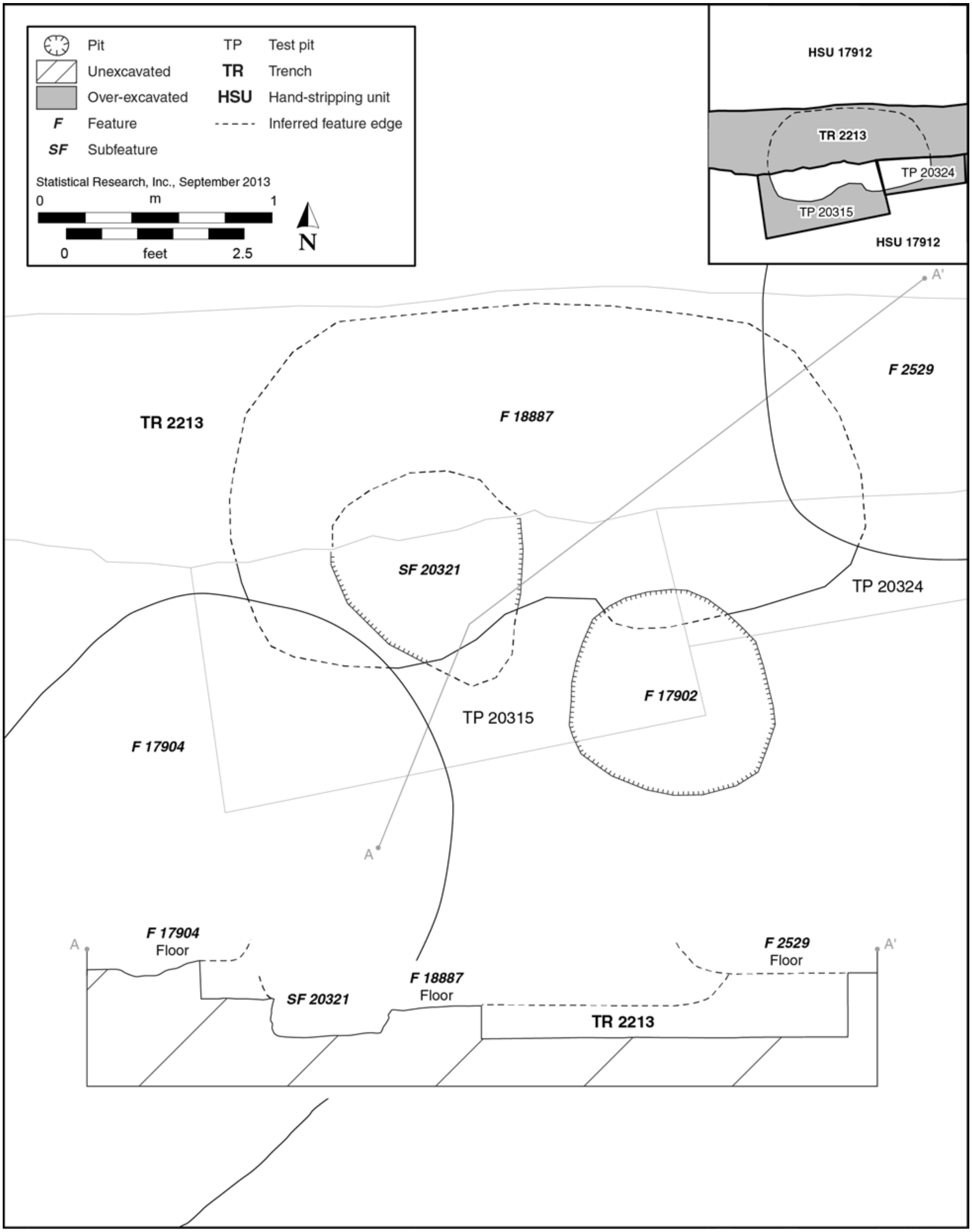

Figure 89. Post-excavation plan view and cross section of Feature 18887 (a structure) and Features 2529 and 17904 (overlying structures) at Falcon Landing. The location of Feature 17902 is also depicted in the plan view.

Figure 90. Photograph of the floor of Feature 18887 (a structure), with Subfeature 20321 in the foreground, view to the south. Note that the remains of the southeastern portion of Feature 17904 (an overlying structure) can be seen in the upper right of the photograph, and the remains of Feature 17902 (an overlying pit) are located off the southeastern edge of TP 20315.

because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor
The floor of the structure consisted of the natural substrate. It did, however, display noticeable use compaction and small, localized patches of oxidization in the eastern portion of the structure. No artifacts were in contact with the floor.

Entry
No entryway was discernible.

Interior Features
A single intramural pit (Subfeature 20321) originated at the structure floor (see Figure 89). The pit was unburned and bell shaped in cross section and measured 0.23 m in depth. It was irregularly shaped in plan view, and its northern end was removed by TR 2213, but it measured at least 0.80 m in diameter. Subfeature 20321 was excavated in one stratigraphic unit and level. The pit was filled with the same yellowish brown silty clay loam that was present in the structure pit, and the sediments displayed fine bedding indicative of aeolian and alluvial infilling. It contained no artifacts, but sparse charcoal flecking was present throughout. Charcoal from the fill of Subfeature 20321 and a pollen sample from the base were submitted for further analyses (see Chapters 6 and 7, Volume 2).

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 18887 was located at or near the surface of Unit IIs/sf, with late Holocene alluvial-fan deposits (Unit III2cf) overlying it. The unconformity between the Unit IIs/sf surface and Unit III2cf provides a geochronologic date of ca. 790–160 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A fragment of mesquite (*Prosopis* sp.) charcoal recovered from the fill of Subfeature 20321 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 1120–1000 cal. B.C. (Aeon Sample No. 1494) (see Chapter 2, Volume 2), which places the use of the structure in the San Pedro phase of the Late Archaic period.

Abandonment Processes

The lack of artifacts in contact with the structure floor suggests that the structure was cleaned prior to abandonment. The structure fill was indicative of wind-borne and water-lain deposits and possessed no evidence of structural debris. Additionally, the single intramural pit was filled with deposits similar to those in the structure pit, suggesting that the structure may have been dismantled upon abandonment. The relatively small amount of charcoal and the lack of architectural debris in the structure fill, as well as minimal oxidation and charcoal staining on the floor, indicate that the structure did not burn. A few small patches of oxidized sediment were found on the structure floor but, based on their localization, are interpreted as resulting from the use of the structure. It appeared that the structure had been left to infill naturally after abandonment, without intentional debris disposal.

Stratigraphic Relationships and Associated Features

Feature 18887 originated at the surface of Unit IIs/sf and was radiocarbon dated to the San Pedro phase. The structure was overlain by several pits and structures that postdated Feature 18887 and were constructed during the Late Cienega to Red Mountain phase (Figure 91). These included three structures (Features 2529, 17904, and 17908), two nonthermal pits (Features 2530 and 17902), and a thermal pit (Feature 17907) (see Figure 89 for the locations of Features 2529, 17908, and 17904; also see Appendix A). Other nearby features included a structure (Feature 14702) to the south and an activity area (Feature 14729) to the east. No other San Pedro phase features were within 10 m of the structure.

Late Archaic to Pioneer Period Component

Feature 10615

Structure type: house-in-pit
Age: Late Archaic to Pioneer period
Locus: Area A
Grid location: I4
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 4.18
Effective floor area (m^2): 4.18
Orientation: indeterminate
Length (m): 2.78
Width (m): 2.13
Excavated depth (m): 0.59
Volume (m^3): 2.670

Excavation Methods

Feature 10615 was a possible house-in-pit dating sometime between the Late Archaic to Pioneer period (see Table 10). The structure was discovered during mechanical excavation of MSU 10588 in the northern part of the site (see Appendix A). The feature was initially thought to be an extramural pit; therefore, no control unit was excavated. The feature was bisected, with SEC 13494 to the north and SEC 14195 to the south (Figure 92). Each section was removed in a single level. SEC 13494 was screened through 1/4-inch mesh, and SEC 14195 was not screened.

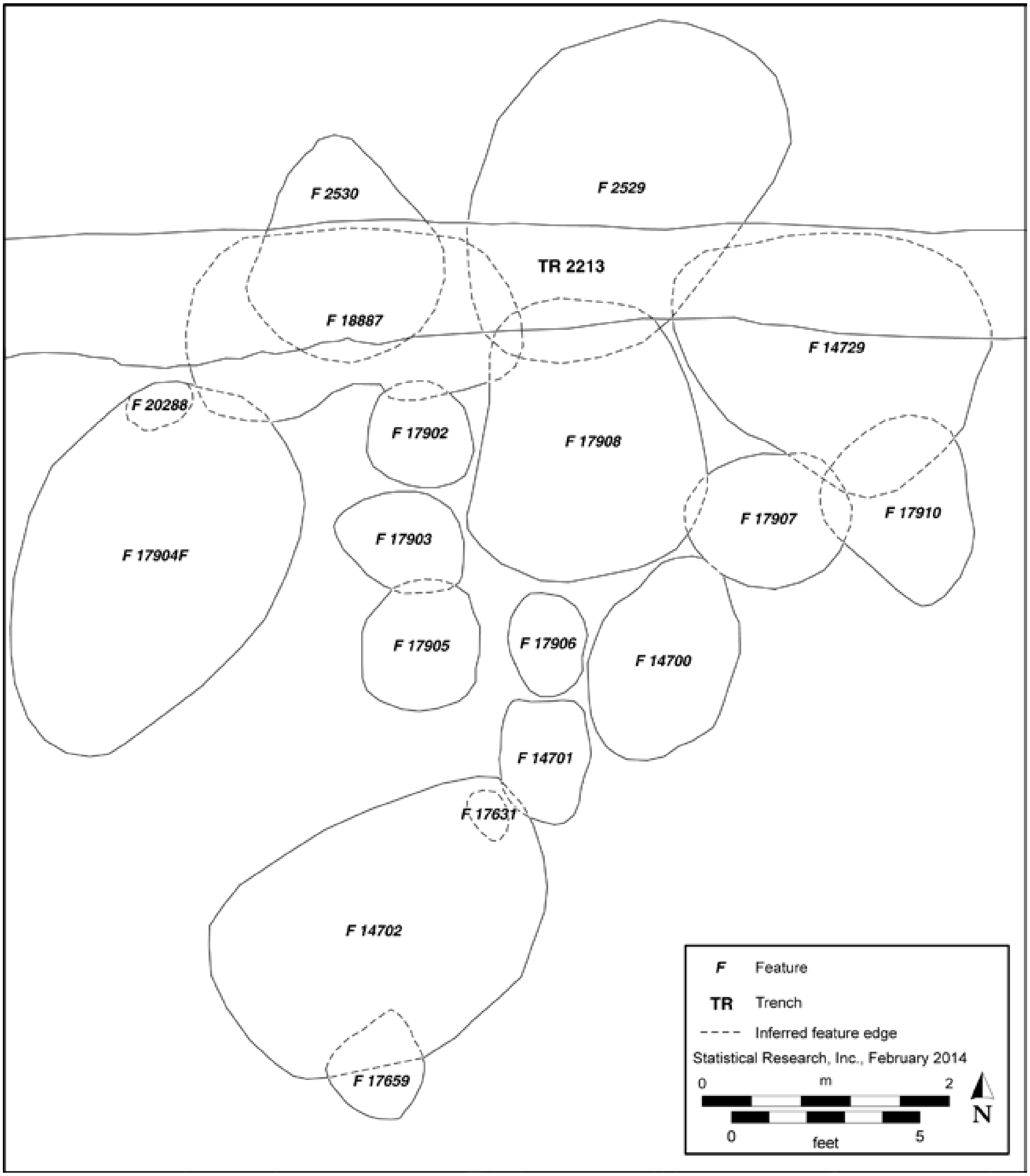

Figure 91. Plan view map of a dense concentration of features at Falcon Landing, including five house-in-pit structures (Features 2529, 14702, 17904, 17908, and 18887), an activity area (Feature 14729), and several extramural pits (these features are located in Grid H5; see Appendix A).

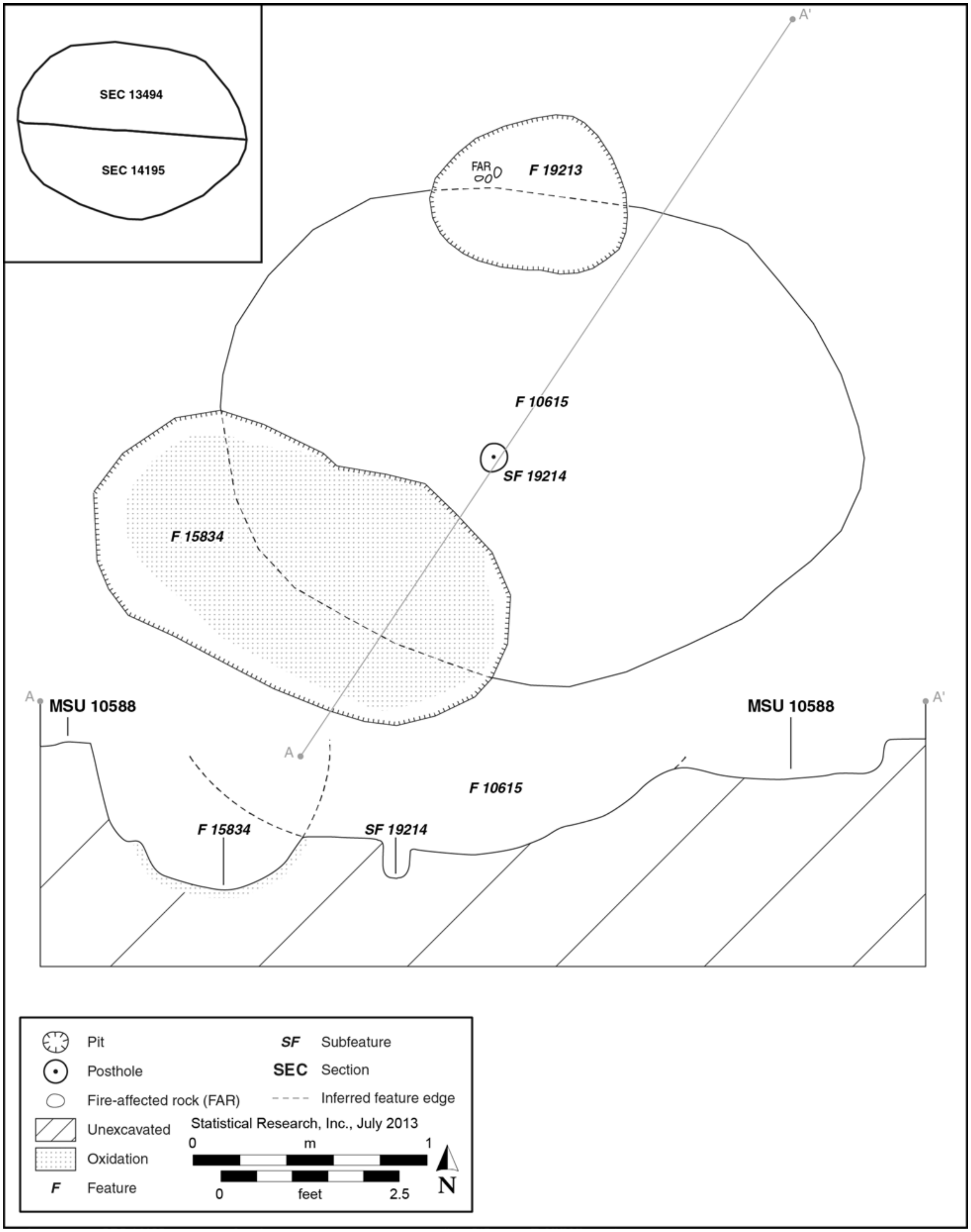

Figure 92. Post-excavation plan view and cross section of Features 10615 (a structure) and 15834 (an intrusive pit) at Falcon Landing. The location of Feature 19213 (another intrusive pit) is also shown in the plan view.

Feature Fill

The single stratum of feature fill was a homogeneous, slightly hard light brown silt loam. Large pieces of charcoal, some up to 3 cm in diameter, were present throughout the fill. Artifacts recovered from the structure fill included 1 projectile point fragment, 1 biface, 1 edge-modified flake, 1 mano fragment, 1 metate fragment, 5 indeterminate ground stone fragments, 150 pieces of flaked stone debitage, 131 pieces of FAR, and 30 pieces of unworked faunal bone (see Table 10).

Construction Details

Walls and Roof

Feature 10615 was built either in or around a 0.59-m-deep ovate pit (Figure 93). Whether the structure was in or surrounding the pit was impossible to interpret, because only a single intramural posthole (Subfeature 19214) was identified, and it was located in the center of the structure (see Figure 92). No other architectural elements were found. Feature 10615 was much deeper than other structures on the site, and it is possible that instead of a structure, it could have been a very large, nonthermal, trash-filled pit.

Floor

The floor of the structure consisted of the natural substrate. Artifacts were not in contact with the floor.

Entry

No entryway was identified.

Interior Features

None.

Figure 93. Photograph of the floor of Feature 10615 at Falcon Landing, view to the west.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
The projectile point was a distal fragment and therefore could not be assigned to a specific typology.

Geochronologic Analysis
Feature 10615 originated at or near the surface of Unit IIs/sf, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between Unit IIs/sf and Unit IV provides a geochronologic date range of ca. 790 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Pioneer period.

Radiocarbon Analysis
None.

Abandonment Processes
Although there were large amounts of charcoal and FAR, the structure did not appear to have burned. No oxidation or charcoal was noted on the floor. The artifacts and burned material were probably deposited in the structure after its abandonment but during occupation of the site.

Stratigraphic Relationships and Associated Features
The geochronologic date range of the structure corresponded to the Late Archaic to Pioneer period. Associated features included an intrusive thermal pit, Feature 15834, in the southwestern corner of Feature 10615 (see Figure 92). The date ranges of these features are identical, and a more specific date could not be determined for the intrusive, and presumably later, pit. Another pit, Feature 19213, intruded into the northern edge of structure Feature 10615 (see Figure 92).

In the immediate area of Feature 10615, and possibly associated with it, lay a number of evenly distributed nonthermal pits and a large activity area (see Appendix A). The activity area, Feature 10599, was located 6.5 m to the north and appeared to predate the structure. Neighboring extramural pits from the Middle to Late Archaic period included Features 10608, 10609, 10610, 10620, 10628, and 18880. Extramural pits in the same stratigraphic unit as Feature 10615 included Features 10606, 10613, 10618, and 10622. The remaining features in the area were geochronologically dated to a broad time span that encompasses the Late Archaic to Protohistoric period; these include Features 10604, 10605, 10607, 10612, 10614, and 10619.

Cienega Phase Component

Feature 1413
Structure type: house-in-pit
Age: Cienega phase
Locus: Area B
Grid location: A4
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m²): 5.68
Effective floor area (m²): 5.68
Orientation: indeterminate
Length (m): 3.00
Width (m): 2.40
Excavated depth (m): 0.24
Volume (m³): 1.470

Excavation Methods
Feature 1413 was a possible house-in-pit that dated to the Cienega phase of the Late Archaic period (see Table 10). The structure was identified during mechanical excavation of MSU 1288 as a large, circular stain (see Appendix A). A 1-by-2-m control unit (TP 5566) was first excavated near the center of the stain. The

remainder of structure fill was then excavated in three sections (SECs 5587, 5620, and 5641) (Figure 94). Excavation of all the control units and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. TP 5566 and SECs 5587 and 5620 were excavated in two levels. Level 1 was terminated arbitrarily at approximately 0.10 m in depth. Level 2 ended at the structure floor. After the excavation of SEC 5620, it was noted that cultural fill still existed to the west. SEC 5641 was placed in that area and excavated in one level, to the floor (see Figure 94).

Feature Fill

Two strata were present within Feature 1413. The upper stratum was limited to the very center of the feature and was around 0.05 m thick. It was a soft, red-brown silty loam that contained bedding consistent with wind-borne and water-lain deposition. Charcoal was dispersed throughout the stratum, and very few artifacts were recovered.

The lower stratum constituted the majority of the structure fill. It was a slightly compacted, pale brown silty loam. Most of the artifacts were collected from that stratum, but they decreased with depth. They included 6 faunal bones, 30 pieces of flaked stone debitage, and the distal portion of an indeterminate projectile point (see Table 10). Two pollen and two macrobotanical samples from both fill and floor-fill contexts were submitted for analyses (see Chapters 6 and 7, Volume 2).

Construction Details

Walls and Roof

Feature 1413 was built in or around a 0.24-m-deep circular pit. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. Because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure (Figure 95).

Floor

The floor of the structure consisted of the natural substrate. It was slightly compacted from use, most notably in the east, where a 0.8-by-1-m area of possible prepared floor surface was identified. No artifacts were in contact with the floor.

Entry

No entryway was discernible.

Interior Features

None.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 1413 was located within Unit III2, the bracketing age range of which is ca. 720–200 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Cienega phase of the Late Archaic period.

Radiocarbon Analysis

None.

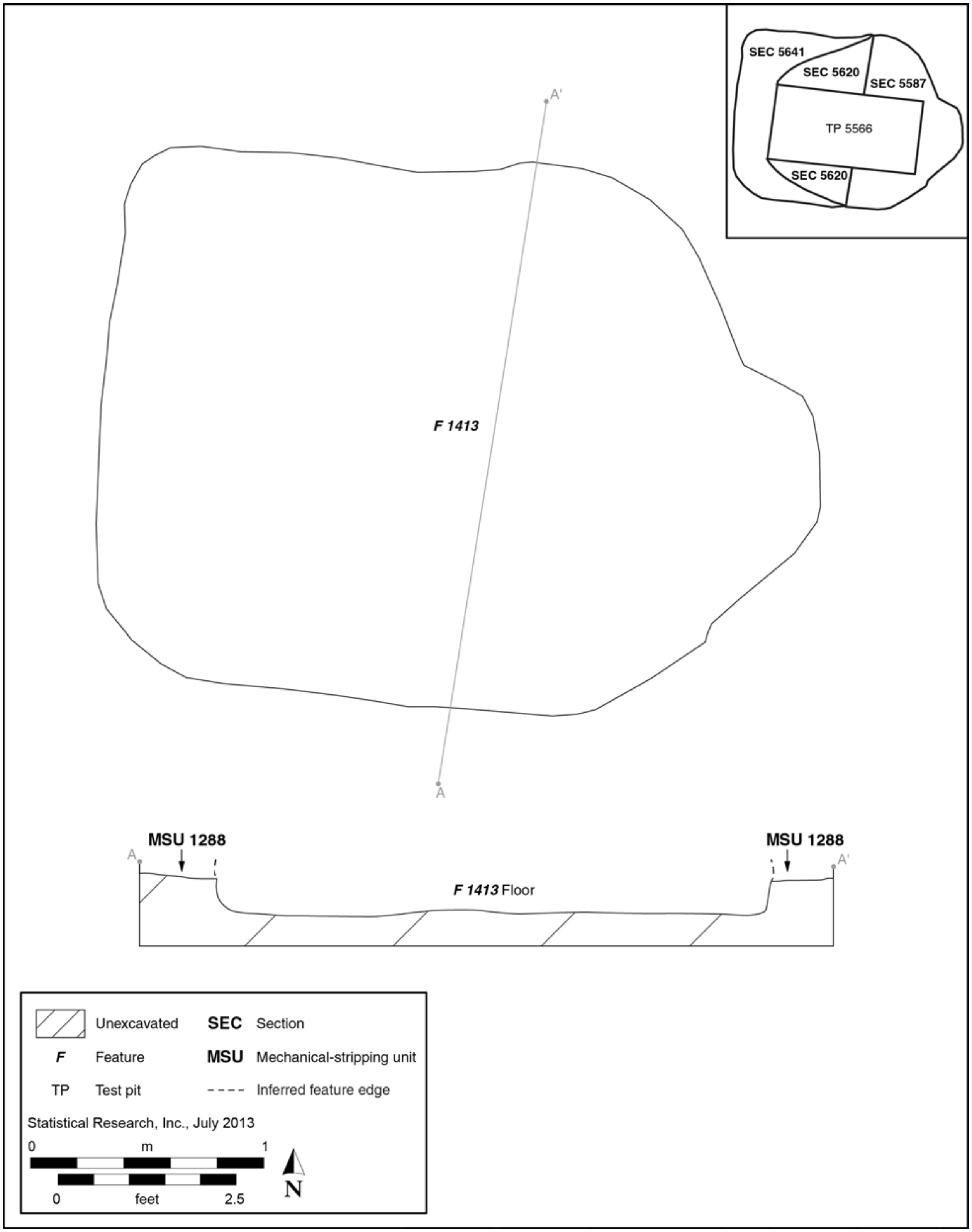

Figure 94. Post-excavation plan view and cross section of Feature 1413 (a structure) at Falcon Landing.

Figure 95. Photograph of the floor of Feature 1413 at Falcon Landing, view to the south.

Abandonment Processes
It appears that after abandonment, the structure was subjected to two phases of infill, both natural and cultural in nature. This interpretation was further supported by the presence of two charcoal- and artifact-laden strata that represented the infilling of the structure by alluvial and aeolian processes as well as by secondary dumping activity. The paucity of charcoal in the structure fill indicates that the structure was not burned at the time of abandonment, and the artifacts observed were likely the results of episodic postabandonment dumping.

Stratigraphic Relationships and Associated Features
Feature 1413 originated within Unit III2, the date range of which corresponds to the Cienega phase of the Late Archaic period. The feature was in close proximity to a number of surrounding pits and features (see Appendix A). Less than 0.5 m to the west of the structure was an ash lens, Feature 1350. It shared a stratigraphic position with Feature 1413 and may have been contemporaneous. Six other features within 5 m of Feature 1413 were also within Unit III2 and may have been associated: Features 1330, 1348 1349, 1350, 1358, and 1469. Six other extramural pits in the vicinity were located on the Unit III1 surface, underlying III2, and were dated to the San Pedro phase.

Late Cienega Phase Component

Feature 4621
Structure type: surface structure
Age: Late Cienega phase
Locus: Area A
Grid location: K4
Level of effort: complete
Plan-view shape: rectangular
Cross-sectional shape: basin
Total floor area (m^2): 10.56
Effective floor area (m^2): 9.91
Orientation: indeterminate
Length (m): 4.12
Width (m): 3.36
Excavated depth (m): 0.27
Volume (m^3): 3.650

Excavation Methods

Feature 4621 was a Late Cienega phase surface structure (see Table 10). The feature was a series of postholes discovered during mechanical excavation of MSU 4580 (see Appendix A). Once several postholes had been identified, a small amount of overburden was left on top of the feature to be hand-excavated at a later time. HSU 6952 was placed over the area and was excavated arbitrarily to the elevation at which the postholes were first discovered. Next, a 1-by-2-m control unit (TP 6753) was placed in the approximate center of the structure and was excavated in a single stratigraphic level, to the structure surface. An intrusive pit (Feature 6846) was identified during the excavation of TP 6753 and was also excavated. The remaining sediment above the structure surface was then hand-excavated in a single unit and stratigraphic level (Figure 96).

Feature Fill

Two distinct strata were seen and excavated in the area of this structure. The upper stratum was limited to a depression in the northwestern corner of the structure. It consisted of a compact, laminated, pale brown silty-sand and may have been the result of animal burrowing or a wear pattern from use of the floor. The lower stratum was present throughout the remainder of the structure. It was a soft sandy loam with ash and charcoal. Artifacts in the deposits above the surface included nine pieces of faunal bone, two indeterminate ground stone fragments, two pieces of flaked stone debitage, and three pieces of FAR (see Table 10). Pollen and macrobotanical samples from Level 2 were submitted for further analyses (see Chapters 6 and 7, Volume 2).

Construction Details

Walls and Roof

Fifteen postholes were the only structural elements of the feature (Table 35). The postholes were arranged in a rectangular shape, and there was no evidence of a structure pit (Figure 97; see Figure 96). The average posthole diameter was 0.22 m, and the average depth was 0.2 m. The 4 corner postholes (Subfeatures 6818, 6828, 6834, and 6982) were larger than average and had diameters ranging from 0.23 to 0.43 m and depths ranging from 0.1 to 0.73 m. Two other larger-than-average postholes (Subfeatures 6826 and 6916) were located near the southeastern and northwestern corners of the structure, respectively. The structure is characterized as a ramada and was likely constructed on the aboriginal ground surface. So, it likely did not have enclosed walls. The posts likely supported a flat brush-and-grass roof. Five of the postholes (Subfeatures 6826, 6828, 6830, 6832, and 6834) contained charcoal in their fill, and Subfeature 6828 contained a piece of faunal bone.

Floor

The surface of the structure consisted of compacted natural sediments. It was identified by an abrupt change from the overlying deposits to a blockier, more compact substrate. A large depression was located in the northwestern portion of the structure and appeared to follow the wall line. It may have been the result of animal burrowing or a wear pattern from use of the floor. No artifacts were found in contact with the surface.

Entry

No entryway was noted during the excavations. It is possible that a preferred entry and subsequent area of use may be shown in the wear pattern in the northwestern corner of the structure.

Interior Features

No intramural pits were observed.

Evidence of Remodeling

No obvious evidence of remodeling was found; however, a large posthole (Subfeature 6826) located near the southeastern corner of the structure (see Figure 96) may be evidence of reinforcement of the southeastern corner post or roof.

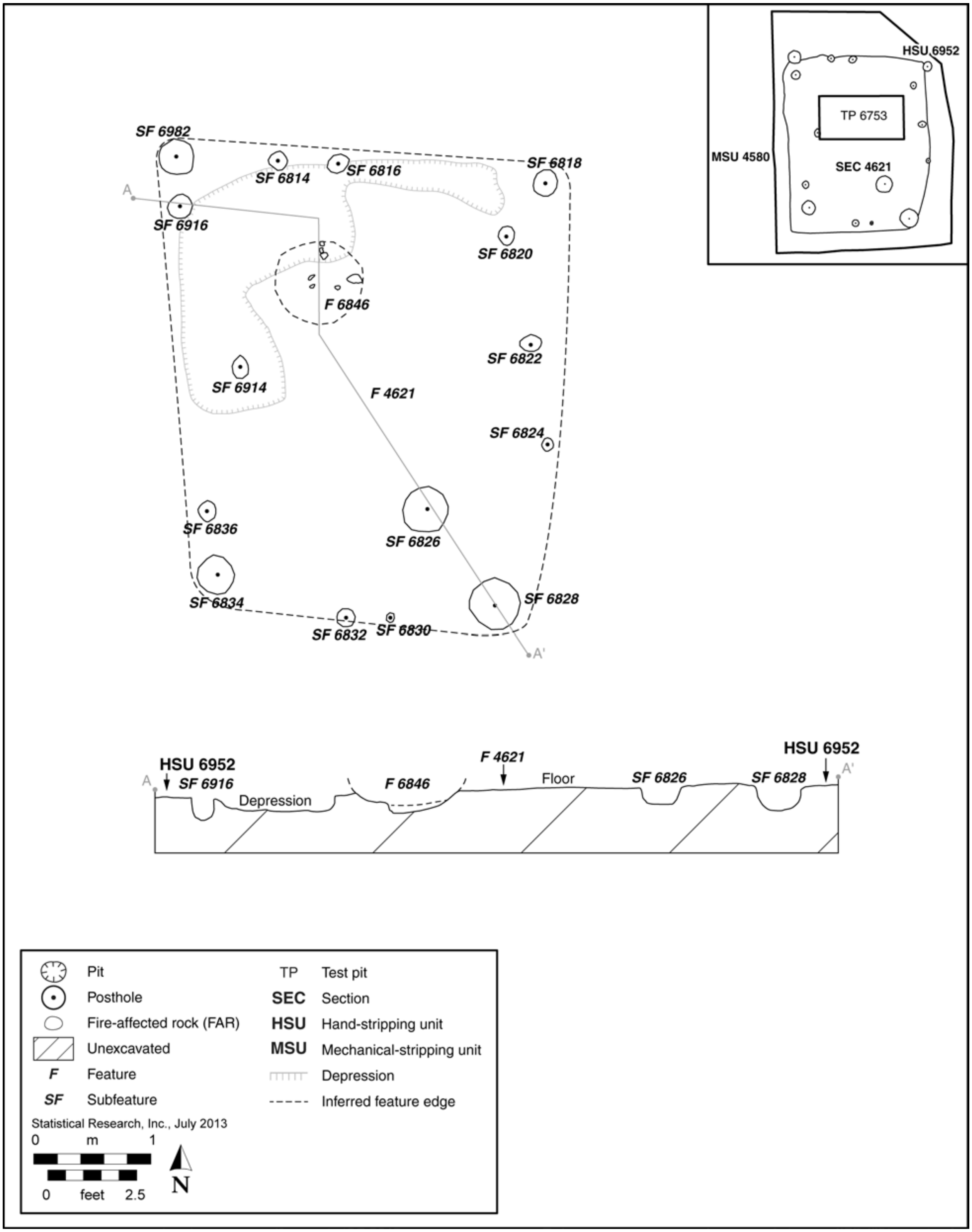

Figure 96. Post-excavation plan view and cross section of Features 4621 (a structure) and 6846 (an intrusive pit) at Falcon Landing.

Table 35. Intramural Features in Feature 4621 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Posthole						
6814	circular	cylindrical	0.16	0.14	0.10	0.0022
6816	circular	cylindrical	0.18	0.16	0.06	0.0017
6818	circular	cylindrical	0.25	0.23	0.10	0.0058
6820	circular	cylindrical	0.16	0.13	0.17	0.0035
6822	circular	cylindrical	0.18	0.14	0.07	0.0018
6824	circular	cylindrical	0.12	0.10	0.06	0.0007
6826	circular	cylindrical	0.39	0.34	0.36	0.0477
6828	circular	cylindrical	0.43	0.42	0.36	0.0650
6830	circular	cylindrical	0.09	0.08	0.09	0.0006
6832	circular	cylindrical	0.15	0.14	0.21	0.0044
6834	circular	cylindrical	0.34	0.32	0.73	0.0794
6836	circular	cylindrical	0.17	0.16	0.11	0.0030
6914	circular	cylindrical	0.16	0.15	0.13	0.0031
6916	circular	cylindrical	0.26	0.20	0.14	0.0073
6982	circular	cylindrical	0.31	0.30	0.24	0.0223

Figure 97. Photograph of the floor of Feature 4621 at Falcon Landing, view to the east.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 4621 originated at or near the surface of Unit IIA, with Unit V deposits overlying it. The unconformity between Unit IIA and Unit V provides a geochronologic date range of ca. 2420 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2).

Radiocarbon Analysis
A piece of burned mesquite (*Prosopis* sp.) wood from a posthole (Subfeature 6828) was submitted to Aeon for AMS analysis. The charcoal returned a 2σ calibrated date of 390–200 cal. B.C. (Aeon Sample No. 1484). This date range corresponds to the Late Cienega phase of the Late Archaic period (see Chapter 2, Volume 2).

Abandonment Processes
Feature 4621 appeared to have been covered with natural sediments after abandonment. The lower stratum of fill contained a small number of artifacts that may have accumulated in the structure through natural processes. Some of the postholes also contained charcoal that may have been introduced from other activities on the site. The upper stratum was a layer of wind-blown sediment that was mostly confined to the northwestern corner of the structure. Following the natural deposition of sediments, a nonthermal pit (Feature 6846) was excavated into the fill of the surface structure.

Stratigraphic Relationships and Associated Features
Feature 4621 originated on the surface of Unit IIA. A radiocarbon result narrowed the date range to the Late Cienega phase. An intrusive nonthermal pit, Feature 6846, was located in the northwestern quadrant of the structure, having been dug into the sandy fill of Feature 4621 after abandonment (see Figure 96). Few potentially contemporaneous pits were located in the area around Feature 4621 (see Appendix A). These included Features 4607, 4611, 4612, 4614, and 4616, all of which had dates in a wide range corresponding to the Middle Archaic to Protohistoric period.

Late Cienega to Red Mountain Phase Component

Feature 2529
Structure type: house-in-pit
Age: Late Cienega to Red Mountain phase
Locus: Area A
Grid location: H5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin
Total floor area (m^2): 4.22
Effective floor area (m^2): 4.22
Orientation: indeterminate
Length (m): 3.26
Width (m): 2.40
Excavated depth (m): 0.24
Volume (m^3): 0.320

Excavation Methods
Feature 2529 was a possible house-in-pit that dated to the Late Cienega to Red Mountain phase (see Table 10). The structure was identified during Phase 1 investigations in the northern and southern profiles of TR 2213. The feature was further defined in plan view by the mechanical stripping of MSU 14668 and then by HSU 17912 (see Appendix A). In plan view, the structure appeared as a large, ovate, organic stain that contained FAR, ground stone, and charcoal. A 1-by-1-m control unit (TP 20281) was first hand-excavated near the center of the stain, and the remaining structure fill was manually removed in two sections

(SECs 20307 and 20309) (Figures 98 and 99). The southern boundary of Feature 2529 was unclear, and it was thought to have been removed by TR 2213; however, during excavation of SEC 18697 in nearby a structure (Feature 17908), the pit edge of Feature 2529 became apparent. This excavation revealed that the southern portion of the structure had been truncated by the northern end of Feature 17908.

Excavation of all the units ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. TP 20281 was excavated in three levels. Levels 1 and 2 terminated at a depth of approximately 0.10 m, and Level 3 ended at the structure floor. SECs 20307 and 20309 were excavated in one level.

Feature Fill

A single stratum was present in Feature 2529 (see Figure 98). It was a hard, yellowish brown silty clay loam containing laminated sands, sparse charcoal, oxidized sediments, and abundant artifacts that decreased with depth. Minor plant and insect disturbances were also observed.

The artifacts included 9 pieces of unworked faunal bone, 1 freshwater-snail-shell fragment, 59 pieces of FAR, 12 pieces of flaked stone debitage, 1 cobble-mano fragment, and 1 metate fragment (see Table 10). The cobble-mano fragment was point-located within the feature fill, in the profile of TR 2213 (see Figure 98). A macrobotanical sample obtained from the floor fill was submitted for species identification (see Chapter 6, Volume 2) and subsequent radiocarbon analysis (see the Radiocarbon Analysis section, below).

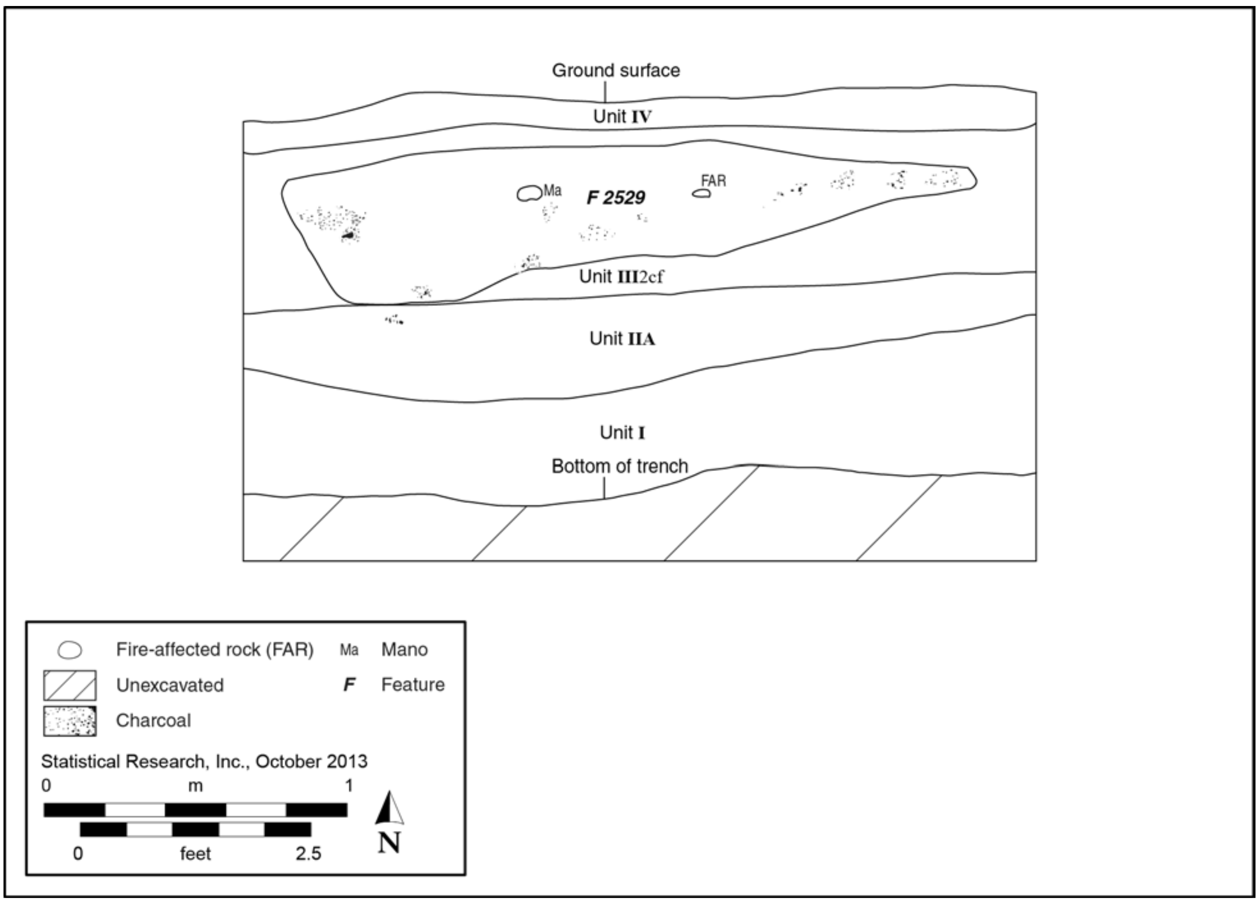

Figure 98. Profile of Feature 2529 (a structure), in the northern face of TR 2213, at Falcon Landing.

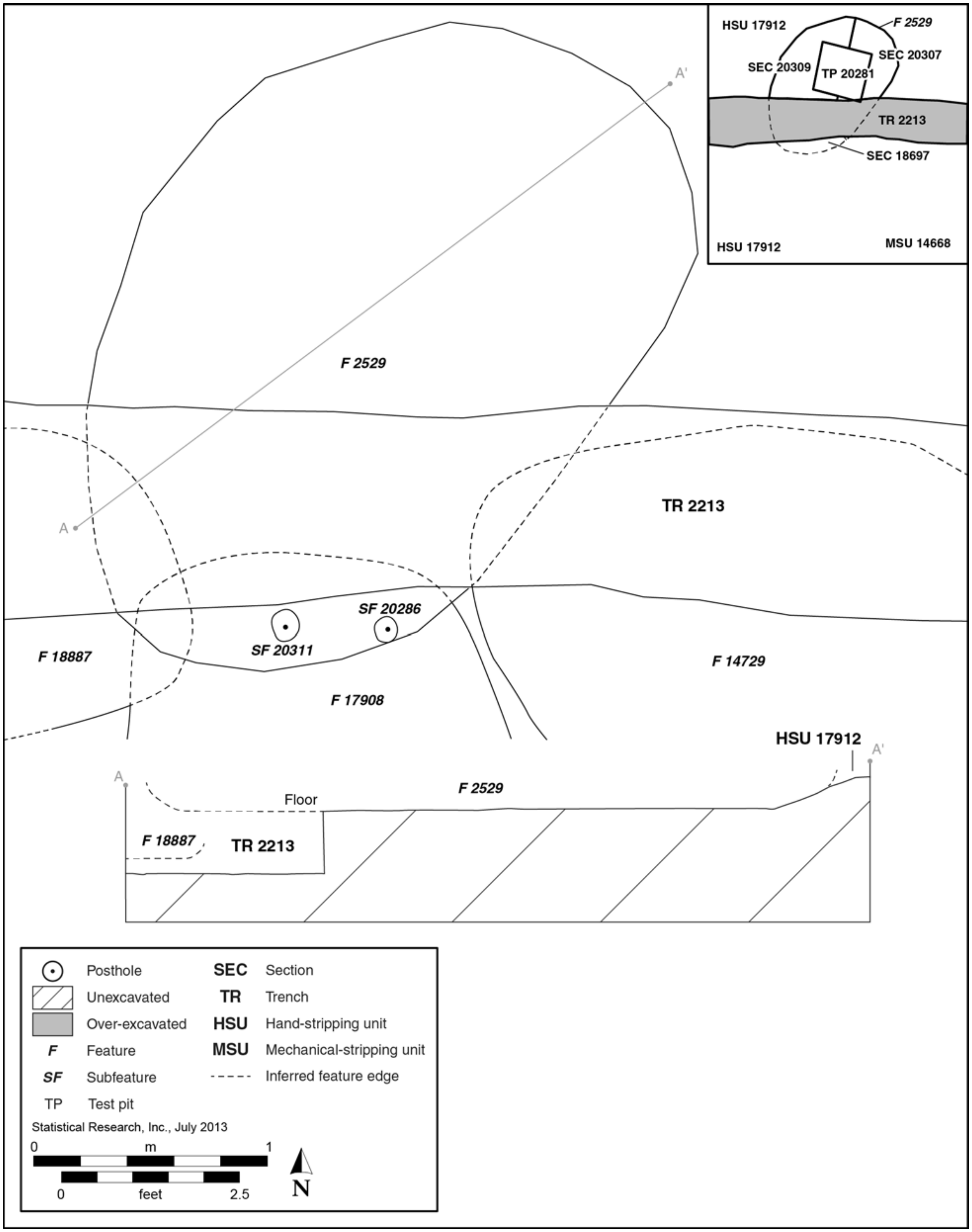

Figure 99. Post-excavation plan view and cross section of Feature 2529 (a structure) and underlying Feature 18887 (a structure) at Falcon Landing. The relationship between Features 14729 (an activity area) and 17908 (a structure) is also shown in the plan view.

Construction Details

Walls and Roof

Feature 2529 was built either in or around an ovate pit that was at least 0.24 m in depth (Figure 100). Whether the structure was in or surrounding the pit was impossible to interpret, because only two wall postholes were identified (Subfeatures 20286 and 20311) (see Figure 99); their attributes are summarized in Table 36. Because of the absence of additional postholes or architectural debris, little else can be concluded about the actual construction of Feature 2529.

Floor

The floor of Feature 2529 consisted of the natural substrate, which displayed noticeable use compaction. In the southeastern portion of the structure, an oxidized area was observed on the structure floor. No artifacts were found in contact with the surface.

Entry

No entryway was discernible.

Interior Features

None.

Evidence of Remodeling

No evidence of remodeling was present.

Figure 100. Photograph of the floor of Feature 2529 at Falcon Landing, view to the south.

Table 36. Intramural Features in Feature 2529 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Posthole						
20286	circular	irregular	0.14	0.13	0.10	0.0018
20311	irregular	basin	0.20	0.12	0.06	0.0014

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 2529 was located within Unit III2cf (see Figure 98), the bracketing age range of which is ca. 160 cal. B.C.–cal. A.D. 340 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of charred mesquite (*Prosopis* sp.) wood from the floor fill of Feature 2529 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 20 cal. B.C.–cal. A.D. 120 (Aeon Sample No. 1482). This date corresponds to the Late Cienega to Red Mountain phase (see Chapter 2, Volume 2).

Abandonment Processes

The homogeneity in the structural and posthole fill indicates that the structure may have been dismantled at the time of abandonment and minimally infilled sometime later with refuse from other occupational activities at the site. Because of the small amount of charcoal in the structure fill, as well as the absence of extensive oxidation or charcoal staining from the fill and the entirety of the floor, it is evident that this structure did not burn. As stated, the few artifacts found within the structure may have been secondary refuse, but they may also date to periods of structural use. It appears that after abandonment, the fill of the pit structure was infilled by a mixture of cultural and natural processes.

Stratigraphic Relationships and Associated Features

Feature 2529 originated in Unit III2cf, which dated to the Late Cienega to Red Mountain phase (see Figure 98). This was supported by the radiocarbon date, which corresponds to the same temporal period. Feature 2529 slightly overlapped a structure to the south, Feature 17908 (see Appendix A and Figure 99), and Feature 17908 was radiocarbon dated to 160 cal B.C.–cal A.D. 330. The two structures were separated by a thin layer of naturally deposited silt, indicating that Feature 2529 may have represented an immediate reoccupation of the area. By using the radiocarbon date as a limiting factor, this configuration may narrow the date range of Feature 17908 to 160–20 cal. B.C. Several other features within the area all dated, either geochronologically or with radiocarbon analysis, to the Late Cienega to Red Mountain phase (see Figure 91). These included Feature 14702 to the south, Feature 17904 to the southwest, and an activity area, Feature 14729 (see Figure 99). The activity area lay just south of the structure, but because its northern half was removed by a trench, its association with Feature 2529 is unknown. Feature 2529 also overlay structure Feature 18887, a San Pedro phase house-in-pit (see Figure 99). This area of intensive use may represent a household group with shared extramural space.

Fifteen pits that shared the same stratigraphic unit as Feature 2529 were within 10 m of the structure: Features 10724, 10807, 14689, 14700, 14703, 14716, 17901, 17902, 17903, 17905, 17906, 17907, 17910, 17911, and 20288. Most were in a cluster immediately to the south. One pit within the cluster, Feature 14701, was not in the same stratigraphic unit as Feature 2529 and had a long geochronologic date range corresponding to the Early Ceramic to Protohistoric period.

Feature 14702

Structure type: house-in-pit
Age: Late Cienega to Red Mountain phase
Locus: Area A
Grid location: H5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 3.37
Effective floor area (m^2): 2.99
Orientation: southeast
Length (m): 2.95
Width (m): 2.10
Excavated depth (m): 0.14
Volume (m^3): 0.660

Excavation Methods

Feature 14702 was a Late Cienega to Red Mountain phase house-in-pit (see Table 10). The structure was identified during mechanical excavation of MSU 14668 (see Appendix A). Upon identification, it appeared as a large, ovate, organic stain containing dispersed charcoal flecking and FAR. A 1-by-1-m control unit (TP 17617) was first hand-excavated in the northern part of the stain. The remaining structure fill was then manually removed in two portions (SECs 17620 and 17622) (Figure 101).

The control unit (TP 17617) and SECs 17620 and 17622 ended at an upper floor surface (Floor 2), which consisted of a slightly darker, relatively compact, continuous, and hard surface. Because of shallow depth and a lack of stratigraphy, the control unit and the sections were excavated in one level. Following recording and excavation of all subfeatures, Floor 2 and the underlying sediments were removed in one unit and level, to the natural underlying substrate (Floor 1). Additional subfeatures were not identified on that surface.

Feature Fill

Two strata were present within the fill of Feature 14702, including an upper floor fill (Floor Fill 2) and a lower floor fill (Floor Fill 1). The upper floor fill consisted of a 0.09–0.18-m-thick, fairly homogeneous, light yellowish brown silt loam containing sparse, dispersed charcoal flecking, ash, and FAR. It displayed fine laminae consistent with sediment deposited by wind and water. There was no evidence of burned architectural debris in the upper floor fill, and bioturbation was limited to disturbance from large roots that mainly followed the edge of the feature. The lower floor fill was slightly darker than the upper floor fill and consisted of a yellowish brown silty clay containing sparse, dispersed charcoal flecking and FAR. It was uniform in texture and was thought to be a 0.01–0.05-m-thick deposit that represented intentional leveling of the structure floor.

The total count of artifacts within the structure fill was 68 (see Table 10). The upper floor fill contained 5 pieces of unworked faunal bone, 39 FAR fragments, 13 pieces of flaked stone debitage, and 1 complete San Pedro phase dart point. The lower floor fill contained 3 pieces of unworked faunal bone, 3 FAR fragments, and 4 pieces of flaked stone debitage. Charcoal obtained from the upper floor fill (SEC 17622, Level 1) was submitted for further analysis (see Chapter 6, Volume 2).

Construction Details

<u>Walls and Roof</u>

Feature 14702 was built within a 0.14-m-deep ovate pit that measured 2.95 by 2.10 m in plan view (Figure 102). Twelve postholes were identified in association with the structure walls (Table 37). Ten of them lined the interior edge of the structure pit, and 2 were located just outside the structure pit (see Figure 101). The postholes ranged between 0.10 and 0.15 m in diameter and between 0.06 and 0.16 m in depth. All the postholes were generally circular in plan view; half exhibited a cylindrical cross-sectional shape, and the rest exhibited a conical cross-sectional shape. Their fill was a light yellowish brown silt loam, similar to the upper floor fill. One posthole (Subfeature 17634) contained a single piece of flaked stone debitage. None of the postholes contained charcoal flecking or oxidation, and there was no evidence of burned architectural debris in the structure fill. So, little can be said about the construction materials associated with the structure walls and roof.

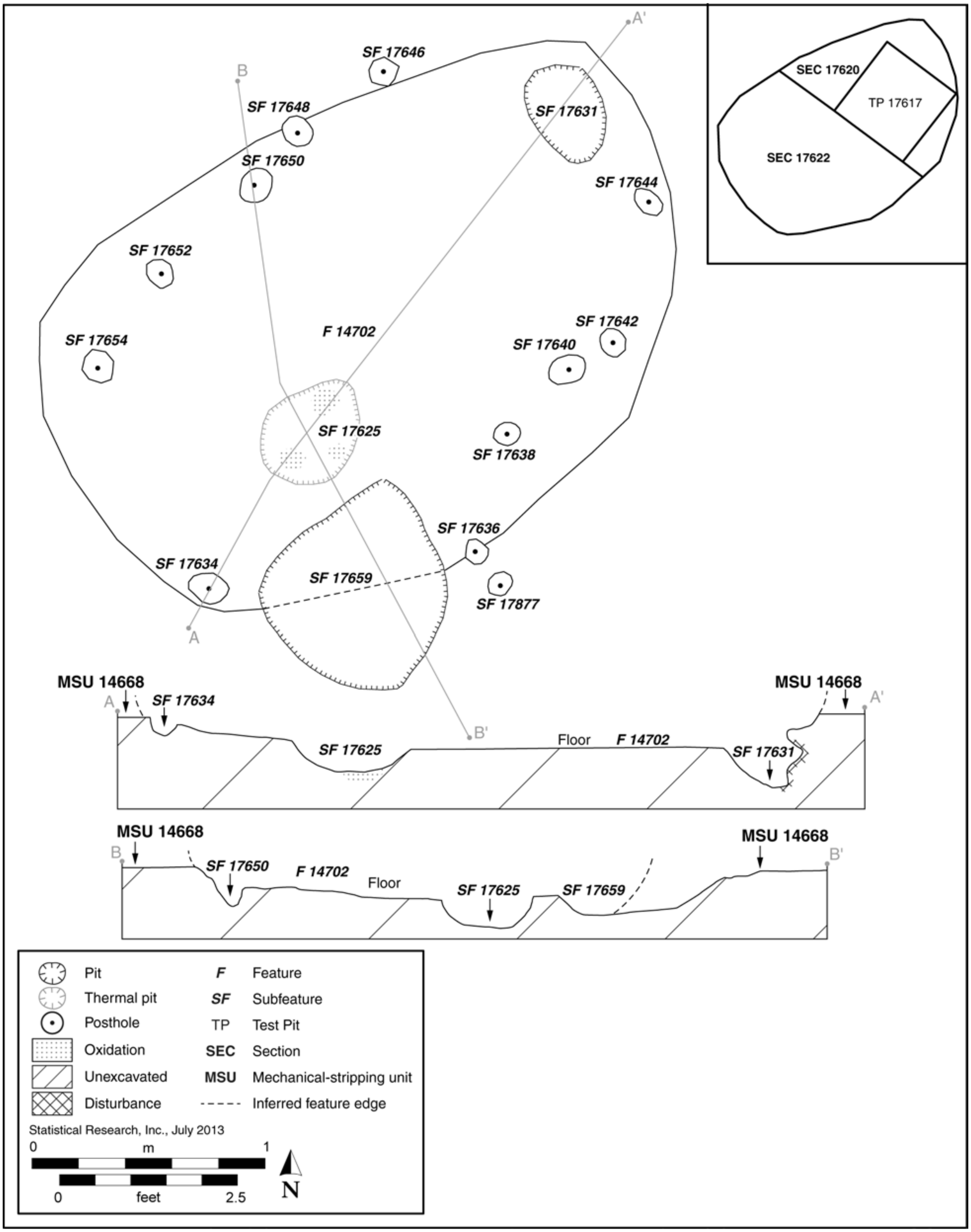

Figure 101. Post-excavation plan view and cross sections of Feature 14702 (a structure) at Falcon Landing.

Figure 102. Photograph of the floor of Feature 14702 at Falcon Landing, view to the north.

Table 37. Intramural Features in Feature 14702 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Thermal pit						
17625	ovate	basin	0.49	0.46	0.13	0.0293
Nonthermal pit						
17631	ovate	basin	0.45	0.32	0.26	0.0374
17659	ovate	basin	1.20	0.75	0.17	0.1530
Posthole						
17634	circular	conical	0.12	0.10	0.06	0.0007
17636	circular	conical	0.13	0.10	0.10	0.0013
17638	circular	cylindrical	0.12	0.12	0.09	0.0013
17640	circular	cylindrical	0.15	0.15	0.16	0.0036
17642	circular	cylindrical	0.13	0.10	0.14	0.0018
17644	circular	conical	0.12	0.11	0.10	0.0013
17646	circular	cylindrical	0.13	0.11	0.10	0.0014
17648	circular	cylindrical	0.15	0.14	0.14	0.0029
17650	circular	cylindrical	0.15	0.13	0.12	0.0023
17652	circular	conical	0.14	0.14	0.09	0.0018
17654	circular	conical	0.14	0.13	0.07	0.0013
17877	circular	conical	0.12	0.10	0.07	0.0008

Floor

Two floors were identified during excavation. The upper floor (Floor 2) consisted of a compact yellowish brown silty clay that appeared to be an intentionally deposited layer of sediment. This deposit was 0.01–0.05 m thick and rested upon the unprepared pit base, which was considered to be the lower floor surface (Floor 1). No artifacts were found in contact with either floor surface, but a pollen sample recovered from the upper surface (Floor 2) was submitted for further analysis (see Chapter 7, Volume 2).

Entry

Based on a gap in the wall postholes and its location and dimensions, Subfeature 17659 may actually represent the remains of a worn entry ramp that opened to the southeast (see Figure 101). The characteristics of Subfeature 17659 are described below.

Interior Features

Three intramural pits were found and excavated within the upper floor (Floor 2) of Feature 14702. They included a thermal pit (Subfeature 17625) and two nonthermal pits (Subfeatures 17631 and 17659) (see Figure 101). All of the pits contained a single stratum consisting of grayish brown silt loam. The fill was darker than the upper floor fill, and the texture was massive, suggesting that the pits were intentionally filled. Pollen and flotation samples were taken from each pit, and remaining fill was screened through 1/4-inch mesh.

The thermal pit (Subfeature 17625) was located in the southern portion of the structure, adjacent to the possible entryway (Subfeature 17659) (see Figure 101). The walls and base were unprepared but patchily oxidized. The pit was basin shaped in cross section and 0.13 m in depth. In plan view, it was ovate and measured 0.49 m in length and 0.46 m in width (see Table 37). Sparse charcoal flecking and ash were present throughout the fill. The pit was excavated in two sections (SECs 17626 and 17628), each containing one level that was terminated at the base of the pit. Artifacts were not present in the pit fill.

Subfeature 17631 was a nonthermal pit located along the northern wall of the structure (see Figure 101). The walls and base of the pit were unprepared and consisted of the natural substrate. The pit was basin shaped in cross section and measured 0.26 m in depth. In plan view, it was ovate and measured 0.45 m in length and 0.32 m in width (see Table 37). Moderate amounts of dispersed charcoal flecking and ash were present throughout the fill. The pit was excavated in a single unit and level, which was terminated at the base of the pit. Four pieces of FAR were present in the pit fill.

Subfeature 17659 was a nonthermal pit located in the southeastern wall of the structure (see Figure 101). As mentioned previously, Subfeature 17659 may represent a worn entry ramp for the structure pit. It could also have been a pit that was accessible from both inside and outside the structure. The walls and base of the pit were unprepared and consisted of the natural substrate. The pit was basin shaped in cross section and measured 0.17 m in depth. In plan view, it was ovate and measured 1.20 m in length and 0.75 m in width (see Table 37). Sparse, dispersed charcoal flecking was present throughout the fill. The pit was excavated in a single unit and level, which was terminated at the base of the pit. Artifacts were not present in the pit fill.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

A complete San Pedro phase dart point dating to ca. 1200 B.C.–A.D. 500 (Sliva 2009) was recovered from the upper floor fill.

Geochronologic Analysis

Feature 14702 was located within Unit III2cf, the bracketing age range of which is ca. 160 cal. B.C.–cal. A.D. 340 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A fragment of mesquite (*Prosopis* sp.) charcoal recovered from just above the upper floor (SEC 17622, Level 1) was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of cal. A.D. 20–120 (Aeon Sample No. 1489) (see Chapter 2, Volume 2). This date range places the use of the structure in the Late Cienega to Red Mountain phase.

Abandonment Processes

The structure fill possessed no evidence of structural debris, and wind-borne and water-lain deposits in contact with the upper floor (Floor 2) suggest that the structure was dismantled upon abandonment. The relatively small amount of charcoal, the lack of burned architectural debris in the structure fill, and the lack of oxidation and charcoal staining on the floor indicate that the structure did not burn. It appears that after abandonment, the structure filled with natural wind-borne and water-lain deposits. Artifacts present in the upper floor fill indicate intentional trash deposition. All of the subfeatures (which originated in Floor 2) were filled with a similar, massive fill that appeared to be associated with the use of the structure.

Stratigraphic Relationships and Associated Features

Feature 14702 originated within Unit III2cf. The date range of this stratigraphic unit corresponds to the Late Cienega to Red Mountain phase. Feature 14702 was surrounded by an intensely used area of extramural pits and structures, many of which originated in the same stratigraphic unit (see Figure 91). The closest was Feature 17908, a house-in-pit possibly contemporaneous with Feature 14702. Feature 17908 may represent an immediate reoccupation of the area, because it was separated from adjacent Feature 2529 by a thin layer of naturally deposited silt (see Figure 99). Several other spatially and temporally related features were within 4 m of Feature 14702. These included three structures (Features 2529, 17904, and 17908) and an activity area (Feature 14729). This area of intensive use may represent a household group with shared extramural space. Another structure, Feature 18887, was also among these features but was located in Unit IIs/sf, underlying Unit III2cf. It was radiocarbon dated to the San Pedro phase, and appears to predate the surrounding features.

Sixteen pits originating within Unit III2cf were within 10 m of Feature 14702: Features 10724, 10807, 14689, 14700, 14703, 14704, 14716, 17901, 17902, 17903, 17905, 17906, 17907, 17910, 17911, and 20288. Most of these pits were in a cluster immediately to the north (see Appendix A).

Feature 17904

Structure type: house-in-pit
Age: Late Cienega to Red Mountain phase
Locus: Area A
Grid location: H5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 2.93
Effective floor area (m^2): 2.57
Orientation: indeterminate
Length (m): 2.20
Width (m): indeterminate
Excavated depth (m): 0.18
Volume (m^3): 0.620

Excavation Methods

Feature 17904 was a possible house-in-pit that dated to the Late Cienega to Red Mountain phase (see Table 10). The structure was identified during mechanical excavation of MSU 14668 (see Appendix A), but only after the western third had been removed (Figure 103). The eastern part of the structure was then further defined by hand-excavation (HSU 17912).

Upon identification, the structure appeared as a large, ovate (truncated), organic stain containing dispersed charcoal flecking and ash. A 1-by-1-m control unit (TP 18574) was first hand-excavated within the center of the stain. The remainder of the structure fill was then manually removed in one section (SEC 18625) (see Figure 103).

The control unit and section ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard surface. Because of shallow depth and lack of stratigraphy, both the control unit and the section were excavated in one level; the depth of TP 18574 was 0.06 m and the depth of

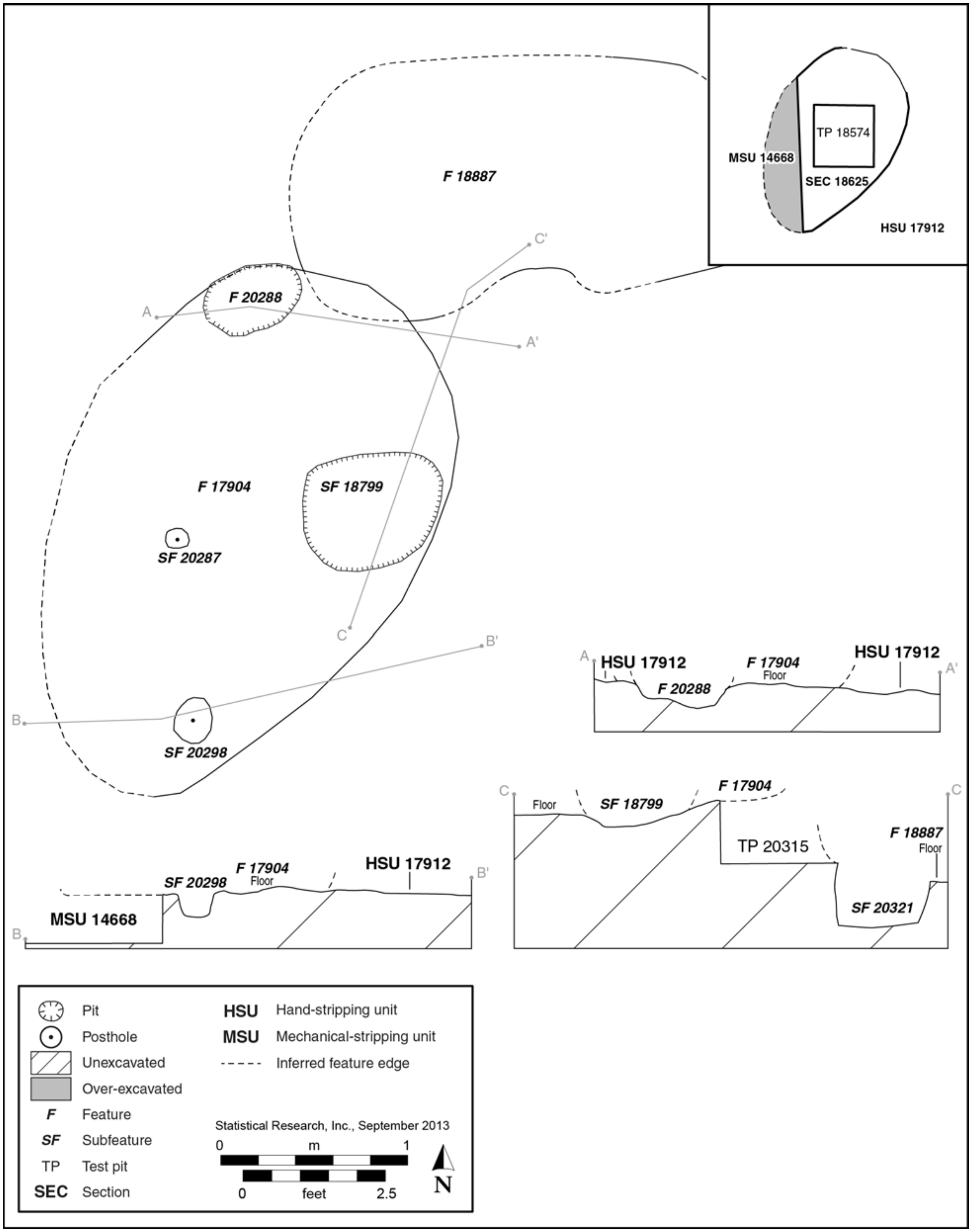

Figure 103. Post-excavation plan view and cross sections of Features 17904 (a structure), 18887 (an underlying structure), and 20288 (an intrusive pit) at Falcon Landing.

SEC 18625 was 0.11 m. Flotation samples were collected from both the control unit and the section. Pollen samples were scraped from the structure floor in both the control unit and the section.

Feature Fill

A single stratum was present within the fill of Feature 17904. It consisted of a yellowish brown silty clay loam containing sparse, dispersed ash and charcoal flecking. No architectural debris was present. The fill displayed laminated sediments consistent with aeolian and alluvial deposition. Minor root disturbance was noted throughout. Artifacts recovered from the structure included 2 pieces of faunal bone, 15 pieces of FAR, and 10 pieces of flaked stone debitage (see Table 10).

Construction Details

Walls and Roof

Feature 17904 was built either in or around a pit that was at least 0.11 m in depth (Figure 104). The pit was likely ovate, but it had been truncated by MSU 14668. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. Two intramural postholes were identified in the floor of the structure; one was located near the center, and the other was near the southern pit wall (see Figure 103). Both were circular in plan view and basin shaped in cross section. They measured between 0.12 and 0.25 m in diameter and between 0.03 and 0.08 m in depth (Table 38). The fill of these intramural postholes was similar to that of the structure fill. Besides the characteristics of the two postholes, little can be said about the structure walls and roof, because no architectural debris was present within the structure fill. Perhaps the lack of wall postholes and architectural debris is indicative of the impermanent nature of the structure.

Figure 104. Photograph of the preserved portion of the floor of Feature 17094 at Falcon Landing, view to the north.

Table 38. Intramural Features in Feature 17904 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
18799	circular	basin	0.65	0.55	0.13	0.0465
Posthole						
20287	circular	basin	0.14	0.12	0.03	0.0005
20298	circular	basin	0.25	0.24	0.08	0.0048

Floor
The floor of the structure consisted of the natural substrate. It did, however, display noticeable use compaction and contained charcoal and ash staining. No artifacts or oxidation was present on the floor.

Entry
No entryway was discernible.

Interior Features
A single intramural pit (Subfeature 18799) originated at the structure floor (see Figure 103). The pit was unburned and basin shaped in cross section and measured 0.13 m in depth (see Table 38). It was circular in plan view and measured 0.65 m in diameter. The pit was excavated in one stratigraphic unit and level. A flotation sample was collected, and the remaining fill was screened through 1/4-inch mesh. A pollen sample was also scraped from the pit base. The pit fill was similar to the structure fill, which was an ashy yellowish brown silty clay loam with evidence of fine wind-borne and water-lain deposits. Artifacts were not present. The lack of artifacts and the presence of wind-borne and water-lain deposits suggest that the pit was infilled naturally.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 17904 originated in Unit III2cf, the bracketing age range of which is ca. 160 cal. B.C.–cal. A.D. 340 (see Chapter 2, Volume 2).

Radiocarbon Analysis
None.

Abandonment Processes
The lack of artifacts in contact with the structure floor suggests that the structure had a planned abandonment. Wind-borne and water-lain deposits in contact with the floor and throughout the fill suggest that the structure may have been dismantled, with the residual pit left open and subsequently filling with naturally deposited sediments. The moderate number of artifacts within the structure fill is also indicative of partial infilling of the structure pit with trash. The relatively small amount of charcoal and the lack of architectural debris in the structure fill, as well as the absence of oxidation on the floor, indicate that the structure did not burn.

Stratigraphic Relationships and Associated Features

Feature 17904 originated within Unit III2cf. The date range of this unit corresponds to the Late Cienega to Red Mountain phase. Feature 17904 was in a cluster of structures and extramural pits, many of which originated in the same stratigraphic unit and are potentially contemporaneous (see Figure 91 and Appendix A). One extramural nonthermal pit (Feature 20288) intruded upon the northern edge of Feature 17904 (see Figure 103). Two other Late Cienega to Red Mountain phase structures existed nearby. The nearest structure was Feature 17908, another house-in-pit 1.5 m to the east. Several other neighboring features within the area all dated, either geochronologically or with radiocarbon analysis, to the Late Cienega to Red Mountain phase. These include three structures (Features 2529, 14702, and 17908) and an activity area (Feature 14729). A San Pedro phase–aged structure (Feature 18887) also underlay Feature 17904 (see Figure 103).

Sixteen pits in Unit III2cf were within 10 m of the structure, including 3 thermal pits (Features 10724, 14700, 17907), a charcoal/ash lens (Feature 14689), and 11 nonthermal pits (Features 10807, 14703, 14704, 14716, 17901, 17902, 17903, 17905, 17906, 17910, and 17911). Most were in a cluster immediately to the east. These features are potentially contemporaneous with the use of Feature 17904, and a few pits with a broader geochronologic date range were located in the area, including 2 nonthermal pits (Features 10725 and 14701) that dated to the Early Ceramic to Pioneer period. This area of intensive use may represent a household group with shared extramural space.

Feature 17908

Structure type: house-in-pit
Age: Late Cienega to Red Mountain phase
Locus: Area A
Grid location: H5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 2.67
Effective floor area (m^2): 2.27
Orientation: indeterminate
Length (m): 2.20
Width (m): 1.82
Excavated depth (m): 0.12
Volume (m^3): 0.360

Excavation Methods

Feature 17908 was a possible house-in-pit that dated to the Late Cienega to Red Mountain phase (see Table 10). The structure was identified during mechanical excavation of MSU 14668 and was further defined by hand-excavation of HSU 17912 (see Appendix A). The northern portion of the structure had been truncated by another structure, Feature 2529 (Figure 105). TR 2213 also removed a small portion of the northern end of the feature. Upon identification, it appeared as a large, semiovate, organic stain containing dispersed charcoal flecking. A 1-by-1-m control unit (TP 18694) was first hand-excavated within the center of the stain. The remainder of the structure fill was then manually removed in one section (SEC 18697) (see Figure 105).

The control unit and section ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. Because of shallow depth and lack of stratigraphy, both the control unit and the section were excavated in one 0.11-m-deep level. Flotation and ^{14}C samples were collected from both the control unit and the section, and a pollen sample was scraped from the structure floor.

Feature Fill

A single stratum was present in the fill of Feature 17908. It consisted of a brown silty clay loam containing sparse, dispersed charcoal flecking, FAR, and oxidized sediment nodules. The fill displayed laminated sediments consistent with aeolian and alluvial deposition. In total, 91 artifacts were recovered from the structure fill: 20 pieces of unworked faunal bone, 42 pieces of FAR, 18 pieces of flaked stone debitage, 5 indeterminate ground stone fragments, 1 mano fragment, 4 metate fragments, and 1 San Pedro phase dart point (see Table 10).

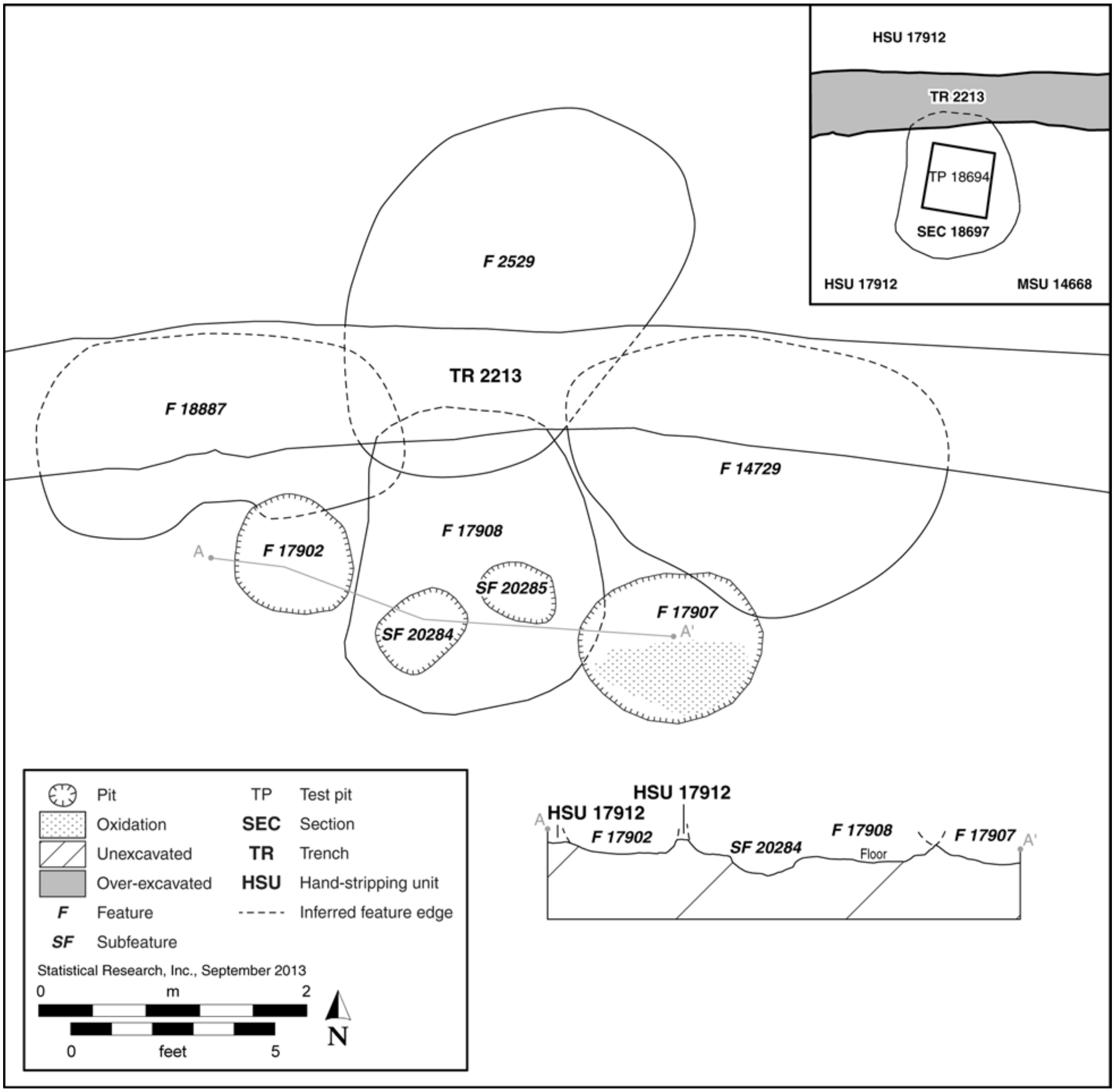

Figure 105. Post-excavation plan view and cross section of Features 17908 (a structure), 17902 (an adjacent pit), and 17907 (an intrusive pit) at Falcon Landing. The relationship between Features 2529 (an intrusive structure) and 18887 (an underlying structure) is also shown in the plan view.

Construction Details

Walls and Roof

Feature 17908 was built either in or around a pit that was at least 0.12 m in depth (Figure 106). The shape of the pit was likely ovate, but it was truncated by another structure (Feature 2529). Whether Feature 17908 was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Figure 106. Photograph of the floor of Feature 17908 at Falcon Landing, view to the north.

Floor

The floor of the structure consisted of the natural substrate. It did, however, display noticeable use compaction. No artifacts were found in contact with the floor.

Entry

No entryway was discernible.

Interior Features

Two intramural pits (Subfeatures 20284 and 20285) originated within the floor of Feature 17908 (Table 39; see Figure 105). Both were nonthermal, unlined pits with walls that consisted of the native substrate. Subfeature 20284 was basin shaped in cross section and measured 0.23 m in depth. In plan view, it was ovate and measured 0.67 m in length and 0.47 m in width. Subfeature 20285 was basin shaped in cross section and measured 0.08 m in depth. In plan view, it was ovate and measured 0.65 m in length and 0.40 m in width. Both pits were excavated in one stratigraphic unit and level. Flotation and ^{14}C samples were collected, and the remaining fill was screened through 1/4-inch mesh. A pollen sample was also scraped from the base of each pit. Charred plant remains from the fill of Subfeature 20285 and a pollen sample from the base were submitted for further analyses (see Chapters 6 and 7, Volume 2).

The pits contained similar fill consisting of a slightly hard, brown silty clay loam mottled with a moderate amount of charcoal flecking and pieces of oxidized sediment. It displayed laminated sediments consistent with aeolian and alluvial deposition. Subfeature 20284 contained nine pieces of FAR, and Subfeature 20285 contained a piece of unworked faunal bone and one piece of flaked stone debitage.

Evidence of Remodeling

No evidence of remodeling was observed.

Table 39. Intramural Features in Feature 17908 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
20284	ovate	basin	0.67	0.47	0.23	0.0724
20285	irregular	irregular	0.65	0.40	0.08	0.0208

Chronometric Data

Diagnostic Material Culture

A San Pedro–style projectile point was recovered from the floor fill of the structure. San Pedro–style projectile points have an estimated production range of ca. 1200 B.C.–A.D. 500 (Sliva 2009).

Geochronologic Analysis

Feature 17908 originated in Unit III2cf, the bracketing age range of which is ca. 160 cal. B.C.–cal. A.D. 340 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A charred cheno-am seed from the fill of Subfeature 20285 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of 160 cal. B.C.–cal. A.D. 330 (Aeon Sample No. 1492) (see Chapter 2, Volume 2). This date corresponds to the Late Cienega to Red Mountain phase.

Abandonment Processes

The artifacts present in the fill of the structure suggest trash disposal within the structure pit shortly after structure abandonment. Laminated sediments consistent with aeolian and alluvial deposition found throughout the fill indicated that natural processes also played a role in the filling of the structure pit. Similar sediment on the floor and within the two intramural pits suggests that the structure was dismantled upon abandonment. No evidence of architectural debris remained.

Stratigraphic Relationships and Associated Features

Feature 17908 originated within stratigraphic Unit III2cf. Both the stratigraphic position and the radiocarbon date of the feature indicate that it dates to the Late Cienega to Red Mountain phase. It was located within a cluster of several potentially contemporaneous structures and extramural pits (see Figure 91 and Appendix A). The northern edge of the structure was also overlain by another structure (Feature 2529) that was radiocarbon dated to 40 cal. B.C.–ca. A.D. 90 (see Figure 105). The age of Feature 2529 potentially limits the date range of Feature 17908 to 150–40 cal. B.C. Feature 2529 may represent an immediate reoccupation of the area following the abandonment of Feature 17908, because the two features were separated by a thin layer of naturally deposited silt. A thermal pit (Feature 17907) overlapped the eastern edge of Feature 17908, but the exact relationship between the two features is unknown.

Several other features within the area all dated, either geochronologically or with radiocarbon analysis, to the Late Cienega to Red Mountain phase. These included two structures, Feature 14702 to the south and Feature 17904 to the east, as well as an activity area (Feature 14729) immediately to the east. Feature 17908 also overlay a San Pedro phase structure (Feature 18887). This area of intensive use may represent several household groups.

Sixteen potentially contemporaneous extramural pits within stratigraphic Unit III2cf were located within 10 m of Feature 17908, including 3 thermal pits (Features 10724, 14700, and 17907), a charcoal/ash lens (Feature 14689), and 12 nonthermal pits (Features 10807, 14703, 14704, 14716, 17901, 17902, 17903, 17905, 17906, 17910, 17911, and 20288). Feature 14701 was the only pit in the cluster of features that originated in a different stratigraphic unit, one that corresponds to the Early Ceramic to Protohistoric period.

Red Mountain Phase Component

Feature 3963

Structure type: house-in-pit
Age: Red Mountain phase
Locus: Area B
Grid location: D2
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Total floor area (m^2): 11.45
Effective floor area (m^2): 11.15
Orientation: northeast
Length (m): 4.04
Width (m): 3.86
Excavated depth (m): 0.20
Volume (m^3): 2.750

Excavation Methods

Feature 3963 was a Red Mountain phase house-in-pit (see Table 10). The feature was initially identified during mechanical excavation of MSU 3873, appearing as an ashy, irregularly shaped stain with FAR (see Appendix A). A 1-by-2-m control unit (TP 4815) was placed over the central part of the structure and was excavated in three levels (Figure 107). Level 1 was an arbitrary level of feature fill that removed a baulk left by the mechanical excavations. Levels 2 and 3 were excavated, and a floor surface appeared in Level 3. The remainder of Feature 3963 was excavated in three sections; SEC 4819 was located north of the test pit, SEC 4821 was located over the southern half of the structure, and SEC 8049 was located over the entryway (Figure 108; see Figure 107). Macrobotanical samples were obtained from Levels 1 and 3 of the test pit and Level 1 of SEC 4819 and were submitted for further analyses. A pollen sample from Level 1 of SEC 4819 was also submitted for further analysis (see Chapters 6 and 7, Volume 2).

Feature Fill

Two strata were present in the structure fill. The upper stratum was limited to a shallow depression in the central part of the structure and consisted of very fine sand. The lower fill consisted of tan, soft, silty clay laminates. Artifacts included 6 ceramic sherds, 161 pieces of flaked stone debitage, 1 metate fragment, 1 mano fragment, 1 indeterminate ground stone fragment, and 12 pieces of faunal bone. A single piece of FAR was also recovered and collected (see Table 10).

Construction Details

Walls and Roof

Feature 3963 had a maximum depth of 0.20 m. Fourteen postholes were found and excavated within the structure (Table 40). The posthole arrangement was irregular. Some of the posts likely supported brush walls and a roof, and others may represent the remains of intramural features (see Figure 107).

Floor

The floor of the structure was an unprepared orange/tan substrate. It contained carbonate filaments and was slightly more compact than the feature fill. No artifacts were in contact with the floor.

Entry

A northeast-facing, protruding entryway was identified on the eastern wall of the structure (see Figure 107). Its fill was consistent with that of the main portion of the structure. The entry floor was flat.

Interior Features

Two nonthermal intramural pits (Subfeatures 8019 and 8021) originated at the structure floor (see Figure 107; Table 40). Subfeature 8019 was cylindrical in profile and circular in plan view. The pit was filled with a laminated silty clay with minimal charcoal flecking that contained one piece of faunal bone.

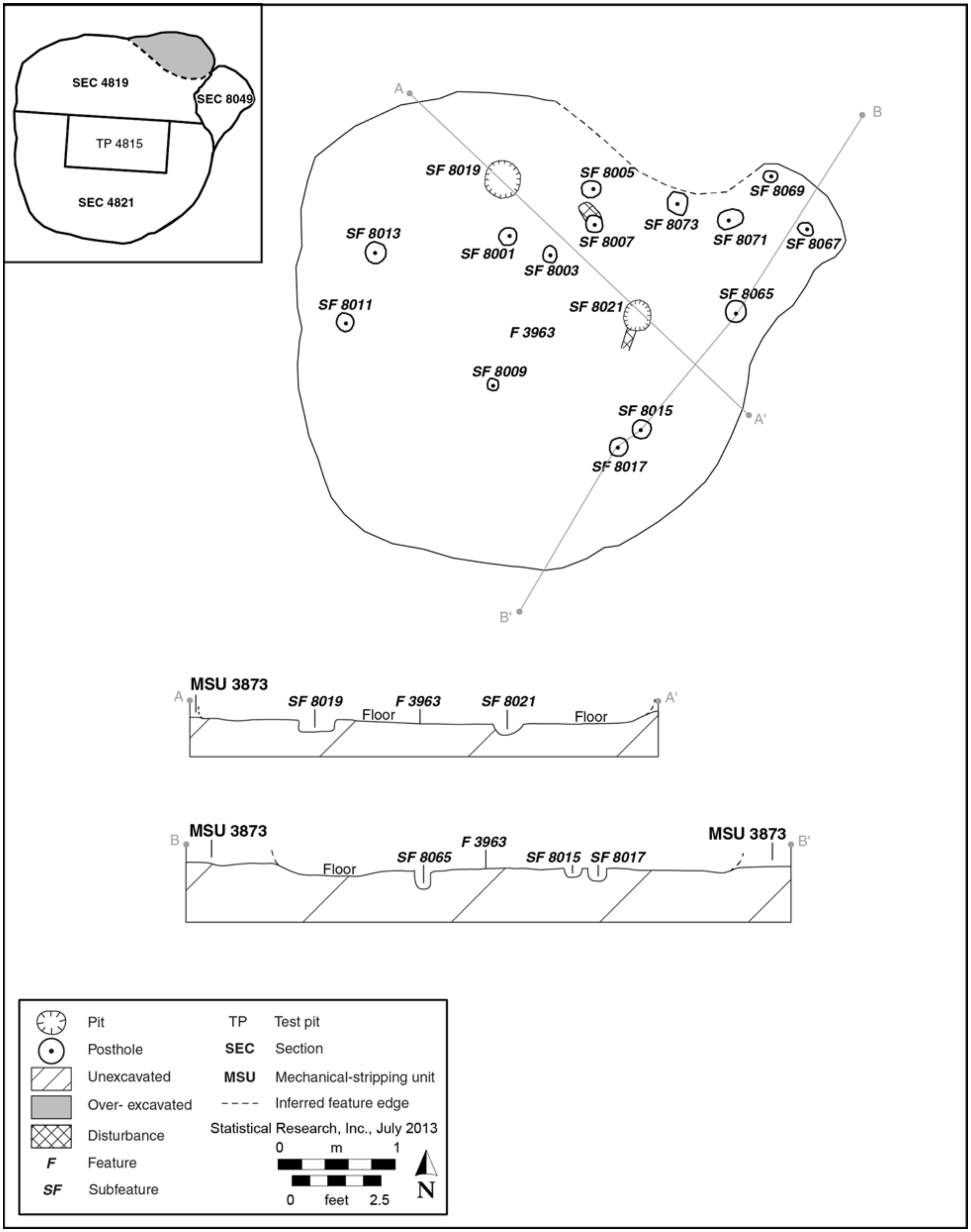

Figure 107. Post-excavation plan view and cross sections of Feature 3963 (a structure) at Falcon Landing.

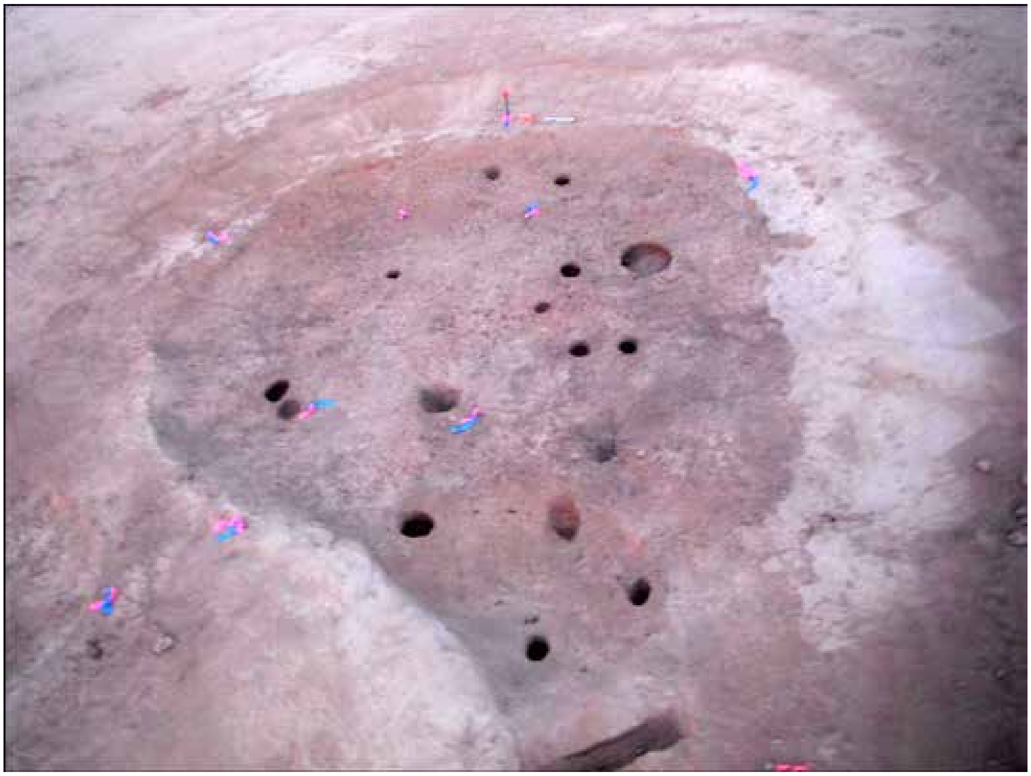

Figure 108. Photograph of the floor of Feature 3963 at Falcon Landing, view to the west.

Table 40. Intramural Features in Feature 3963 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
8019	circular	cylindrical	0.36	0.32	0.10	0.0115
8021	circular	conical	0.26	0.23	0.10	0.0060
Posthole						
8001	circular	cylindrical	0.16	0.13	0.12	0.0025
8003	circular	cylindrical	0.10	0.10	0.09	0.0009
8005	circular	cylindrical	0.12	0.10	0.14	0.0017
8007	circular	cylindrical	0.12	0.12	0.11	0.0016
8009	circular	cylindrical	0.10	0.10	0.09	0.0009
8011	circular	cylindrical	0.10	0.10	0.10	0.0010
8013	circular	cylindrical	0.14	0.13	0.14	0.0025
8015	circular	cylindrical	0.17	0.16	0.07	0.0019
8017	circular	cylindrical	0.17	0.16	0.12	0.0033
8065	circular	cylindrical	0.19	0.16	0.18	0.0055
8067	circular	cylindrical	0.12	0.11	0.16	0.0021
8069	circular	cylindrical	0.13	0.10	0.10	0.0013
8071	ovate	cylindrical	0.20	0.15	0.10	0.0030
8073	circular	cylindrical	0.18	0.15	0.10	0.0027

Subfeature 8021 was a small, conical pit containing fill that was similar to Subfeature 8019. The only artifact was a piece of FAR (not collected). A macrobotanical sample was recovered from the pit and sent for further analysis (see Chapter 6, Volume 2).

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
Six plain ware ceramic sherds were recovered from the fill of Feature 3963. The sherds were identified as Gila Plain, Salt variety (see Chapter 5, Volume 2).

Geochronologic Analysis
Feature 3963 was located at the surface of Unit III1, with Holocene or Historical period silt-loam alluvial-fan deposits (Unit V) overlying it. The unconformity between the Unit III1 surface and Unit IV provides a geochronologic date of ca. 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2).

Radiocarbon Analysis
A piece of burned mesquite (*Prosopis* sp.) wood was collected from Subfeature 8019 and submitted to Aeon for AMS analysis. The charcoal returned a 2σ calibrated date range of cal. A.D. 130–330 (Aeon Sample No. 1447) (see Chapter 2, Volume 2). This date range is consistent with the Red Mountain phase.

Abandonment Processes
Feature 3963 may have been filled by a combination of wind and water deposition as well as refuse dumping by occupants of the site. A shallow lens of fine sands above the central structure fill may have been the result of aeolian deposition. Because most of the artifacts were found in the upper feature fill, they may not be related to the occupation of the house.

Stratigraphic Relationships and Associated Features
Feature 3963 was radiocarbon dated to the Red Mountain phase. No other features were in direct contact with the structure (see Appendix A). Potentially contemporaneous features in the vicinity included an activity area, Feature 3954, 2.5 m to the east; it originated at the same stratigraphic position as Feature 3963. Nearby extramural features in the same stratigraphic unit included an ash lens (Feature 3964) and a nonthermal pit (Feature 3965). Other features within a 10-m radius of the structure originated in Unit III1, thus predating Feature 3963. Nearby extramural pits dating to the Middle to Late Archaic period included Features 3953, 3955, 3956, 3957, 3958, 3962, 3966, 3967, 8617, 8619, and 8646.

Feature 10849
Structure type: house-in-pit
Age: Red Mountain phase
Locus: Area A
Grid location: H4
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin
Total floor area (m^2): 7.86
Effective floor area (m^2): 7.62
Orientation: indeterminate
Length (m): 3.26
Width (m): 2.60
Excavated depth (m): 0.12
Volume (m^3): 0.980

Excavation Methods
Feature 10849 was a possible house-in-pit that dated to the Red Mountain phase (see Table 10). The structure was identified during mechanical excavation of MSU 10588 (see Appendix A). It appeared as a large, ovate, organic stain containing charcoal flecking, ash, FAR, and ground stone. A 1-by-2-m control unit (TP 13360)

was first hand-excavated near the center of the stain. The remainder of the structure fill was then manually removed in two sections, SECs 13368 and 16224 (Figure 109). Because the northern and eastern structure edges were over-excavated during mechanical excavation, those portions of the pit edges were inferred.

The control unit and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. TP 13360 was excavated in two stratigraphic levels. Level 1 corresponded to the upper stratum of structure fill, and Level 2 corresponded to the lower stratum of fill, directly above the floor of the structure. Flotation and pollen samples were recovered from both levels.

SEC 13368 contained only the lower stratum and was excavated in one stratigraphic level that ended at the structure floor. SEC 16224 contained both strata and was excavated in a single arbitrary level.

Feature Fill

The two strata differed only in their consistency and inclusions; both consisted of a yellowish brown silt loam that displayed fine, laminated bedding and sparse, dispersed ash and charcoal flecking. The lower stratum contained no gravels and was softer in consistency. The upper stratum was more compact and contained gravels. Both strata exhibited severe insect and plant bioturbation. Charcoal obtained from the lower stratum (SEC 13368, Level 1) was submitted for further analysis (see Chapter 6, Volume 2).

Similar types and quantities of artifacts were recovered from both strata. The total artifact count within the structure fill was 68 (see Table 10): 8 pieces of unworked faunal bone, 3 mano fragments, 2 metate fragments, 2 indeterminate ground stone fragments, a complete mano, 3 pieces of flaked stone debitage, and 49 pieces of FAR.

Construction Details

Walls and Roof

Feature 10849 was built either in or around an ovate pit that was at least 0.15 m in depth (Figure 110). Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The floor of the structure consisted of compacted natural sediments. No artifacts were found in contact with the floor, but a pollen sample recovered from the surface was submitted for analysis (see Chapter 7, Volume 2).

Entry

No entryway was discernible.

Interior Features

A single intramural pit (Subfeature 16226) originated at the structure floor (see Figure 109). The pit was unburned and basin shaped in cross section and measured 0.21 m in depth. It was irregularly shaped in plan view, measuring 0.50 by 0.42 m. Subfeature 16226 was excavated in one stratigraphic unit and level. A flotation sample was collected, and the remaining fill was screened through 1/4-inch mesh. A pollen sample was scraped from the pit base. The pit fill was harder than the structure-floor fill but was of a similar color and consistency and contained the same amount of plant and insect bioturbation. The fill contained one complete mano, four metate fragments, one indeterminate ground stone fragment, and seven pieces of FAR. The metate fragments appeared to be parts of a single broken metate. The hardness of the pit fill in comparison to the structure fill may indicate that the pit was filled during use of the structure and thereafter became inadvertently compacted, prior to structure abandonment.

Evidence of Remodeling

No evidence of remodeling was observed.

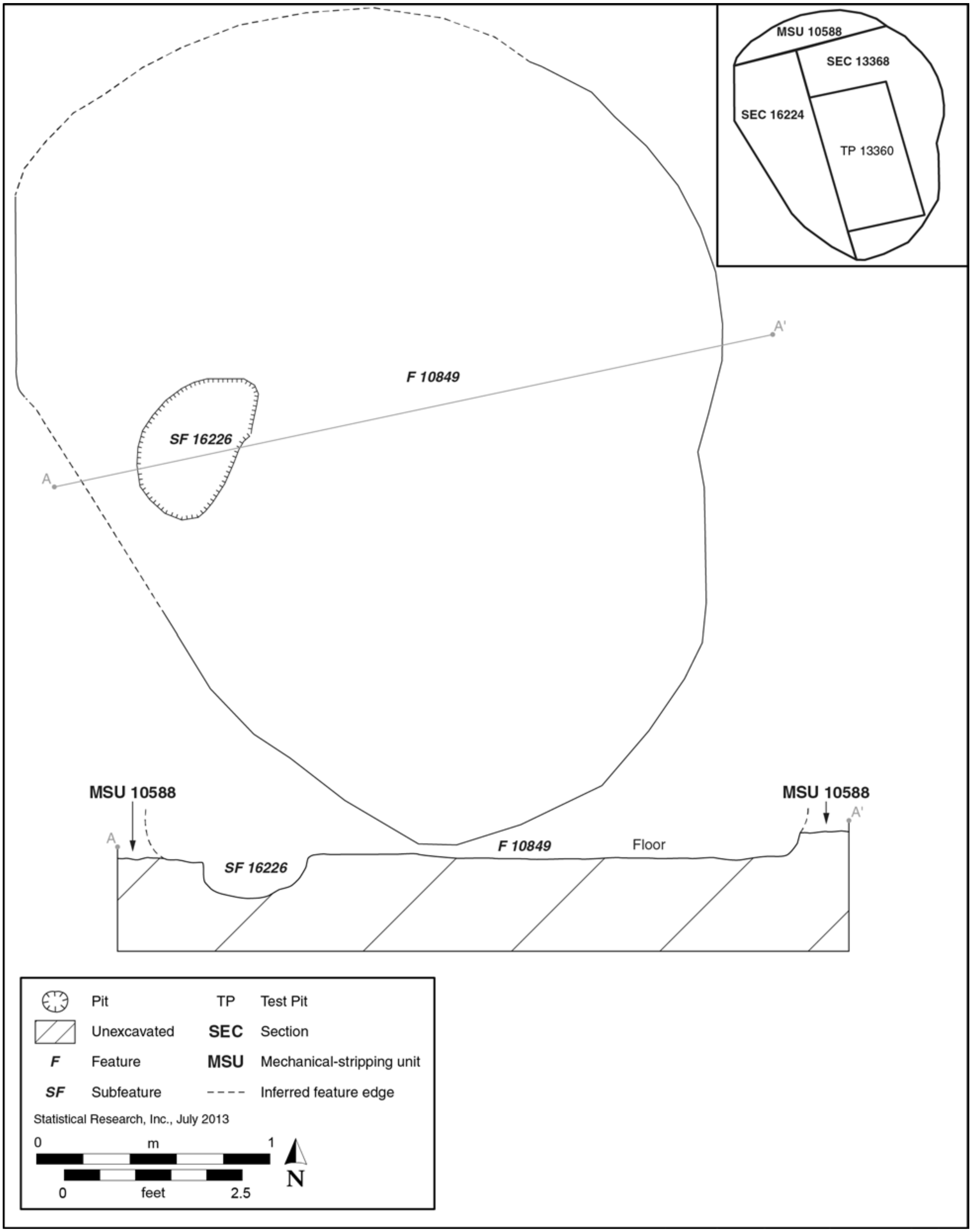

Figure 109. Post-excavation plan view and cross section of Feature 10849 (a structure) at Falcon Landing.

Figure 110. Photograph of the floor of Feature 10849 at Falcon Landing, view to the north.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 10849 originated at or near the surface of Unit III2cf, with latest Holocene alluvial deposits (Unit V) overlying it. The unconformity between Unit III2cf and Unit V provides a geochronologic date of cal. A.D. 340–1520 (see Chapter 2, Volume 2).

Radiocarbon Analysis
A mesquite (*Prosopis* sp.) charcoal fragment recovered from the floor fill (Level 1, SEC 13368) was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of cal. A.D. 260–430 (Aeon Sample No. 1546) (see Chapter 2, Volume 2). This date range places the use of the structure in the Red Mountain phase.

Abandonment Processes
Abundant FAR and other artifacts throughout the structure fill may have been the results of trash disposal within the house pit shortly after structure abandonment. Both strata associated with the structure fill contained laminae indicative of wind-borne and water-lain deposits. This stratigraphy and the artifacts in the lower structure fill suggest that the structure may have been dismantled prior to the infilling of the structure pit. The relatively small amount of charcoal and the lack of architectural debris in the structure fill, as well as the absence of oxidation and charcoal staining from the floor, indicate that the structure did not burn. It is possible that the compaction differences between the two strata were the results of fairly rapid and partial

infilling of the house pit with trash, followed by a more prolonged period during which the remainder of the house pit was filled with alluvial or aeolian sediments.

Stratigraphic Relationships and Associated Features
Feature 10849 originated at Unit III2cf, under Unit V, the date range of which corresponds to the Early Ceramic to Protohistoric period. The time span was narrowed by the radiocarbon sample, placing the pit in the Red Mountain phase. No other structures were near Feature 10849. A few extramural nonthermal pits were within 10 m of the structure; most were in a cluster to the southeast (see Appendix A). Nearly all of the pits predated the structure; only two (Features 10824 and 10825) had a broad date range equivalent to the Middle Archaic to Protohistoric period.

Early Ceramic to Protohistoric Period Component

Feature 10735

Structure type: house-in-pit
Age: Early Ceramic to Protohistoric period
Locus: Area A
Grid location: H5
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 5.19
Effective floor area (m^2): 5.03
Orientation: indeterminate
Length (m): 3.25
Width (m): 2.32
Excavated depth (m): 0.13
Volume (m^3): 0.720

Excavation Methods
Feature 10735 was an Early Ceramic to Protohistoric period house-in-pit discovered during mechanical excavation of MSU 10588 (see Table 10). It appeared on the stripping surface as an irregularly shaped, ashy stain containing charcoal and FAR (see Appendix A). Hand-excavation proceeded with a 1-by-2-m control unit (TP 12298) near the center of the stain. A single level was removed to expose a floor surface. The remainder of the structure was then excavated in two sections, SEC 12377 to the east and SEC 12428 to the west (Figure 111). The sections were removed in one level each. SEC 12428 was over-excavated, because the western structure edge was poorly defined (Figure 112). In that area, slight differences in soil texture and bioturbation were the only differences between the structure fill and the natural substrate.

Feature Fill
The feature contained a single stratum of brown silt loam. A very small quantity of charcoal was present, and 119 pieces of FAR were noted but not collected. In total, 96 artifacts were recovered from the structure: 7 pieces of faunal bone, 84 pieces of flaked stone debitage, 2 hammerstone fragments, and 1 metate fragment in the fill and 1 mano and 1 mano fragment in contact with the floor (see Table 10). A pollen sample scraped from the floor was submitted for further analysis, as was a macrobotanical sample from Level 1 (see Chapters 6 and 7, Volume 2).

Construction Details

Walls and Roof
The structure was built within a pit that was at least 0.13 m in depth. The shape of the pit was likely ovate, although the southwestern edge was largely inferred. Three wall postholes were found just below the pit walls; all were on the eastern side of the structure (Table 41; see Figure 111). Subfeature 14137 was excavated as a single unit and level. Following its excavation, it appeared to represent two adjacent postholes. Subfeature 14137 may represent one post that was later reinforced with a second post, but because of the manner in which it was excavated, the single subfeature number was retained. The subfeature fill consisted of a soft, blocky gray-brown silt loam with charcoal pieces. One of the charcoal fragments was sent for

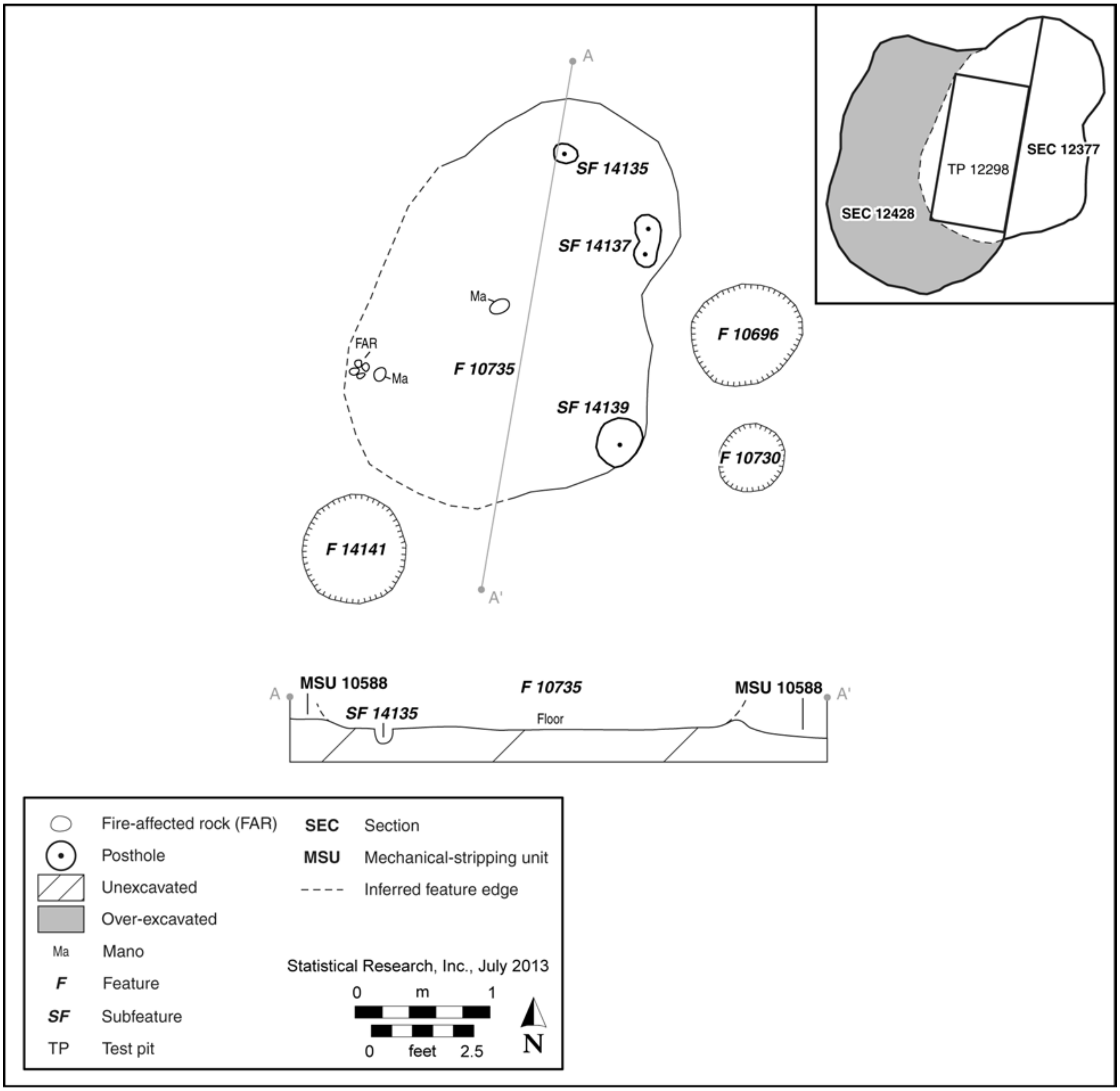

Figure 111. Post-excavation plan view and cross section of Feature 10735 (a structure) at Falcon Landing. The relationship among Features 10696, 10730, and 14141 (adjacent pits) is also shown in the plan view.

Figure 112. Photograph of the floor of Feature 10735 at Falcon Landing, prior to the excavation of the postholes, view to the south.

Table 41. Intramural Features in Feature 10735 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Posthole						
14135	circular	cylindrical	0.17	0.16	0.12	0.0033
14137	ovate	cylindrical	0.35	0.20	0.15	0.0105
14139	circular	cylindrical	0.35	0.32	0.17	0.0190

macrobotanical analysis (see Chapter 6, Volume 2). The structure likely had a temporary brush-and-grass superstructure, but lack of information precludes any further characterization of the architecture.

<u>**Floor**</u>

The floor consisted of the unprepared natural sediments. One complete mano and one fragmentary mano were found in contact with the floor (Table 42; see Figure 111).

<u>**Entry**</u>

No entryway was noted during the excavations.

<u>**Interior Features**</u>

No interior features were observed.

Evidence of Remodeling

No obvious evidence of remodeling was observed.

Table 42. Point-Located Floor Artifacts in Feature 10735 at Falcon Landing

PD No.	Stratum	Artifact Class	Artifact Type	Count
14234	floor	lithic	mano	1
14235	floor	lithic	mano	1

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 10735 originated at or near the Unit III2cf surface, with latest Holocene alluvial-fan deposits (Unit V) overlying it. The unconformity between Unit III2cf and Unit V provides a geochronologic date of cal. A.D. 340–1520 (see Chapter 2, Volume 2), corresponding to the Early Ceramic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
Feature 10735 contained a relatively large quantity of artifacts, including FAR. The manos in contact with the floor were not removed before abandonment of the structure. The posthole fill contained charcoal, unlike the sediment in the main structure pit. The postholes may have been filled in a separate episode of deposition. The structure itself seems to have then been intentionally filled with refuse sometime during the occupation of the site. The lack of charcoal, burned architectural debris in the structure fill, and oxidation and charcoal staining on the floor indicates that the structure did not burn. So, the structure was likely abandoned and later filled with a combination of natural alluvial sediments and intentionally deposited refuse.

Stratigraphic Relationships and Associated Features
The broad geochronologic date range of Feature 10735 spans the Early Ceramic to Protohistoric period. No other structures were in the vicinity, but a large number of extramural features lay within 10 m of the structure (see Appendix A). Various pits, ash lenses, and FAR concentrations in the surrounding area were in the same stratigraphic unit and thus potentially contemporaneous. These included Features 10668, 10685, 10687, 10688, 10689, 10690, 10693, 10695, 10697, 10704, 10735, 10736, 10739, 10741, 10760, and 14141. Other neighboring pits dated to the Late Cienega to Red Mountain phase included Features 10640, 10641, 10642, 10643, 10662, 10663, 10664, 10665, 10666, 10667, 10670, 10672, 10686, 10692, 10696, 10722, 10730, 10731, 10733, 10737, 10738, 10759, 10767, 10769, 13976, 14657, 14662, 14673, and 14674. Because the time spans of these pits overlap that of Feature 10735, they are potentially contemporaneous with it.

Pioneer Period Component

Feature 1290
Structure type: house-in-pit
Age: Snaketown phase
Locus: Area B
Grid location: B4
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 2.50
Effective floor area (m^2): 2.42
Orientation: indeterminate
Length (m): indeterminate
Width (m): 2.20
Excavated depth (m): 0.21
Volume (m^3): 1.140

Excavation Methods

Feature 1290 was a Snaketown phase house-in-pit (see Table 10). The structure was discovered in the northern profile of TR 1230, which had removed the southern edge of the feature. It was further defined in plan view during the mechanical stripping of MSU 1281 (see Appendix A). The feature was observed as a truncated ovate stain containing cobbles. A 1-by-1-m control unit (TP 5689) was excavated near the center of the stain, and the remainder of structure fill was removed in two sections (SECs 5718 and 5755) (Figure 113).

The control unit and sections ended with exposure of the structure floor, which consisted of a relatively compact, continuous, and hard earthen surface. TP 5689 was excavated in two levels. Level 1 was arbitrarily terminated at 0.10 m in depth, and Level 2 ended at the floor. SECs 5718 and 5755 were excavated in one level, to the floor.

Feature Fill

A single stratum was present in Feature 1290. It consisted of a loose, dark yellowish brown silty loam containing dispersed gravels, ash, and charcoal and a high density of artifacts. Artifact density decreased with depth, and artifacts included 25 faunal bones, 88 pieces of flaked stone debitage, and 2 edge-modified flakes. One mineral was also collected.

Construction Details

Walls and Roof

Feature 1290 was built in a pit that was at least 0.21 m in depth (Figure 114). The pit was likely ovate but had been truncated by TR 1230. Four postholes were located just below the pit wall, and a fifth (Subfeature 5789) was slightly inset (Table 43; see Figure 113). The postholes were all circular in plan view. Three were conical in cross section, and two were irregular. They ranged from 0.17 to 0.21 m in diameter and varied in depth from 0.06 to 0.33 m (see Table 43). One posthole (Subfeature 5797) produced a piece of faunal bone. Little can be said about the walls and roof, because architectural debris was not present within the fill.

Floor

The floor of the structure consisted of the natural substrate and was slightly compacted from use. No artifacts were found in contact with the surface.

Entry

No entryway was discernible.

Interior Features

A single nonthermal pit (Subfeature 5803) originated at the structure floor (see Figure 113). The pit was basin shaped in cross section and 0.20 m in depth (see Table 43). It was cut by TR 1230, making the full plan view and dimensions indeterminate. The remaining pit length was 0.64 m. A single stratum was present within Subfeature 5803 and consisted of a very dark yellowish brown silty loam that was darker and slightly more compacted than the structure fill. It may have been infilled before abandonment of the structure. Plant and insect bioturbation was noted throughout. A pollen sample was scraped from the pit base and submitted for analysis (see Chapter 7, Volume 2). The artifacts were two pieces of flaked stone debitage.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

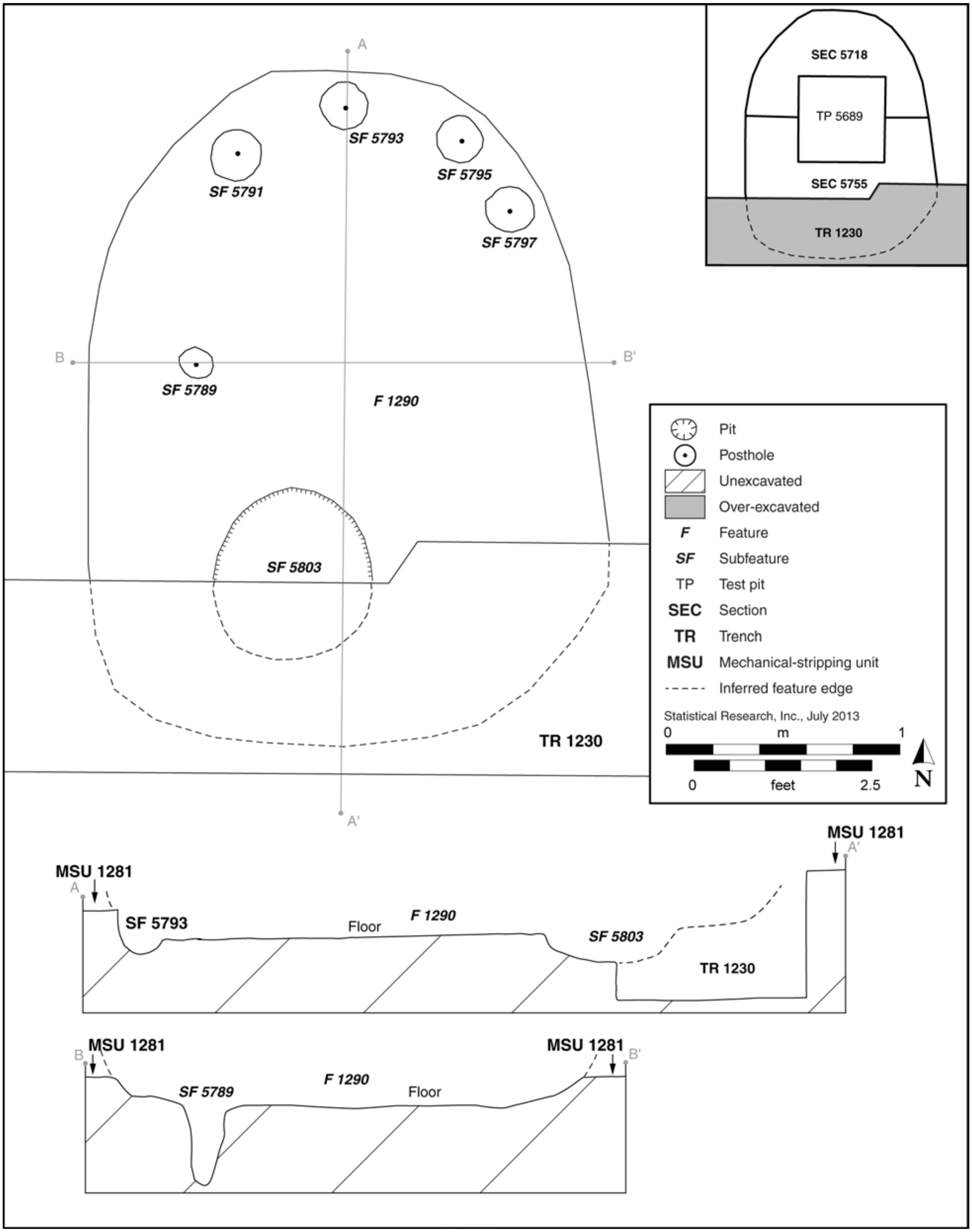

Figure 113. Post-excavation plan view and cross sections of Feature 1290 (a structure) at Falcon Landing.

Figure 114. Photograph of the floor of Feature 1290 at Falcon Landing, view to the north.

Table 43. Intramural Features in Feature 1290 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
5803	indeterminate	basin	0.64	indeterminate	0.20	indeterminate
Posthole						
5789	circular	conical	0.20	0.17	0.33	0.0112
5791	circular	irregular	0.21	0.20	0.07	0.0029
5793	circular	irregular	0.21	0.20	0.06	0.0025
5795	circular	conical	0.21	0.20	0.13	0.0055
5797	circular	conical	0.21	0.18	0.24	0.0091

Geochronologic Analysis

Feature 1290 was located at the surface of Unit III2, with late Holocene or Historical period alluvial-fan deposits (Unit V) overlying it. The unconformity between the Unit III2 surface and Unit V provides a geochronologic date of ca. 200 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2).

Radiocarbon Analysis

During Phase 1, a piece of charred saltbush (*Atriplex* sp.) wood from the fill of Feature 1290 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of cal. A.D. 640–670 (Aeon Sample No. 679). This date corresponds to the Snaketown phase of the Hohokam chronology (see Chapter 2, Volume 2).

Abandonment Processes

The relatively small amount of charcoal and the lack of architectural debris in the structure fill, as well as the minimal oxidation and charcoal staining on the floor, indicate that the structure did not burn. It was likely infilled by a combination of natural and cultural processes. This is supported by the presence of wind-borne and water-lain deposits and by the high density of artifacts observed in the uppermost sediments. These may represent secondary dumping episodes but could be contemporaneous with the structure's occupation.

Stratigraphic Relationships and Associated Features

Feature 1290 was located at the unconformity between the Unit II2 surface and Unit V. This corresponds to the Late Archaic to Protohistoric period. The date was further refined by the radiocarbon results, which placed the house in the Snaketown phase. The nearest potentially contemporaneous feature was an activity area, Feature 1239, 6.5 m to the west (see Appendix A). It was located in the Unit II2 horizon and dated to the Late Archaic period. Another activity area, Feature 1303, was 1.5 m to the east. It was radiocarbon dated to the Chiricahua phase, predating Feature 1290. Several pits contemporaneous with Feature 1303 included Features 5427, 5428, 5429, and 5582. To the south and east of Feature 1290, a number of pits were dispersed over the landscape. These included Features 1240, 1296, 1297, 1299, 1300, 1305, 1306, 1329, 1339, 1340, 1476, 1477, 1478, 5860, 5863, 8156, and 8178, all of which originated at the Unit I surface, below Unit III2. These pits dated to the Early to Middle Archaic period.

Pioneer to Classic Period Component

Feature 3322

Structure type: surface structure
Age: Pioneer to Classic period
Locus: Area B
Grid location: D6
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: flat

Total floor area (m^2): 4.62
Effective floor area (m^2): 4.55
Orientation: indeterminate
Length (m): 3.08
Width (m): 2.88
Excavated depth (m): 0.01
Volume (m^3): 0.070

Excavation Methods

Feature 3322 was a surface structure that dated to the Pioneer to Classic period (see Table 10). It was encountered during mechanical excavation of MSU 3317 (see Appendix A) and appeared on the stripping surface as a circular, organic stain that was overlapped along the northern margin by another, larger, ovate, organic stain (Feature 3321). A control unit was excavated for each feature; TP 8670 was entirely within Feature 3321, and TP 8675 ended up straddling both features (Figure 115). TP 8675 was excavated in one level, beyond the floors of the structures.

Following excavation of the test pits, the excavators determined that only one structure (Feature 3321) existed, based on the results of the test-unit excavation and the removal of the baulk left between the test pits. The entire southern half of Feature 3321 and all of Feature 3322 were then excavated as one unit (SEC 8685) (see Figure 115). Once the floor of each structure had been exposed, it became evident, based on posthole patterning, that two structures did actually exist. A small portion of SEC 8685 was over-excavated beyond the bounds of both features (see Figure 115).

Feature Fill

Feature 3322 was a surface structure with very little associated fill. A very thin level (0.01 m thick) of sediment was removed from the floor surface during the excavation of SEC 8685. It was a yellow-brown silt loam with minimal sand inclusions. Charcoal fragments and FAR were noted, but there were no other artifacts (see Table 10).

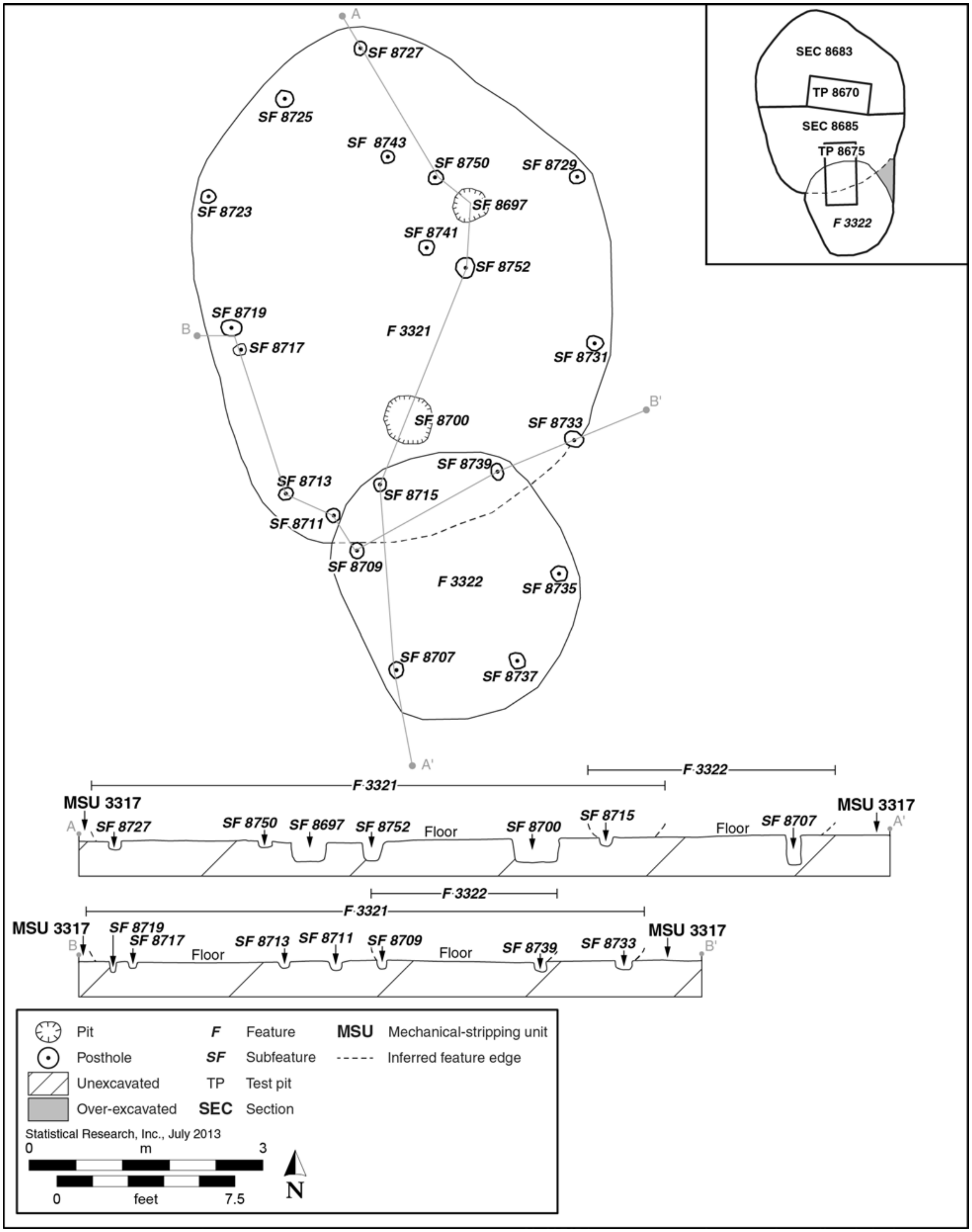

Figure 115. Post-excavation plan view and cross sections of Features 3321 and 3322 (overlapping structures) at Falcon Landing.

Construction Details

Walls and Roof

Six wall postholes were identified upon excavation of 0.01 m of overlying sediment (Figure 116). They were arranged in a circular pattern and were not associated with a structure pit (see Figure 115). Higher quantities of charcoal were present in the postholes than in the thin layer of overlying sediment excavated in SEC 8685. The postholes had similar fill. Posthole Subfeatures 8707 and 8735 each contained a piece of lithic debitage (Table 44).

Floor

The floor was an unprepared surface. It contained a higher proportion of silt and carbonates than the thin layer of sediment above it and was also more compact. Insect and root activity had impacted the floor. Intramural features were visible on the floor upon its exposure. No artifacts were found in contact with the floor.

Entry

No entryway was identified.

Interior Features

No interior features were seen within Feature 3322.

Evidence of Remodeling

No evidence of remodeling was observed.

Figure 116. Photograph of the floors of Features 3321 (*background*) and 3322 (*foreground*) at Falcon Landing, view to the northwest.

Table 44. Intramural Features in Feature 3322 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m³)
Posthole						
8707	circular	cylindrical	0.17	0.15	0.35	0.0089
8709	circular	cylindrical	0.17	0.14	0.10	0.0024
8715	circular	cylindrical	0.17	0.15	0.10	0.0026
8735	circular	cylindrical	0.11	0.11	0.18	0.0022
8737	circular	cylindrical	0.16	0.15	0.16	0.0038
8739	circular	cylindrical	0.16	0.16	0.09	0.0023

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 3322 was located within Unit IV. The bracketing age range for Unit IV is cal. A.D. 610–1220 (see Chapter 2, Volume 2), corresponding to the Pioneer to Classic period.

Radiocarbon Analysis
None.

Abandonment Processes
The structure does not appear to have burned, because there was no charcoal staining, burned architectural debris, or oxidation on the floor. More charcoal was found in the posthole fill than in the structure fill, and this difference may represent different periods of deposition. The silt-loam fill covering the floor of the structure suggests that the structure was abandoned and covered with natural alluvial or aeolian sediments.

Stratigraphic Relationships and Associated Features
Feature 3322 originated in Unit IV, a stratigraphic horizon that dates to the Pioneer to Classic period. Feature 3322 overlapped with another structure (Feature 3321), a Snaketown phase house-in-pit (see Figure 115 and Appendix A). The exact stratigraphic relationship of Features 3321 and 3322 was not apparent during excavation, but the two structures may be closely related in time. The radiocarbon date obtained for Feature 3321 is more precise than the stratigraphic date for Feature 3322; therefore, the ages cannot be directly compared. Other nearby features may be contemporaneous with the structures, including Features 3290, 3319, 3321, 3322, 3335, and 3336, all of which dated to the Pioneer to Classic period. Most neighboring features predated Feature 3322 and originated during the Chiricahua phase. A few other features in the area were located in stratigraphic units dating to the Middle Archaic to Pioneer period.

Snaketown Phase Component

Feature 3321

Structure type: house-in-pit
Age: Snaketown phase
Locus: Area B
Grid location: D6
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Total floor area (m^2): 18.14
Effective floor area (m^2): 17.60
Orientation: indeterminate
Length (m): 5.80
Width (m): 4.80
Excavated depth (m): 0.14
Volume (m^3): 3.060

Excavation Methods
Feature 3321 was a Snaketown phase house-in-pit (see Table 10). The structure was discovered during mechanical excavation of MSU 3317 (see Appendix A). It appeared on the stripped surface as an ovate, organic stain that was overlapped along the southern margin by a smaller, circular, organic stain (Feature 3322). A control unit was excavated for each feature; TP 8670 was entirely within Feature 3321, and TP 8675 straddled both features (see Figure 115). TP 8670 was excavated in two arbitrary levels; the first leveled a small baulk left during mechanical stripping, and the second level encountered the floor. A macrobotanical sample and a pollen sample obtained from Level 1 of the test pit were sent for further analyses, along with a macrobotanical sample collected from the floor (Level 2) (see Chapters 6 and 7, Volume 2). TP 8675 was excavated in one level, to a depth that extended below the floor of each structure.

Following excavation of the test pits, the excavators determined that only one structure (Feature 3321) existed, based on the results of the test-unit excavation and the removal of the baulk left between the test pits. The entire southern half of Feature 3321 and all of Feature 3322 were then excavated as one unit (SEC 8685) (see Figure 115). A small portion of SEC 8685 was over-excavated beyond the bounds of both features. Once the floor of each structure had been exposed, it became evident, based on posthole patterning, that two structures did actually exist. Lastly, the northern portion of Feature 3321 was excavated as SEC 8683 (see Figure 115).

Feature Fill
The fill of Feature 3321 was a single stratum of yellow-brown silt loam with occasional charcoal flecks. Minimal bioturbation in the form of rodent, plant, and insect disturbance was present. The fill included small pieces of FAR (not collected), six pieces of flaked stone debitage, and two pieces of unworked faunal bone (see Table 10). No architectural debris was found in the structure fill.

Construction Details

Walls and Roof
Ten wall postholes were found and excavated within the structure (see Figure 116). They were located immediately below the pit edge and framed the floor of the structure. Four intramural postholes were also identified in the structure floor (see Figure 115) and could be representative of roof supports or other intramural subfeatures.

The posthole fill was similar to the structure fill but contained higher quantities of charcoal (Table 45). The only artifact found in a posthole was a mano in Subfeature 8713. No architectural debris was preserved in the structure fill, and little can be inferred about the walls and roof. The feature is presumed to have been an impermanent brush structure.

Floor
The floor consisted of the unprepared natural substrate and showed no notable use compaction. The floor surface was identified by the appearance of subfeatures. No artifacts were found in contact with the floor.

Entry
No entryway was identified.

Interior Features:
Two intramural nonthermal pits (Subfeatures 8697 and 8700) originated at the floor of the structure (see Figure 115). Both pits were circular in plan view and had cylindrical cross sections and flat bases (see Table 45). Pollen and macrobotanical samples were obtained from each pit and submitted for further analysis (see Chapters 6 and 7, Volume 2).

Subfeature 8697 was located in the northern portion of the structure. It contained FAR (not collected), sparse charcoal, and fill that was darker than the structure fill. The only other artifact in Subfeature 8697 was a piece of flaked stone debitage.

Table 45. Intramural Features in Feature 3321 at Falcon Landing

Subfeature No., by Subfeature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Nonthermal pit						
8697	circular	cylindrical	0.33	0.30	0.23	0.0228
8700	circular	cylindrical	0.45	0.40	0.26	0.0468
Posthole						
8711	circular	cylindrical	0.15	0.13	0.09	0.0018
8713	circular	cylindrical	0.13	0.13	0.07	0.0012
8717	circular	cylindrical	0.13	0.13	0.07	0.0012
8719	circular	cylindrical	0.17	0.17	0.12	0.0035
8723	circular	cylindrical	0.18	0.14	0.12	0.0030
8725	circular	cylindrical	0.16	0.16	0.20	0.0051
8727	circular	cylindrical	0.14	0.14	0.09	0.0018
8729	circular	cylindrical	0.14	0.14	0.14	0.0027
8731	circular	cylindrical	0.18	0.18	0.10	0.0032
8733	circular	cylindrical	0.17	0.17	0.10	0.0029
8741	circular	cylindrical	0.15	0.14	0.20	0.0042
8743	circular	cylindrical	0.14	0.14	0.10	0.0020
8750	circular	cylindrical	0.15	0.15	0.06	0.0013
8752	circular	cylindrical	0.26	0.25	0.23	0.0150

Subfeature 8700 was in the southern portion of the structure. Its fill was also darker than the structure fill, but it contained no burned material. Artifacts recovered included one piece of debitage and six pieces of faunal bone.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 3321 was located within Unit IV, the bracketing age range of which is cal. A.D. 610–1220 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of burned mesquite (*Prosopis* sp.) wood was collected from the floor fill (Level 2) of TP 8670. It was submitted to Aeon for AMS dating and returned a 2σ calibrated date of cal. A.D. 650–770 (Aeon Sample No. 1495) (see Chapter 2, Volume 2). This date range corresponds to the Snaketown phase of the Pioneer period.

Abandonment Processes

The structure had very little depth; the majority of the feature was less than 2 cm thick. The upper house pit may have been removed during mechanical stripping, or the structure may have been extremely shallow or surficial. What remained of the structure pit appeared to have been filled by natural processes. Little charcoal was found in the structure, but comparatively large amounts were recovered from the postholes. The intramural pits had a slightly darker fill material, which may indicate that they were filled before abandonment.

Stratigraphic Relationships and Associated Features

Feature 3321 originated in Unit IV, a stratigraphic horizon that dates to the Pioneer to Classic period. The radiocarbon results further refined the date to the Snaketown phase of the Pioneer period. Associated features included the intrusive structure, Feature 3322 (see Figure 115 and Appendix A). A few other features in the area were located at the surface of Unit IIA, overlain by Unit IV, and dated to the Middle Archaic to Pioneer period. These included Features 3308, 3309, 11025, 11028, 11086, and 11087.

Protohistoric Period Component

Feature 2630

Structure type: possible structure
Age: Protohistoric period
Locus: Area A
Grid location: H5
Level of effort: sampled
Plan-view shape: indeterminate
Cross-sectional shape: irregular
Total floor area (m^2): indeterminate
Effective floor area (m^2): indeterminate
Orientation: indeterminate
Length (m): 3.40
Width (m): indeterminate
Excavated depth (m): 0.51
Volume (m^3): indeterminate

Excavation Methods

Feature 2630 was a possible structure of indeterminate form dating to the Protohistoric or early Historical period (see Table 10). It was originally identified during Phase 1 in the profile of TR 2219 (see Appendix A). The feature originated near the modern ground surface and was built partially upon channel deposits (Figure 117). Feature 2630 was not relocated during Phase 2 mechanical stripping of MSU 4580.

Feature Fill

A single stratum was present within Feature 2630; it consisted of a sandy silt containing sparse, dispersed charcoal fragments. Nine pieces of unworked faunal bone were recovered from the trench profile. A macrobotanical sample was also obtained from the profile and was submitted for further analysis (see Chapter 6, Volume 2).

Construction Details

Walls and Roof

Feature 2630 was built either in or around a pit that was at least 0.51 m in depth. Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not present within the structure fill, little can be said about the structure walls.

Floor

The inferred floor was observed only in the profile of TR 2219. It was a somewhat-use-compacted surface consisting of the natural substrate.

Entry

No entryway was discernible.

Interior Features

None were observed.

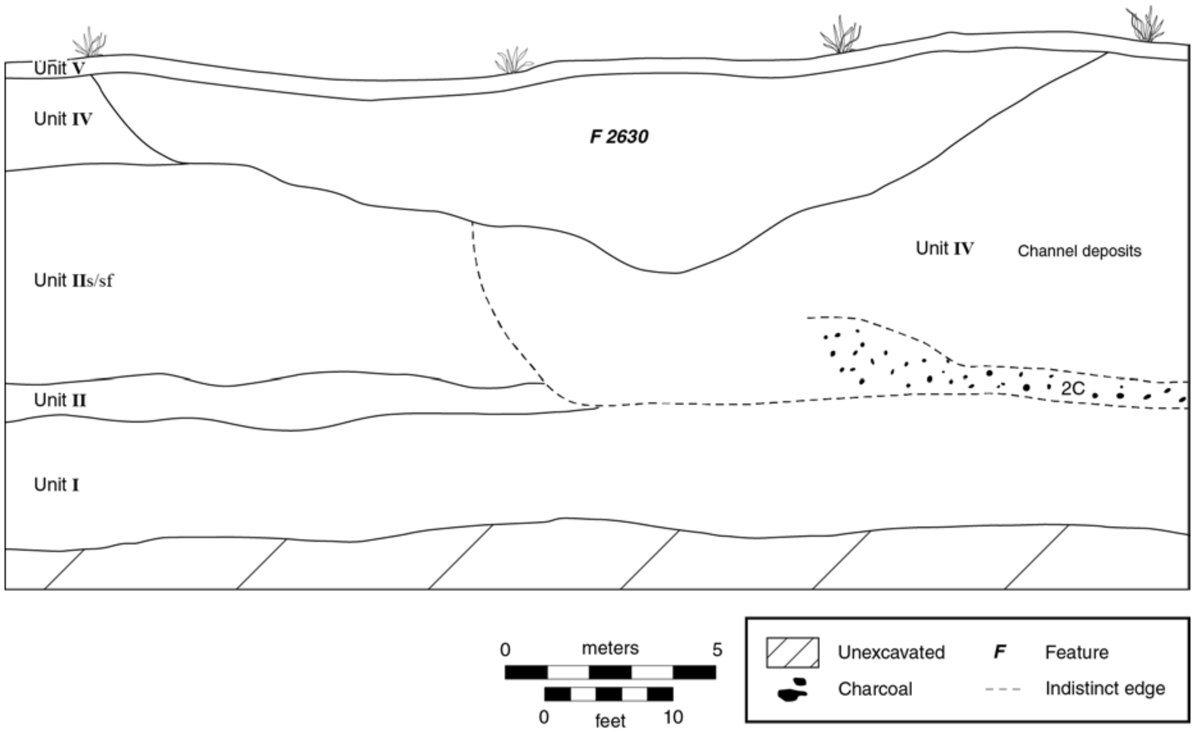

Figure 117. Profile of Feature 2630 (a structure), in the northern wall of TR 2219, at Falcon Landing.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

__Diagnostic Material Culture__
None.

__Geochronologic Analysis__
Feature 2630 was located at the surface of Unit IV, with latest Holocene or Historical period alluvial-fan deposits (Unit V) overlying it. The unconformity between the surface of Unit IV and Unit V provides a geochronologic date of cal. A.D. 1220–1520 (see Chapter 2, Volume 2).

__Radiocarbon Analysis__
During Phase 1, a piece of unburned mesquite (*Prosopis* sp.) wood from the fill of Feature 2630 was submitted to Aeon for AMS dating and returned a 2σ calibrated date range of cal. A.D. 1520–1800 (Aeon Sample No. 739). This date corresponds to the Protohistoric or early Historical period (see Chapter 2, Volume 2). The unburned mesquite wood was mistaken for burned material and may not reflect cultural activity.

Abandonment Processes
No sequence could be established, because the structure was only examined in profile.

Stratigraphic Relationships and Associated Features
Feature 2630 originated at the surface of Unit IV, with the uppermost and youngest geologic unit identified at the site (Unit V) overlying it (see Figure 117). The structure was also in proximity to three other features from different time periods: Feature 4588, stratigraphically dated to the Chiricahua phase; Feature 4589,

stratigraphically dated to the Middle to Late Archaic period; and Feature 10514, radiocarbon dated to the Sedentary to Classic period (see Appendix A).

Activity Areas

Following the HPTP (Hall et al. 2011:52), activity areas are categorized with middens or large trash deposits and were considered to be "too large to excavate in their entirety." During Phase 2 data recovery, several activity areas were identified and sampled, but these features were quite different from what was conceptualized in the HPTP.

During the course of Phase 2 data recovery, numerous possible structures were identified and excavated. These possible structures were of sizes and shapes that were similar to those of other structures excavated in the project area; each consisted of a basin-shaped depression, much like a "house-in-pit" structure. These features, however, lacked other basic criteria used to define a structure, such as discernible walls, entryways, postholes, or hearths. Features falling into this category were designated activity areas. Activity areas are interpreted as aboriginal use areas that may or may not have been associated with a built structure or specific function (e.g., tool manufacture/maintenance, plant-food processing, butchery, etc.). The distinction between a structure and an activity area was sometimes blurred. As with similar Archaic period aged activity areas identified in northern New Mexico, Schmader (2001) indicated that sometimes the difference between an activity area and an Archaic period structure or ramada is no more than the ability to identify a posthole pattern. However, the importance of these areas for the interpretation of Archaic period lifeways is not diminished. In fact, some of the activity areas identified at Falcon Landing may represent ephemeral surface structures without formal walls or, alternately, structures for which the postholes did not preserve. Mabry (2008:124–127) excavated several Late Archaic aged activity surfaces at Las Capas in the Tucson Basin, interpreted as living surfaces that lacked a superstructure. These features were all defined by the presence of an oxidized surface of varying sizes. One of which was quite large, over 20 m^3, and included abundant de facto refuse and numerous contemporaneous features.

In general, use of the term "activity area" denotes the presence of some form of functionally specific task performed within well-defined boundaries. For instance, a concentration of thermal pits could be considered an activity area where the specific activity of food processing/preparation occurred. Unfortunately, the activity areas at Luke Solar lack easily recognizable or specific activities that distinguished them from other site areas. The designation of activity areas for the Luke Solar project was predicated on the initial interpretation of a feature as a possible structure. This interpretation was based on the discovery of a particular feature of similar size and shape to other structures identified in the project area. As stated above, once these possible structures were excavated, they were found to contain no evidence of being a structure other than their size and/or shape. It may be that many of the Luke Solar activity areas were ephemeral structures; however, the designation of these features as structures was avoided in order to differentiate aboriginally built structures from specific areas of the site that may have functioned as outdoor work areas. Over the course of fieldwork, many of these activity areas were excavated with the hopes of identifying the location of specific extramural activities or tasks. The inability to assign specific functions to these activity areas is indeed unfortunate and may be the consequence of post-depositional processes and poor preservation.

In some instances, defining the limits of activity areas was challenging in and of itself. Activity areas excavated at Luke Solar also had depth; that is, they contained artifact-bearing sediment directly overlying an aboriginal surface. One exception is Feature 18782, which is included with the activity areas but is defined only as an oxidized surface; therefore, Feature 18782 is considered an activity *surface* rather than an activity *area* due to the lack of identifiable fill above the surface. The identification of an aboriginal surface was also a defining factor of activity areas. Other similarly sized areas of cultural fill were identified at Luke Solar, but these areas did not contain definable aboriginal surfaces, and thus were not considered activity areas. In some instances, this definable aboriginal surface was slightly depressed and suggestive of small extramural areas in which domestic activities occurred with enough frequency or duration for a shallow depression to form through repeated use. This repeated or intensive use also may have accounted for the accumulation of artifact-bearing sediments. The definition of activity areas for Luke Solar therefore was based on specific criteria; however, the specific function or activity performed at each location could not be determined. The author's hope is that each activity area description will be viewed in the context of the natural and cultural environment in the Luke Solar project area. These features—although they do not necessarily follow preconceived notions or parameters of aboriginal activity areas elsewhere—will hopefully stand as an example of the complex and ephemeral nature of Archaic period occupation preserved at Luke Solar.

The following are physical descriptions of all 14 activity areas (including one activity surface) excavated at Falcon Landing (Table 46). Each of the activity-area descriptions has an added section discussing associated features that summarizes both contemporaneous and intrusive features. The discussion of contemporaneous features includes any pit feature that originated at the same level as an activity area and is interpreted as having been used concurrently, as part of the activity area. The discussion of intrusive features includes any pit feature that intruded upon an activity area and is interpreted as having been used after the activity area was abandoned.

Early to Late Archaic Period Component

Feature 1337

Feature type: activity area
Age: Early to Late Archaic period
Locus: Area B
Grid location: B5
Level of effort: complete
Plan-view shape: irregular

Cross-sectional shape: irregular
Length (m): 5.00
Width (m): 4.00
Excavated depth (m): 0.12
Volume (m^3): 2.090
Surface area (m^2): 17.42

Excavation Methods

Feature 1337 was originally identified as an irregularly shaped, organic stain on the surface of MSU 1281, located in the southeastern portion of Falcon Landing (see Appendix A). Based on the feature size, it was initially interpreted as a structure. A 1-by-2-m control unit (TP 6078) was placed near the center of Feature 1337 (Figure 118). TP 6078 was excavated in three levels. The activity area associated with Feature 1337 was not identified in TP 6078 until after the excavation of the control unit, but the bottom of Level 1 roughly corresponds to the fill above the use surface of Feature 1337, and Levels 2 and 3 were excavated below the level of the activity area, into natural sediments (Figure 119). Once the aboriginal use surface was identified in the profile of TP 6078, the remainder of the feature was excavated in two sections, both excavated in one stratigraphic level. SEC 6129 was used to expose the activity area south of TP 6078, and SEC 6133 was used to expose the activity area north of TP 6078 (see Figure 118). The western portion of Feature 1337 was partially eroded by natural channel deposits, and excavation was halted upon identification of this stratigraphic change (see below). An intrusive pit (Feature 6166) was identified during the excavation of SEC 6133. It was partially excavated and left on a pedestal of sediment prior to further excavation of Feature 1337 (see Figure 119). Upon exposure of the entire activity area, six postholes (Features 6176, 6178, 6180, 6182, 6184, and 6186) were found in the approximate center of the activity area, originating at the activity-area use surface (Table 47; see Figure 118).

Feature Fill

The sediments associated with Feature 1337 consisted of a loose to slightly hard, light brown silt loam with sparse charcoal indicative of natural alluvial and aeolian deposits. The surface consisted of compacted natural sediments that included a darker brown silt loam with abundant gravels, cobbles, and calcium carbonate. The western portion of the activity area excavated by SEC 6129 was truncated by natural channel deposits. These deposits had removed the surface of the activity area and consisted of a reddish-brown sandy gravel (see Figure 119). Artifacts recovered from Feature 1337 included 12 pieces of flaked stone debitage and 2 projectile points. One of the projectile points was point-located (PD 6212) on the surface of Feature 1337 (see Figure 118).

Table 46. Activity Areas at Falcon Landing, by Chronologic Group

Feature No.	Level of Effort	Density of Burned Materials in Fill	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
Early to Late Archaic Period												
1337	complete	sparse	5.00	4.00	0.12	2.090	14	—	—	—	14	6.699
Chiricahua Phase												
1303	complete	moderate	5.34	3.74	0.13	1.442	220	9	23	4	256	177.531
7893	complete	abundant	2.95	2.50	0.20	1.656	1	5	—	43	49	29.589
10180	partial	abundant	7.88	3.02	0.24	4.430	—	1	1	—	2	0.903
18782[b]	complete	nonexistent	0.55	0.55	0.03	0.019	—	—	—	—	—	
Middle to Late Archaic Period												
10599	complete	sparse	4.20	40.00	0.28	2.680	18	6	25	76	125	46.642
15082	partial	sparse	2.65	2.50	0.16	0.811	—	12	—	50	62	152.709
Middle Archaic to Pioneer Period												
10095	partial	sparse	3.64	3.00	0.05	0.426	1	—	—	—	1	4.695
Middle Archaic to Protohistoric Period												
10697	partial	nonexistent	3.50	3.00	0.01	0.080	4	2	—	—	6	150.000
Late Archaic to Pioneer Period												
13070	partial	sparse	4.00	2.00	0.21	1.063	19	—	10	133	162	305.085
Late Archaic to Protohistoric Period												
3954	complete	moderate	3.25	3.20	0.18	1.321	3	1	1	—	5	3.785
Cienega Phase												
1239	partial	sparse	3.50	3.50	0.24	2.923	129	1	18	2	150	102.599
Late Cienega to Red Mountain Phase												
14729	complete	moderate	3.10	1.30	0.27	0.408	7	1	7	27	42	102.941
Post–Middle Archaic Period												
15119	complete	sparse	4.44	3.45	0.27	2.930	5	3	3	11	22	7.509

[a] Artifact-density calculations are based on level of effort; therefore, partially excavated features have artifact densities based on the percentages of the features excavated.
[b] Feature 18782 is an activity surface.

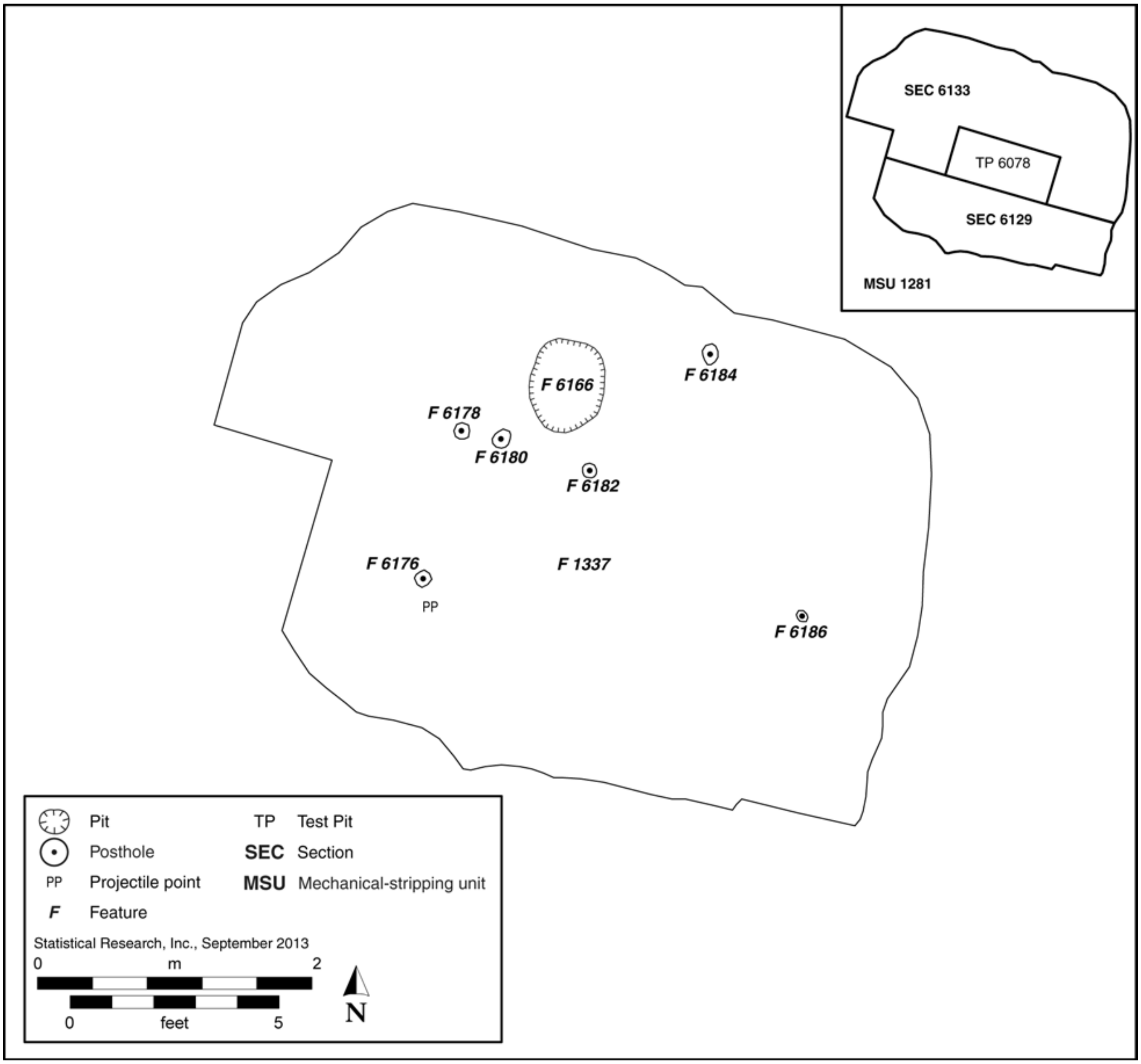

Figure 118. Post-excavation plan view of Feature 1337 (an activity area); Features 6176, 6178, 6180, 6182, 6184, and 6186 (contemporaneous postholes); and Feature 6166 (an intrusive pit) at Falcon Landing.

Figure 119. Photograph of the activity area and contemporaneous postholes associated with Feature 1337 at Falcon Landing, view to the west. Note intrusive pit Feature 6166 in the northwestern corner.

Table 47. Features Associated with Feature 1337 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Nonthermal pit						
6166	circular	basin	0.51	0.5	0.07	intrusive
Posthole						
6176	circular	cylindrical	0.14	0.13	0.06	contemporaneous
6178	circular	cylindrical	0.15	0.14	0.1	contemporaneous
6180	circular	cylindrical	0.17	0.15	0.07	contemporaneous
6182	circular	cylindrical	0.13	0.12	0.06	contemporaneous
6184	circular	cylindrical	0.14	0.14	0.09	contemporaneous
6186	circular	cylindrical	0.1	0.1	0.11	contemporaneous

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
Two Cortaro-style projectile points were recovered from the surface of the activity area, one from SEC 6129 and one from SEC 6133 (see Chapter 3, Volume 2). Cortaro projectile points are associated with the Middle and Late Archaic periods (ca. 3000–350 B.C.); a more-precise temporal placement for this point style has not been established (Roth and Huckell 1992).

Geochronologic Analysis
Feature 1337 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2), placing the feature in the Early to Late Archaic period.

Radiocarbon Samples
None.

Abandonment Processes
The activity area was abandoned and covered with natural alluvial sediments. Two Cortaro points were likely left in place on the activity-area surface prior to abandonment. Following the deposition of natural sediments, a small pit (Feature 6166) was excavated into the fill of Feature 1337.

Stratigraphic Relationships and Surrounding Features
Feature 1337 originated at the surface of Unit I, supporting the Middle to Late Archaic period date associated with the Cortaro projectile points. Several features surrounded Feature 1337 (see Appendix A). A structure (Feature 1498) was located about 1 m to the northeast and was radiocarbon dated to the late Chiricahua phase (1880–1690 cal. B.C.). Another structure (Feature 1313) was about 5 m to the southwest and was dated to the Early to Late Archaic period. A thermal pit (Feature 1315) was located about 1.5 m to the west and was radiocarbon dated to the Early Cienega phase (768–544 cal. B.C.). Other nearby features that were dated to the Early to Late Archaic period included two nonthermal pits (Features 1377 and 1499) located to the northwest. These features all seem to share a common elevation. The presence of two Cortaro projectile points in Feature 1337 suggests that this activity area was contemporaneous with or predated Features 1313 and 1315.

Associated Features
Six postholes (Features 6176, 6178, 6180, 6182, 6184, and 6186) originated on the surface of the activity area (see Table 47). The arrangement of these postholes was not suggestive of a structure wall, because they were mostly located near the approximate center of the activity area (see Figure 118). Instead, the postholes may indicate a small ramada, a windbreak, or some other domestic function, such as drying racks. The six postholes measured 10–17 cm in diameter and 6–11 cm in depth. None of postholes contained burned materials or artifacts.

Feature 6166 was intrusive to the activity area (Feature 1337), originating approximately 5 cm above the activity-area surface (see Figure 119). It was a circular, basin-shaped nonthermal pit with small amounts of charcoal, ash, and FAR (see Table 47). No artifacts were present in Feature 6166.

Chiricahua Phase Component

Feature 1303

Feature type: activity area
Age: Chiricahua phase
Locus: Area B
Grid location: B4
Level of effort: complete
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 5.34
Width (m): 3.74
Excavated depth (m): 0.13
Volume (m^3): 1.442
Surface area (m^2): 20.11

Excavation Methods

Feature 1303 was originally identified in the northern profile of TR 1230, in the southern portion of Falcon Landing (see Appendix A). Feature 1303 was originally interpreted as a structure, based on the trench profile, and was further defined in plan view during mechanical stripping of MSU 1281. A 1-by-1-m control unit (TP 5418) was placed in the southern portion of the inferred feature boundary (Figure 120) and was excavated in two levels. Level 1 of TP 5418 was an arbitrary 10-cm level, and Level 2 was excavated approximately 3–5 cm before reaching a compact use surface. In order to identify the areal extent of the use surface, HSU 5424 was used to excavate the remaining sediments off the top of the surface (see Figure 120). The HSU was excavated in one arbitrary level, to the surface identified in TP 5418. The limits of HSU 5424 were defined by the presence of cultural fill (described below), and the outer edges of the HSU were slightly overexcavated in order to fully expose the activity area surface. All sediments were worked through a 1/4-inch screen. Four nonthermal pits (Features 5427, 5428, 5429, and 5582) originated at the activity-area surface (Table 48; see Figure 120) and were considered contemporaneous with the activity area. All four pits were excavated.

Feature Fill

The sediments associated with Feature 1303 consisted of a loose, dark brown silt loam containing moderate amounts of charcoal flecking and FAR throughout. The surface associated with Feature 1303 consisted of a compacted, blocky silt loam with calcium-carbonate formations (Figure 121). Artifacts from Feature 1303 included 216 pieces of flaked stone debitage, 23 pieces of faunal bone, 6 manos (3 complete and 3 fragments), 4 pieces of FAR, 3 pieces of indeterminate ground stone, a drill, 2 edge-modified flakes, and a side scraper.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 1303 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A point-provenienced radiocarbon sample was collected from the trench profile of Feature 1303, and an unknown piece of charred plant material was submitted to Aeon for AMS dating. The charcoal produced a 2σ date of 2480–2340 cal. B.C. (Aeon Sample No. 680), placing it in the Chiricahua phase of the Middle Archaic period.

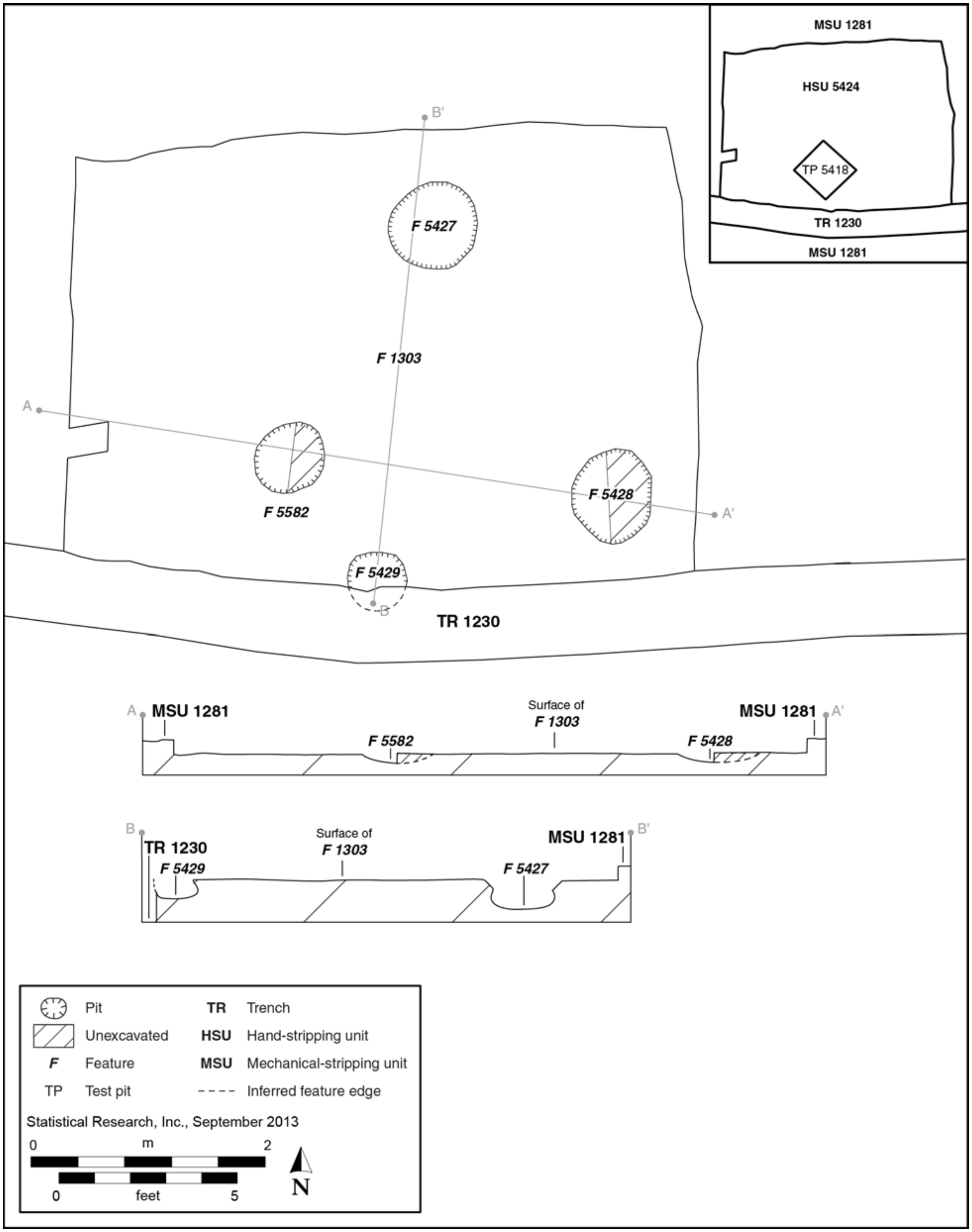

Figure 120. Post-excavation plan view and cross sections of Feature 1303 (an activity area) and Features 5427, 5428, 5429, and 5582 (contemporaneous pits) at Falcon Landing.

Table 48. Features Associated with Feature 1303 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Nonthermal pit						
5427	circular	bell shaped	0.66	0.65	0.24	contemporaneous
5428	circular	basin	0.80	0.70	0.08	contemporaneous
5429	circular	bell shaped	0.50	0.48	0.20	contemporaneous
5582	circular	basin	0.60	0.60	0.07	contemporaneous

Figure 121. Photograph of the activity area and the contemporaneous pits associated with Feature 1303 at Falcon Landing, view to the south.

Abandonment Processes

The activity area was likely abandoned and covered by natural alluvium. The fill associated with Feature 1303 is attributed to cultural debris that accumulated as intentionally deposited refuse or slowly, throughout the use of the surrounding site.

Stratigraphic Relationships and Surrounding Features

Several features surrounded Feature 1303 (see Appendix A). An activity area (Feature 1239) was located about 1 m to the east but postdated the use of Feature 1303. A structure (Feature 1290) was located about 6 m to the west and also postdated the use of Feature 1303; it was radiocarbon dated to the Snaketown phase of the Pioneer period (ca. A.D. 610–670). Other surrounding features included six nonthermal pits (Features 1240, 1297, 1305, 1306, 1339, and 1472) and two thermal pits (Features 1299 and 1300). Feature 1297 was dated to the Cienega phase, and the other aforementioned features were dated to the Early to Late Archaic period.

Associated Features

Four features were associated with the activity area (see Figure 120; Table 48). Features 5427, 5428, 5429, and 5582 all originated at the use surface of Feature 1303 and are considered contemporaneous with it. Feature 5427 was a circular, bell-shaped nonthermal pit that contained two pieces of faunal bone and one piece of flaked stone debitage. No burned material was observed in the pit. Features 5428 and 5582 were circular, basin-shaped nonthermal pits that contained no burned materials or artifacts. Feature 5429 was a circular, bell-shaped nonthermal pit that contained no artifacts or burned materials.

Feature 7893

Feature type: activity area
Age: Chiricahua phase
Locus: Area A
Grid location: I5
Level of effort: complete
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 2.95
Width (m): 2.50
Excavated depth (m): 0.20
Volume (m^3): 1.656
Surface area (m^2): 9.51

Excavation Methods

Feature 7893 was identified in MSU 4630 as a large, irregularly shaped activity area consisting of charcoal and ash (see Appendix A). It was then defined in the profile of HTs 7677 and 8469. Both HTs also revealed several pit features in profile (Feature 4650, 7685, 7885, and 8414) (Figure 122; Table 49). The sediments associated with the activity area were excavated next, in two arbitrary sections; SEC 7894 was used to excavated the eastern half, and SEC 7896 was used to excavate the western half. Both sections over-excavated the irregularly shaped activity area to some degree (see Figure 122). One extramural pit (Feature 7685) was identified as intrusive to the activity area and was completely excavated prior to completing the sections. Both sections ended upon reaching a compact earthen use surface. Four pits were found to originate at the surface (Features 4650, 7813, 7883, and 7884), and one pit (Feature 8414) underlay the surface (see Figure 122; Table 49). Each associated feature was excavated in a controlled manner, following the excavation of Feature 7893 (Figure 123).

Feature Fill

The sediments associated with Feature 7893 consisted of a soft silt loam with abundant charcoal throughout, as well as a few pieces of FAR. The use surface of Feature 7893 consisted of a compact silt loam with calcium carbonate and charcoal staining. This surface corresponds to the natural sediments associated with Unit IIA. Artifacts associated with Feature 7893 included 43 pieces of FAR, 3 mano fragments, 2 metate fragments, and 1 piece of flaked stone debitage.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

<u>**Diagnostic Material Culture**</u>

None.

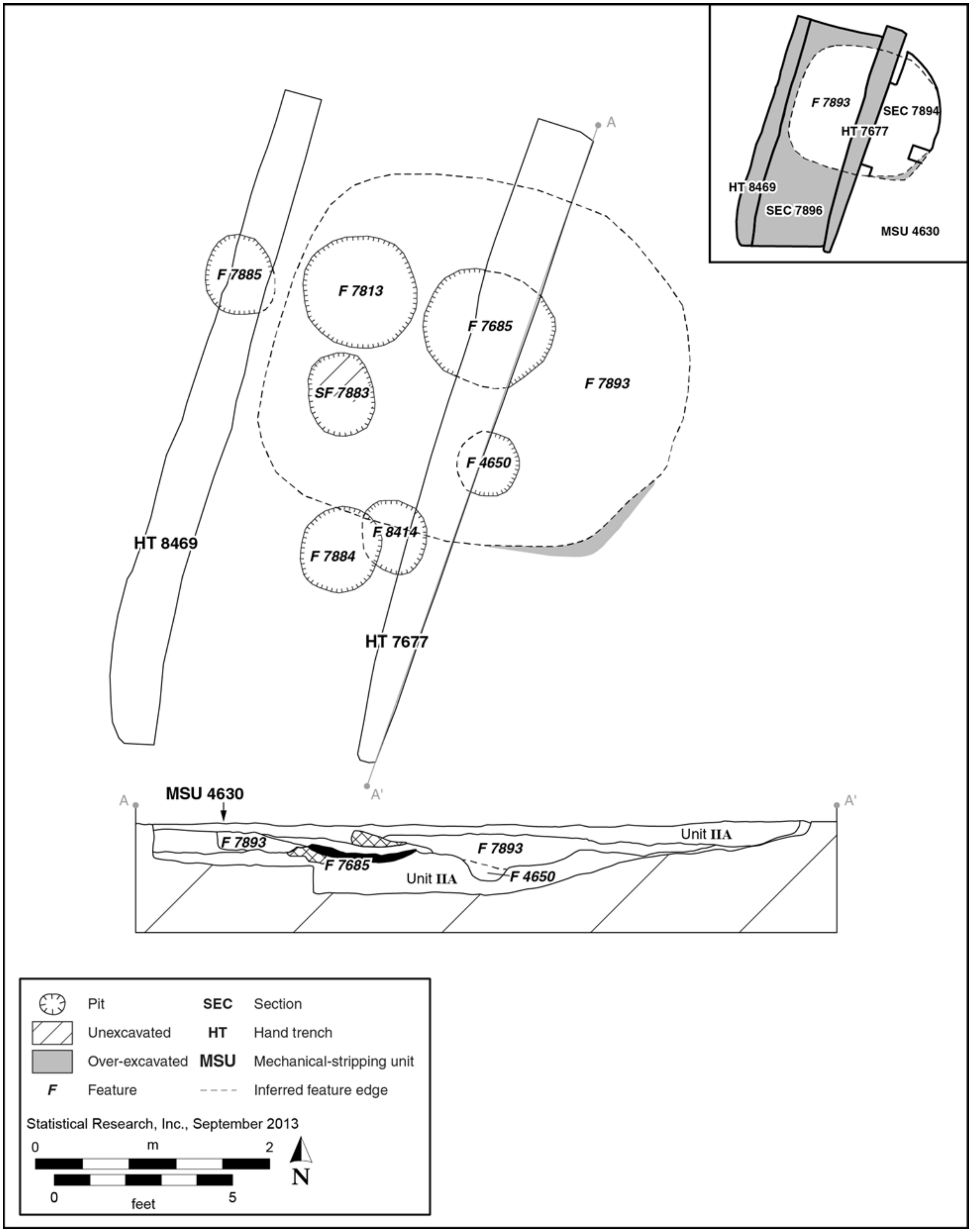

Figure 122. Mid-excavation plan view and cross sections of Features 7893 (an activity area), 4650 (a contemporaneous pit), and 7685 (an intrusive pit) at Falcon Landing. The relationship among Features 7813, 7883, 7884, and 7885 (contemporaneous pits) and Feature 8414 (an underlying pit) is also shown in the plan view.

Table 49. Features Associated with Feature 7893 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Nonthermal pit						
4650	circular	basin	0.56	0.52	0.23	contemporaneous
7883	circular	basin	0.66	0.51	0.18	contemporaneous
7884	circular	basin	0.70	0.65	0.14	contemporaneous
7885	circular	basin	0.48	0.38	0.10	contemporaneous
8414	circular	basin	0.70	0.64	0.14	underlying
Thermal pit						
7685	circular	basin	1.11	0.96	0.21	intrusive
7813	circular	basin	0.99	0.99	0.20	contemporaneous

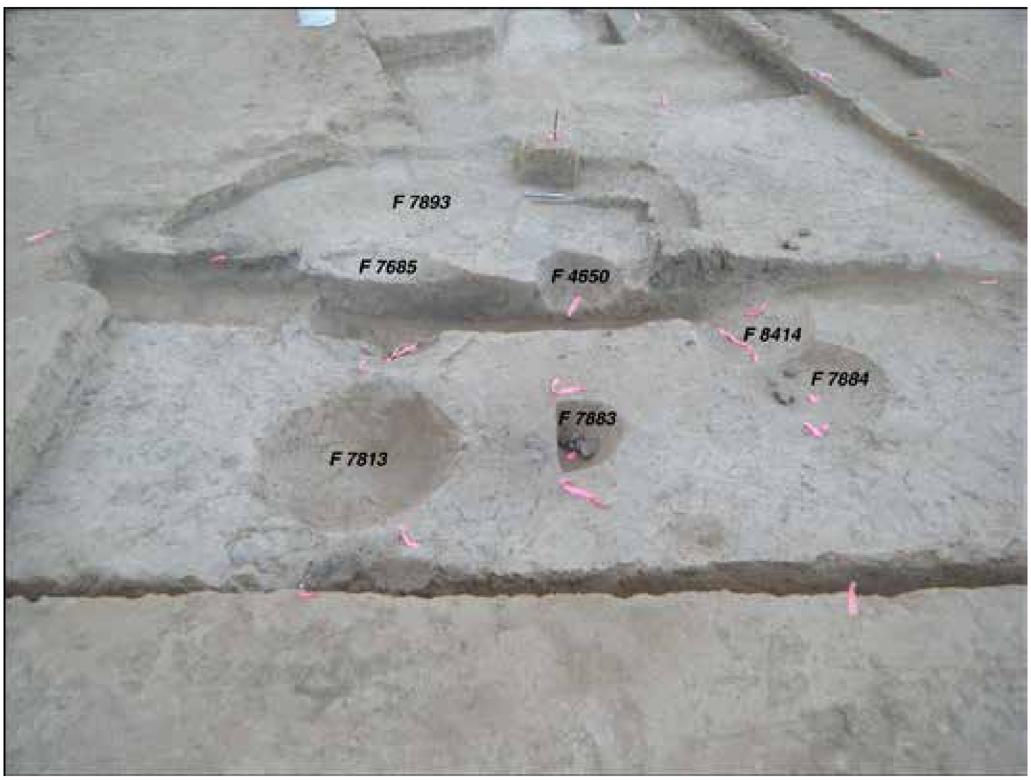

Figure 123. Post-excavation photograph of Feature 7893 (an activity area) at Falcon Landing, including contemporaneous pit Features 4650, 7813, 7883, 7884, and 7885; intrusive pit Feature 7685; and underlying pit Feature 8414, view to the east.

Geochronologic Analysis

Feature 7893 was located within Unit IIA, the bracketing age range of which is 2810–2420 cal. B.C. (see Chapter 2, Volume 2), placing the feature in the Chiricahua phase of the Middle Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

The number of extramural pits that originated at various elevations within Feature 7893 and the abundant charcoal and ash associated with the feature suggest that the activity area was reused multiple times. The charcoal-rich fill overlying Feature 7893 was likely the result of multiple episodes of refuse disposal or intensive use of the surrounding area. The activity area was later buried by natural alluvial sediments.

Stratigraphic Relationships and Surrounding Features

Numerous features surrounded Feature 7893 (see Appendix A). Nearby contemporaneous features included two nonthermal pits (Features 4646 and 4647) and one FAR concentration (Feature 8449). A cluster of Chiricahua phase–aged features located 1–6 m to the southeast included five nonthermal pits (Features 8422, 8423, 8494, 9451, and 18467), three FAR concentrations (Features 7986, 9475, and 9745), two thermal pits (Features 7998 and 8497), and one possible structure (Feature 2602).

Associated Features

Three pit features (Features 4650, 7813, and 7883) that originated at the surface of the activity area are interpreted as contemporaneous (see Figure 122; Table 49). Feature 4650 was a circular, basin-shaped nonthermal pit that contained abundant charcoal and 21 pieces of FAR. None of the FAR was collected, and no other artifacts were present. Feature 7813 was a circular, basin-shaped thermal pit that contained 21 pieces of FAR, 7 manos (3 complete), 6 metate fragments, and a hammerstone. Feature 7883 was a circular, basin-shaped nonthermal pit that contained moderate amounts of charcoal, ash, and oxidized sediment. Five pieces of FAR were also present. Two other pits (Feature 7884 and 7885) were in the same stratigraphic position as Feature 7893 and were likely contemporaneous with the activity area, but their exact relationship to it is unknown.

Stratigraphic information indicates that Feature 7685 likely predated the activity area (see Figure 122). Feature 7685 was a circular, basin-shaped thermal pit that contained abundant charcoal and FAR (see Table 49). The edges and base of the pit were oxidized. In total, 52 pieces of FAR were identified during excavation but were not collected. An indeterminate ground stone fragment and a mano fragment were collected.

A single pit feature (Feature 8414) was found to underlie activity-area Feature 7893, based on the western profile of HT 7677. Feature 8414 was a circular, basin-shaped nonthermal pit that contained moderate amounts of charcoal and four pieces of faunal bone (see Table 49).

Feature 10180

Feature type: activity area
Age: Chiricahua phase
Locus: Area B
Grid location: D5
Level of effort: partial
Plan-view shape: indeterminate
Cross-sectional shape: irregular
Length (m): 7.88
Width (m): 3.02
Excavated depth (m): 0.24
Volume (m^3): 4.430
Surface area (m^2): 16.72

Excavation Methods

Feature 10180 was identified during intersite trenching, in the profile of TR 10047 (see Appendix A). It appeared as a deposit of charcoal and ash-laden sediments that possibly represented the remains of a pit structure and was further defined in plan view during mechanical excavation of MSU 3209, located in the northeastern corner of Area B. Two 1-by-1-m control units (TPs 8622 and 8630) were excavated in Feature 10180.

TP 8622 was placed along the southern side of TR 10047, and TP 8630 was placed along the northern side (Figure 124). Level 1 in both control units was excavated in an arbitrary 10-cm level, and Level 2 was excavated as a stratigraphic layer that terminated at the surface of the activity area. Once the activity area was identified in both control units, the remainder of the feature was excavated in two sections. SEC 3357 was used to excavate Feature 10180 along the northern side of TR 10047 and SEC 8677 was used to excavate the feature on the southern side of the trench (see Figure 124). SEC 3357 was excavated in two arbitrary 10-cm-deep levels and one stratigraphic level, to the activity-area surface. During the excavation of SEC 3357, an intrusive pit feature (Feature 3365) (Table 50) was identified in the fill above the activity area (see Figure 124). This feature was completely excavated, documented, and removed before excavation of Feature 10180 resumed. Upon reaching the surface of Feature 10180 in SEC 3357, two patches of oxidation, a nonthermal pit (Feature 8771), and a basin-metate fragment were identified. The metate was point-located (PD 8650), Feature 8771 was completely excavated, and the area was mapped in plan view (see Figure 124). Next, SEC 8677 was excavated in two levels, one arbitrary 10-cm level (Level 1) and one level (Level 2) that was ended upon reaching the surface of the activity area. Upon reaching the surface of Feature 10180 in SEC 8677, four patches of oxidation and ash were identified. No additional features associated with the surface were found. A pollen sample was collected from the surface of Feature 10180 and submitted for further analysis (see Chapter 7, Volume 2).

Feature Fill
Two distinct strata were associated with Feature 10180. The upper layer consisted of a compact, pale-brown silt loam with little to no charcoal interpreted as natural alluvial and aeolian sediments. The lower layer consisted of a similar silt loam with abundant charcoal, ash, and oxidized sediment. The lower layer rested atop the surface of the activity area. The activity area was characterized as a compacted use surface consisting of the natural sediments and occasional patches of oxidized or ash-stained sediment. Other than the basin-metate fragment uncovered in SEC 3357, the only artifact recovered from Feature 10180 was one piece of faunal bone recovered from the fill of SEC 8677.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 10180 was located at the surface of Unit II, with Unit IIA overlying it. The unconformity between the surface of Unit II and Unit IIA provides a geochronologic date of ca. 2810–2730 cal. B.C. (see Chapter 2, Volume 2), placing the feature in the Chiricahua phase.

Radiocarbon Analysis
None.

Abandonment Processes
The amount of charcoal, ash, and oxidized sediment in the lower fill of the activity area and the oxidized and ash-stained patches on the activity-area surface suggest that the feature burned or was abandoned and, soon after, had refuse deposited directly over its surface. Following the burning or the refuse disposal, the activity area was covered by natural alluvial and aeolian sediments. At some point after abandonment of the activity area, a nonthermal pit (Feature 3365) was excavated into the fill above the activity area (see Figure 124). Feature 3365 was also then abandoned and covered with natural alluvial sediments.

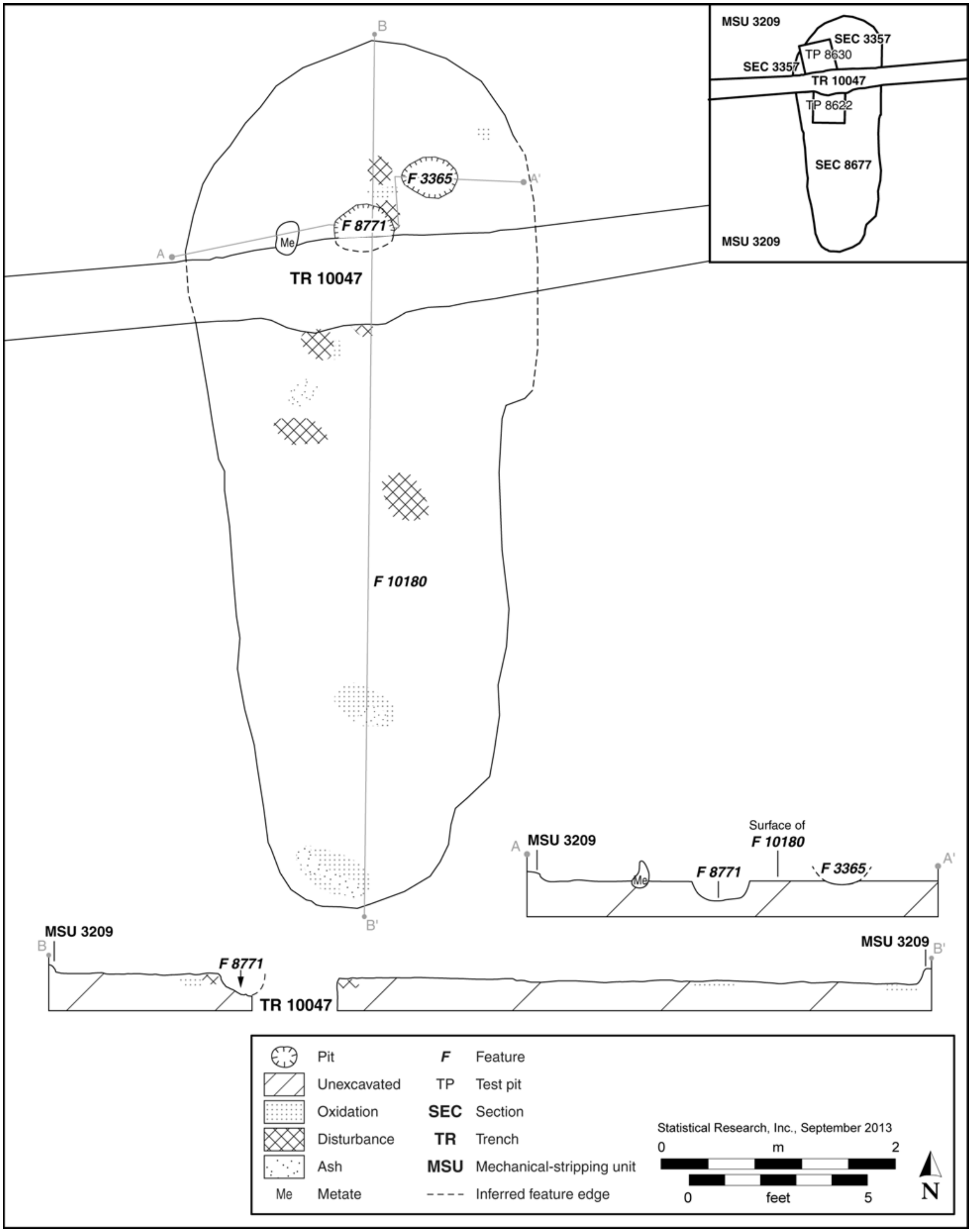

Figure 124. Post-excavation plan view and cross sections of Feature 10180 (an activity area), 8771 (a contemporaneous pit), and 3365 (an intrusive pit) at Falcon Landing.

Table 50. Features Associated with Feature 10180 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Nonthermal pit						
3365	ovate	basin	0.49	0.37	0.20	intrusive
8771	indeterminate	basin	0.70	0.40	0.18	contemporaneous

Stratigraphic Relationships and Surrounding Features

Feature 10180 originated at the surface of Unit II, indicating that it is associated with Middle Archaic period occupation of the site. Four nonthermal pits (Features 3211, 3212, 3215, and 3217) surrounded Feature 10180 and are considered to be contemporaneous (see Appendix A). Another nearby nonthermal pit (Feature 3214) was dated to the Middle Archaic to Pioneer period.

Associated Features

One pit feature originated on the use surface of Feature 10180 and is considered to be contemporaneous. Feature 8771 was a basin-shaped nonthermal pit that was partially truncated by TR 10047 (see Table 50; Figure 124). One piece of flaked stone debitage was recovered from the pit.

One pit feature was intrusive to the activity area: Feature 3365, an ovate, basin-shaped nonthermal pit that originated approximately 0.2 m above the activity-area surface (see Table 50). The base of Feature 3365 slightly intruded the activity area. No artifacts were present in Feature 3365 (see Figure 124).

Feature 18782

Feature type: activity surface
Age: Chiricahua phase
Locus: Area A
Grid location: J3
Level of effort: complete
Plan-view shape: indeterminate
Cross-sectional shape: surface only
Length (m): 0.55
Width (m): 0.55
Excavated depth (m): 0.03
Volume (m^3): 0.019
Surface area (m^2): indeterminate

Excavation Methods

Feature 18782 was an activity surface located in the northwestern corner of Area A (see Appendix A). It was identified as an oxidized surface in the eastern profile of TR 13836, directly below a deposit of charcoal-stained sediments (Feature 10951) (Figure 125). Following in-field analysis by the project geoarchaeologist, Feature 10951 was interpreted as having resulted from the mixing of cultural materials and alluvial deposits. Feature 10951 was then deemed a noncultural feature.

TR 13836 removed the western portion of Feature 18782; therefore, the plan-view shape of the activity surface could not be established. HSUs 18780 and 19079 were placed along the edge of TR 13836 and were excavated through Feature 19051 in order to define the extent of Feature 18782. HSU 18780 was located over the northern portion of Feature 18782 and measured 1.4 by 0.66 m, and HSU 19079 was located over the southern portion and measured 1.3 by 0.75 m. Both HSUs were excavated through the charcoal-stained sediments associated with Feature 10951, in one arbitrary level. The base of Level 1 encountered the oxidized surface corresponding to Feature 18782.

Feature Fill

No fill was attributed to Feature 18782, because the feature consisted of an oxidized surface. The oxidation was located on unmodified natural sediments and evidenced moderate amounts of rodent and insect activity. No artifacts were associated with the oxidized surface.

Evidence of Remodeling

No evidence of remodeling was observed.

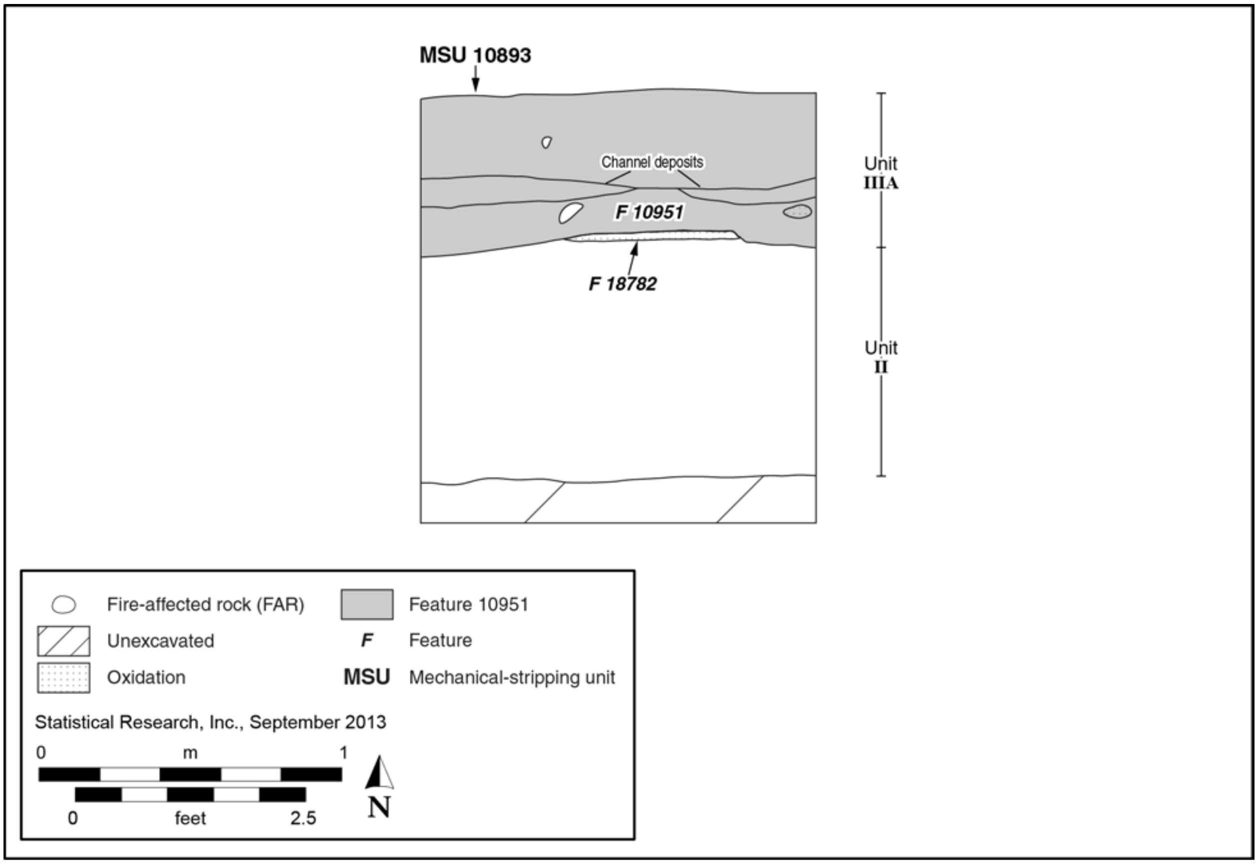

Figure 125. Profile of Features 18782 (an activity area) and 10951 (overlying cultural materials mixed with alluvial deposits), in the eastern wall of TR 13836, at Falcon Landing.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 18782 was located at the surface of Unit II, with the over-thickened Unit IIA soil horizon overlying it. The unconformity between the surface of Unit II and Unit IIA is ca. 2810–2730 cal. B.C. (see Chapter 2, Volume 2), placing it within the Chiricahua phase.

Radiocarbon Analysis

None.

Abandonment Processes

Feature 18782 corresponds to an oxidized surface. It is unclear what caused the oxidized sediments, but the lack of a definable pit may indicate that materials were burned on a flat surface. The activity surface was then abandoned and covered with the charcoal-rich alluvial deposits associated with Feature 10951.

Stratigraphic Relationships and Surrounding Features

Feature 18782 underlay a large, charcoal-rich deposit associated with Feature 10951 (see Figure 125). Two nearby pits, Features 10925 and 18439, aided in bracketing the age of Feature 18782 (see Appendix A). An extramural pit (Feature 10925) located at the top of the charcoal deposit was radiocarbon dated to ca. 2870–2570 cal. B.C. An extramural pit (Feature 18439) located below the charcoal deposit was radiocarbon dated to ca. 2880–2610 cal. B.C. Because Feature 18782 was below the charcoal deposit, the above dates suggest that Feature 18782 was contemporaneous with Feature 18439, their dates corresponding to the Middle Archaic period.

Associated Features

No features were intrusive, and none originated at the oxidized surface associated with the activity area.

Middle to Late Archaic Period Component

Feature 10599

Feature type: activity area
Age: Middle to Late Archaic period
Locus: Area A
Grid location: I4
Level of effort: complete
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 4.20
Width (m): 4.00
Excavated depth (m): 0.28
Volume (m^3): 2.680
Surface area (m^2): 9.57

Excavation Methods

Feature 10599 was identified during the mechanical excavation of MSU 10588 as a large, irregularly shaped, organic stain containing charcoal and ash (see Appendix A). It had been truncated on its northern end by TR 2217 (Figure 126). The feature was initially interpreted as a possible structure, and a 1-by-2-m control unit (TP 14287) was placed near the center. TP 14287 was excavated in two arbitrary 10-cm levels, and Level 2 reached a use surface. Once the use surface was identified in TP 14287, the remainder of the surface was uncovered with two sections. SEC 16664 represented the southeastern portion of Feature 10599, and SEC 16912 represented the northwestern portion (see Figure 126). A pollen sample was collected from the surface and submitted for further analysis. Three intrusive pit features were identified during the excavation of the sections (Table 51): Features 16674 and 16760, identified in SEC 16664, and Feature 16751, identified in SEC 16912. All three intrusive features were excavated in a controlled manner before excavation of Feature 10599 continued (Figure 127).

Feature Fill

The sediments associated with Feature 10599 consisted of a loose to moderately hard, yellowish brown silty clay loam. Sparse charcoal fragments were present. The surface of the activity area consisted of the compacted substrate. In total, 125 artifacts were recovered: 74 pieces of FAR, 25 pieces of faunal bone, 17 pieces of flaked stone debitage, 4 indeterminate ground stone fragments, 2 cobble manuports, a biface, a mano fragment, and a metate fragment. No artifacts were found in contact with the Feature 10599 use surface.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

<u>Diagnostic Material Culture</u>
None.

<u>Geochronologic Analysis</u>
Feature 10599 was located within Unit IIs/sf. The bracketing age range for Unit IIs/sf is ca. 2540–790 cal. B.C. (see Chapter 2, Volume 2), placing this feature within the Middle to Late Archaic period.

<u>Radiocarbon Analysis</u>
None.

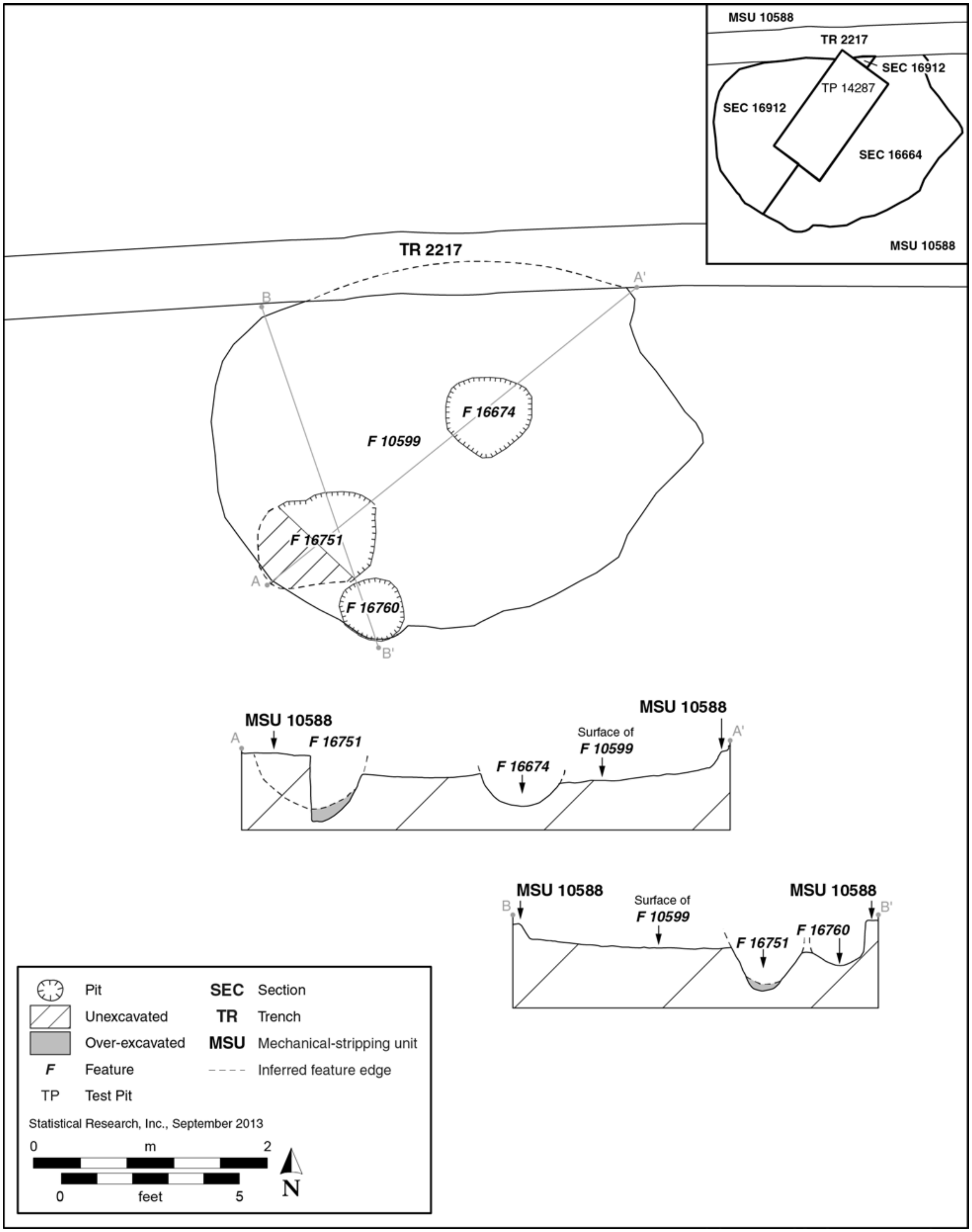

Figure 126. Post-excavation plan view and cross sections of Feature 10599 (an activity area) and Features 16674, 16751, and 16760 (intrusive features) at Falcon Landing.

Table 51. Features Associated with Feature 10599 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Nonthermal pit						
16751	circular	basin	0.91	0.71	0.46	intrusive
16760	circular	conical	0.52	0.46	0.31	intrusive
Thermal pit						
16674	circular	conical	0.70	0.66	0.36	intrusive

Figure 127. Photograph of Feature 10599 at Falcon Landing showing intrusive features, view to the west.

Abandonment Processes

The activity area was abandoned and covered with natural alluvial and aeolian deposits. The number of artifacts in the fill indicates that the abandoned activity area was also used to deposit refuse from other areas of the site. The natural and intentional deposits may have occurred concurrently. Sometime after abandonment, three pit features were excavated into the fill above the activity area (see Figure 126). These three features were later abandoned and became covered with natural alluvial and aeolian deposits.

Stratigraphic Relationships and Surrounding Features

Feature 10599 originated within Unit IIs/sf, suggesting that it is Middle to Late Archaic period in age. Three nearby nonthermal pits are considered contemporaneous with Feature 10599: Features 10597, 10608, and 10610 (see Appendix A).

Associated Features
Three pit features intrude on the activity area (see Table 51). Features 16674, 16751, and 16760 were built into the fill overlying Feature 10599, and all three pits truncated the activity-area surface (see Figure 126). Feature 16674 was a circular, conical-shaped thermal pit with moderate amounts of charcoal, ash, and oxidized sediments. Artifacts recovered from Feature 16674 included 21 pieces of FAR, 5 pieces of faunal bone, and 1 piece of flaked stone debitage. Feature 16760 was a circular, conical-shaped nonthermal pit with moderate amounts of charcoal and ash. Artifacts recovered from Feature 16760 included 13 pieces of FAR, 7 pieces of faunal bone, and 1 indeterminate ground stone fragment. Feature 16751 was a circular, basin-shaped nonthermal pit with sparse charcoal. Artifacts recovered from Feature 16751 included 22 pieces of FAR, 1 piece of faunal bone, 1 piece of flaked stone debitage, and 1 indeterminate ground stone fragment. The amount of burned material and the number of artifacts in the fill of these pits suggest that they were similarly filled with refuse following their disuse.

Feature 15082
Feature type: activity area
Age: Middle to Late Archaic period
Locus: Area B
Grid location: E2
Level of effort: partial
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 2.65
Width (m): 2.50
Excavated depth (m): 0.16
Volume (m^3): 0.811
Surface area (m^2): 5.78

Excavation Methods
Feature 15082 was originally identified during the excavation of MSU 15068, located in the central portion of Area B (see Appendix A). It appeared on the stripped surface as an irregularly shaped, organic stain containing charcoal and ash. A 1-by-1-m control unit (TP 17053) was placed within the boundary of Feature 15082 (see Figure 53). TP 17053 was excavated in two arbitrary 10-cm levels. The surface associated with the activity area existed approximately 5 cm below the top of Level 1, but the ephemeral nature of the surface made initial identification difficult. After the excavation of Level 2, the walls of TP 17053 were examined, and a subtle change in stratigraphy was noted. The stratigraphic change corresponded to the surface of the activity area. HSU 17396 was excavated around TP 17053 in order to define the activity area in plan view. A surface associated with Feature 15082 was exposed in HSU 17396, as well as a contemporaneous structure (Feature 17681) and two extramural pits intrusive to the structure (Features 15083 and 17253) (see Figure 53).

Feature Fill
The fill sediments of Feature 15082 consisted of a soft, yellowish brown silt loam with fine sand and sparse charcoal fragments. The surface of the activity area consisted of the compacted natural substrate, with calcium-carbonate filaments. Artifacts recovered from Feature 15082 included 50 pieces of FAR, 2 metate fragments, 2 mano fragments, 1 complete mano, and 7 indeterminate ground stone fragments.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

<u>Diagnostic Material Culture</u>
None.

<u>Geochronologic Analysis</u>
Feature 15082 was located within Unit III1. The bracketing age range for Unit III1 is ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2), placing the feature in the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The sediments associated with the fill of Feature 15082 suggest that the activity area was abandoned and became covered with natural alluvial and aeolian sediments. Artifacts and sparse charcoal in the fill suggest that some amount of refuse was also intentionally deposited over the abandoned activity area.

Stratigraphic Relationships and Surrounding Features
One structure (Feature 17681) and two extramural pits (Features 15083 and 17253) were located near Feature 15082 (see Figure 53). Feature 17681 is considered to be contemporaneous. The boundary of Feature 15083 suggests that the activity area functioned as an extramural surface immediately adjacent to or surrounding the structure. Both Features 15083 and 17253 were intrusive to Feature 17681; therefore, they also postdate the use of the activity area.

Associated Features
Other than the structure (Feature 17681), no features were in direct contact with the activity area.

Middle Archaic to Pioneer Period Component

Feature 10095

Feature type: activity area
Age: Middle Archaic to Pioneer period
Locus: Area B
Grid location: E1
Level of effort: partial
Plan-view shape: indeterminate
Cross-sectional shape: irregular
Length (m): 3.64
Width (m): 3.00
Excavated depth (m): 0.05
Volume (m^3): 0.426
Surface area (m^2): 9.61

Excavation Methods
Feature 10095 was originally identified in both profiles of TR 10024 during the intersite-testing phase, and it was interpreted as a structure (see Appendix A). Feature 10095 was later defined in plan view in MSU 3162, located in the west-central portion of Area B. Once the feature had been defined in plan view, a portion of TR 10024 was reexcavated by hand in order to reestablish Feature 10095 in profile. A control unit (TP 8204) was placed in the approximate center of the feature, along the northern side of TR 10024 (Figure 128). TP 8204 was excavated in one stratigraphic level that was approximately 0.06 m thick and ended at a compact use surface. The remainder of Feature 10095 that was on the northern end of TR 10024 was excavated as SEC 8212, and the remaining portion of Feature 10095 on the southern side of the trench was excavated as SEC 8214 (Figure 129). Upon exposure of the surface, two pits (Features 8220 and 8233) were identified, and a third pit (Feature 8221) was found to be intrusive to the activity area (Table 52; see Figure 128). All three features were excavated in a controlled manner.

Feature Fill
The sediments associated with Feature 10095 consisted of a loose, brown silt loam containing sparse charcoal fragments throughout. The use surface consisted of a compact silt loam with small amounts of calcium carbonate. One piece of flaked stone debitage was recovered from Feature 10095.

Evidence of Remodeling
No evidence of remodeling was observed.

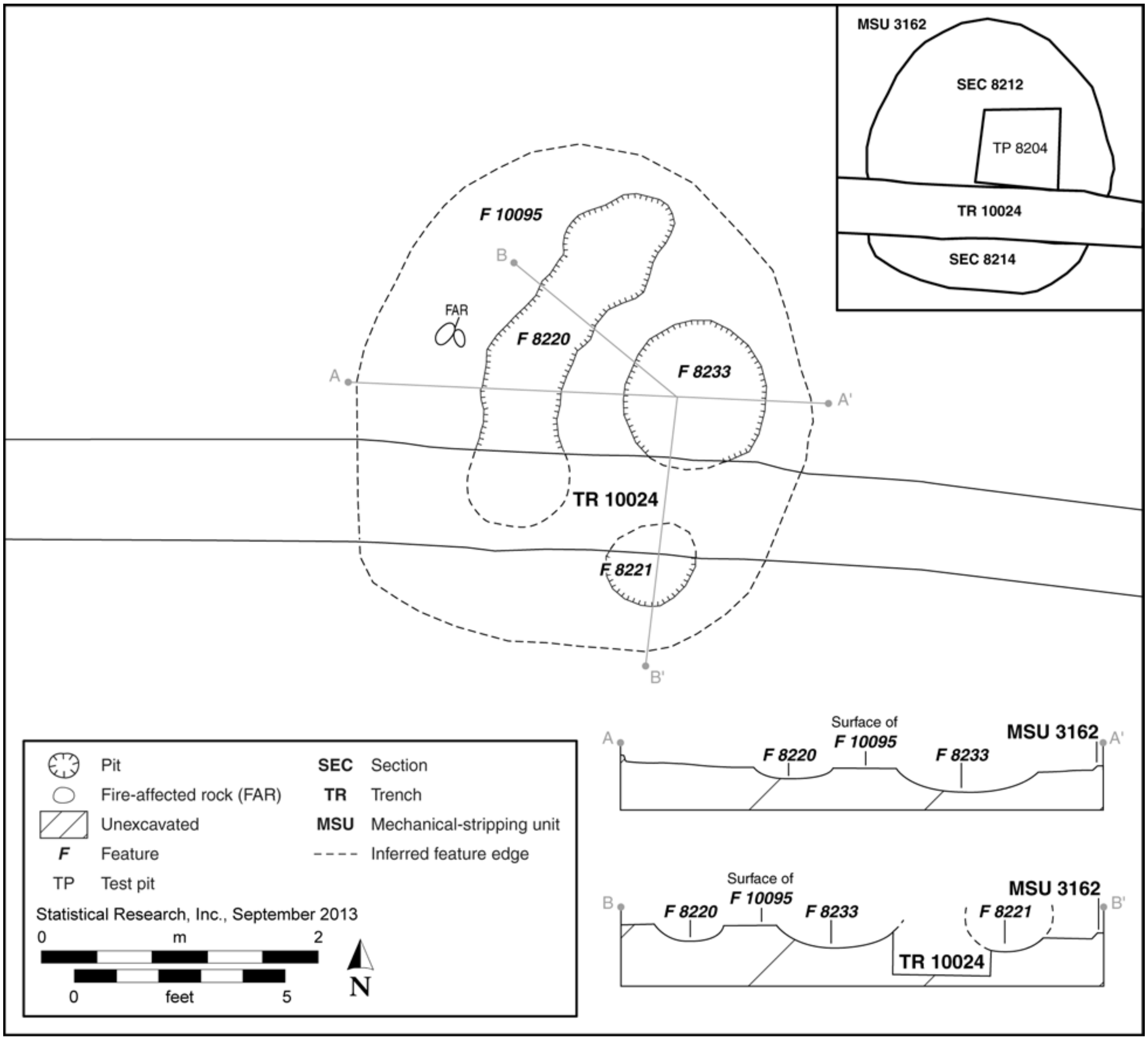

Figure 128. Post-excavation plan view and cross sections of Feature 10095 (an activity area), Features 8220 and 8233 (contemporaneous pits), and Feature 8221 (an intrusive pit) at Falcon Landing.

Figure 129. Photograph of Feature 10095 at Falcon Landing, view to the south. Note unexcavated contemporaneous pit Features 8220 and 8233 in the foreground.

Table 52. Features Associated with Feature 10095 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Thermal pit						
8220	irregular	irregular	1.90	0.60	0.12	contemporaneous
8221	ovate	basin	0.60	0.44	0.08	intrusive
8233	circular	basin	0.96	0.90	0.16	contemporaneous

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 10095 was located at the surface of Unit II, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the surface of Unit II and Unit IV provides a geochronologic date of ca. 2730 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), placing it in the Middle Archaic to Pioneer period.

Radiocarbon Analysis
None.

Abandonment Processes

The activity area was abandoned and filled with naturally occurring alluvial sediments. A small amount of charcoal was present in the fill of Feature 10095, suggesting that the charcoal was transported by natural processes during the infilling of the feature. Sometime after abandonment of Feature 10095, Feature 8221 was excavated into its fill (see Figure 128).

Stratigraphic Relationships and Surrounding Features

Few features surrounded Feature 10095 (see Appendix A). Located about 10 m to the west were two contemporaneous features: a nonthermal pit (Features 3194) and an FAR concentration (Feature 11356). Nearby features dated to the Chiricahua phase included three nonthermal pits (Features 11357, 11358, and 11362).

Associated Features

Two pit features are associated with the activity area. Features 8220 and 8233 both originated at the surface of the activity area and are considered contemporaneous with Feature 10095 (see Figure 128; Table 52). Feature 8220 was a long, irregularly shaped thermal pit with charcoal, ash, oxidation, and one piece of FAR. A single piece of flaked stone debitage was also present in the fill. Feature 8233 was a circular, basin-shaped thermal pit with moderate amounts of charcoal, ash, oxidized sediment, and FAR. Artifacts from Feature 8233 included 23 pieces of FAR, 11 metate fragments, 1 mano fragment, and 2 indeterminate ground stone fragments.

A single pit feature (Feature 8221) was intrusive to the activity area (see Figure 128; Table 52). Feature 8221 was an ovate, basin-shaped thermal pit located south of TR 10024. It contained sparse charcoal and FAR. A single piece of flaked stone debitage was recovered from the feature.

Middle Archaic to Protohistoric Period Component

Feature 10697

Feature type: activity area
Age: Middle Archaic to Protohistoric period
Locus: Area A
Grid location: H5
Level of effort: partial
Plan-view shape: indeterminate
Cross-sectional shape: indeterminate
Length (m): 3.50
Width (m): 3.00
Excavated depth (m): 0.01
Volume (m^3): 0.080
Surface area (m^2): indeterminate

Excavation Methods

Feature 10697 was originally identified during mechanical excavations of MSU 10588. A 1-by-2-m control unit (TP 12431) was placed in the approximate center of Feature 10697, and it was excavated in two arbitrary 10-cm levels (see Appendix A). Once the base of Level 2 was reached, it was apparent that the excavated sediments corresponded to natural deposits, not cultural fill. The sidewall profile of TP 12431 was then investigated, and a 1-cm-thick cultural deposit was identified at the top of the profile, in Level 1. No further excavations were performed on Feature 10697. Because the feature was not further excavated, no plan-view or cross-section maps were produced.

Feature Fill

The sediment associated with Feature 10697 consisted of a 1-cm-thick, slightly hard, yellowish brown silty clay loam with root intrusions. No burned materials were evident, and the sediment was likely deposited by natural alluvial processes. Artifacts recovered from Feature 10697 included four pieces of flaked stone debitage and two mano fragments, all from Level 1 of TP 12431.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 10697 was located at the surface of Unit IIA, with latest Holocene or Historical period alluvial-fan deposits (Unit V) overlying it. The unconformity between the Unit IIA surface and Unit V provides a geochronologic date of ca. 2420 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), placing this feature in the Middle Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
Feature 10697 was likely abandoned and covered with natural alluvial and aeolian sediments.

Stratigraphic Relationships and Surrounding Features
Three nonthermal pits (Features 10698, 10742, and 10743) and an FAR concentration (Feature 10703) surrounded Feature 10697 and are considered to be contemporaneous (see Appendix A).

Associated Features
No features were in direct contact with the activity area.

Late Archaic to Pioneer Period Component

Feature 13070
Feature type: activity area
Age: Late Archaic to Pioneer period
Locus: Area A
Grid location: J3
Level of effort: partial
Plan-view shape: indeterminate
Cross-sectional shape: irregular
Length (m): 4.00
Width (m): 2.00
Excavated depth (m): 0.21
Volume (m^3): 1.063
Surface area (m^2): 7.78

Excavation Methods
Feature 13070 was originally identified during mechanical excavation of MSU 10893 as a large, irregularly shaped, organic stain containing charcoal, ash, and FAR (see Appendix A). It was initially interpreted as a possible structure, and a 1-by-1-m control unit (TP 14409) was placed near the center. TP 14409 was excavated in one arbitrary 10-cm level and a second level that ended upon uncovering a compact use surface. Once the surface was identified in TP 14409, HSU 16564 was placed around TP 14409 to uncover more of the use surface (Figure 130). HSU 16564 was excavated to the use surface in two levels, similar to TP 14409. Only a portion of the activity area was exposed in HSU 16564, and the remainder of the activity area was left unexcavated. Three features were identified as originating at the activity-area surface (Table 53; see Figure 84). Feature 16603 was identified in TP 14409, and Features 16575 and 16576 were identified in HSU 16564. All three features were excavated in a controlled manner. No pit or postholes associated with the architecture of a structure were ever identified in association with Feature 13070, and therefore, the feature was recategorized as an activity area.

Feature Fill
The sediments associated with Feature 13070 consisted of a slightly soft, yellowish brown sandy clay loam with occasional patches of ash and sparse charcoal flecks. Artifacts recovered from Feature 13070 included

Figure 130. Photograph of the activity area and contemporaneous pits associated with Feature 13070 at Falcon Landing showing contemporaneous features within the HSU, view to the north.

Table 53. Features Associated with Feature 13070 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Nonthermal pit						
16575	circular	basin	0.68	0.65	0.13	contemporaneous
16576	circular	basin	0.46	0.42	0.09	contemporaneous
16603	circular	basin	0.84	0.82	0.17	contemporaneous

133 pieces of FAR, 19 pieces of flaked stone debitage, and 10 pieces of faunal bone. None of the artifacts were found in direct contact with the use surface.

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 13070 was located at the surface of Unit IIs/sf, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the surface of Unit IIs/sf and Unit IV provides a geochronologic date of ca. 790 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), placing the feature in the Late Archaic to Pioneer period.

Radiocarbon Analysis
None.

Abandonment Processes
The copious amounts of artifacts and FAR in the fill above Feature 13070 suggest that the area was abandoned and filled with refuse from other activities on the site. Following the deposition of refuse, the activity area was likely covered with natural alluvial and aeolian deposits.

Stratigraphic Relationships and Surrounding Features
Feature 13070 originated at the surface of Unit IIs/sf, suggesting that it is Late Archaic to Pioneer period in age. Two postholes associated with an adjacent structure (Feature 13071) were located immediately west of HSU 16564 (see Appendix A). Feature 13071 was radiocarbon dated to ca. 970–830 cal. B.C. The activity area is interpreted as contemporaneous with the occupation of Feature 13071, indicating that the activity area was used during the Late Archaic period.

Associated Features
Three features (Features 16575, 16576, and 16603) all originated at the surface of Feature 13070 and are considered contemporaneous (see Figure 84; Table 53). No features intruded upon the activity area. Feature 16575 was a circular, basin-shaped nonthermal pit with sparse amounts of charcoal and ash in the fill, as well as two pieces of FAR. Artifacts recovered from Feature 16575 included two pieces of faunal bone and one piece of flaked stone debitage. Feature 16576 was a circular, basin-shaped nonthermal pit with sparse charcoal and ash, as well as two pieces of FAR. Artifacts recovered from Feature 16576 included one piece of flaked stone debitage. Feature 16603 was a circular, basin-shaped nonthermal pit with moderate amounts of charcoal and ash, as well as five pieces of FAR. A single piece of faunal bone was recovered from the fill.

Late Archaic to Protohistoric Period Component

Feature 3954

Feature type: activity area
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: D2
Level of effort: complete
Plan-view shape: indeterminate
Cross-sectional shape: irregular
Length (m): 3.25
Width (m): 3.20
Excavated depth (m): 0.18
Volume (m^3): 1.321
Surface area (m^2): 7.42

Excavation Methods
Feature 3954 was identified as a large, circular, organic stain during mechanical excavations of MSU 3873, located in the southwestern portion of Falcon Landing (see Appendix A). Based on the size and shape of the stain, the feature was preliminarily interpreted as a structure. A 1-by-2-m control unit (TP 7476) was excavated near the center of the feature (Figure 131). Level 1 of TP 7476 was excavated in one stratigraphic level approximately 13 cm in depth, to a compact earthen use surface. Once the surface associated with Feature 3954 was identified in TP 7476, the remainder of the feature was excavated in two sections (see Figure 131). SEC 8514 included the portion of Feature 3954 south of TP 7476, and SEC 8550 included the area of Feature 3954 north of TP 7476. Both sections were excavated in one stratigraphic level, to the surface identified in TP 7476. Once the surface was completely exposed, two pits (Features 8617 and 8619) were identified as originating at the activity-area surface (Table 54; see Figure 131), and another pit (Feature 8646) was found to intrude upon the southwestern edge of Feature 3954 (Figure 132; see Figure 131). A pollen sample was collected from the use surface associated with Feature 3954 and submitted for further analysis (see Chapter 7, Volume 2). Owing to the lack of architectural components, this feature is being considered an activity area rather than a structure.

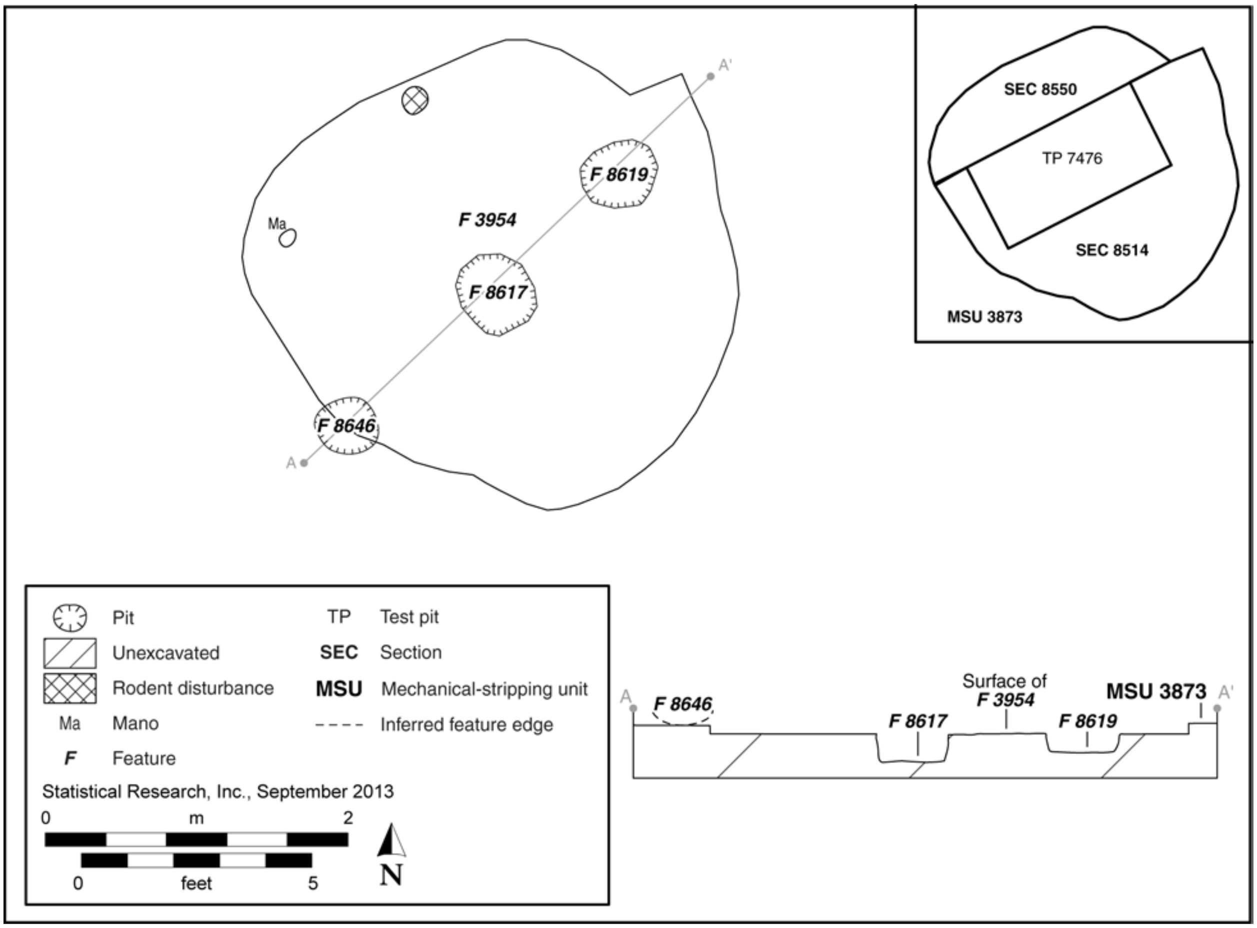

Figure 131. Post-excavation plan view and cross section of Feature 3954 (an activity area), Features 8617 and 8619 (contemporaneous pits), and Feature 8646 (an intrusive pit) at Falcon Landing.

Table 54. Features Associated with Feature 3954 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Nonthermal pit						
8617	circular	cylindrical	0.58	0.55	0.20	contemporaneous
8619	circular	basin	0.45	0.44	0.10	contemporaneous
Thermal pit						
8646	circular	basin	0.54	0.54	0.05	intrusive

Figure 132. Post-excavation photograph of Feature 3954 at Falcon Landing and the contemporaneous pits associated with it, view to the south.

Feature Fill

A single stratum rested on the surface of Feature 3954, consisting of a moderately compact, brown silt loam with a moderate amount of charcoal, oxidized sediment, and FAR. The surface of the activity area consisted of compacted natural sediments with moderate root and rodent disturbance. Artifacts from Feature 3954 included three pieces of flaked stone debitage and one piece of faunal bone. Additionally, a complete mano (PD 7483) was point-located on the use surface (see Figure 131).

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

<u>**Diagnostic Material Culture**</u>

None.

<u>**Geochronologic Analysis**</u>

Feature 3954 was located at the surface of Unit III1, with latest Holocene alluvial-fan deposits (Unit V) overlying it. The unconformity between the surface of Unit III1 and Unit V provides a geochronologic date of ca. 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), placing this feature in the Late Archaic to Protohistoric period.

<u>**Radiocarbon Analysis**</u>

None.

Abandonment Processes

Feature 3954 was likely abandoned and covered with natural alluvial sediments. The low number of artifacts suggests that the activity area was abandoned and that only minimal amounts of refuse were deposited into the feature. Following the natural deposition of sediments in Feature 3954, a thermal pit (Feature 8646) was excavated into the fill associated with the activity area (see Figure 131).

Stratigraphic Relationships and Surrounding Features

Feature 3954 was present at the surface of Unit III1, suggesting that it was occupied sometime after the Late Archaic period. Several features surrounded Feature 3954 (see Appendix A). A Red Mountain phase structure (Feature 3963) was located about 2 m to the west. Nearby features contemporaneous with Feature 3954 included a nonthermal pit (Feature 3965) and one charcoal/ash lens (Feature 3964). Nearby features dated to the Middle to Late Archaic period included six nonthermal pits (Features 3953, 3955, 3956, 3957, 3966, and 3967) and a thermal pit (Feature 3962).

Associated Features

Two pits (Features 8617 and 8619) originated at the surface associated with Feature 3954 and are considered contemporaneous (see Figure 131; Table 54). Feature 8617 was a circular, cylindrical nonthermal pit with abundant charcoal in the fill. No artifacts were recovered from the pit. Feature 8619 was a circular, basin-shaped nonthermal pit with no artifacts or burned material in the fill.

Feature 8646 was intrusive into the southeastern edge of Feature 3954 (see Figure 131). It was a circular, basin-shaped thermal pit containing charcoal, ash, oxidized sediment, and three pieces of faunal bone (see Table 54).

Cienega Phase Component

Feature 1239

Feature type: activity area
Age: Cienega phase
Locus: Area B
Grid location: B4
Level of effort: partial
Plan-view shape: indeterminate
Cross-sectional shape: irregular
Length (m): 3.50
Width (m): 3.50
Excavated depth (m): 0.24
Volume (m^3): 2.923
Surface area (m^2): 12.14

Excavation Methods

Feature 1239 was originally identified during Phase 1 in both walls of TR 1230, located in the southeastern portion of Falcon Landing (see Appendix A). The feature was initially interpreted as a structure, based on the profile of TR 1230. Feature 1239 was further defined in plan view during Phase 1 mechanical stripping of MSU 1281 (Figure 133). A 1-by-1-m control unit (TP 5692) was placed near the center of Feature 1239, south of TR 1230 (Figure 134). TP 5692 was excavated in two levels. Level 1 was arbitrarily 10 cm in depth, but Level 2 ended upon reaching a compacted use surface preliminary identified as an unprepared floor. The portion of Feature 1239 that remained south of the trench was excavated to the use surface in one level as SEC 5722 (see Figure 134). A nonthermal pit (Feature 5860) was identified in SEC 5722 as originating at the use surface (Table 55). Additionally, a cluster of rock was identified on the surface in SEC 5722. The portion of Feature 1239 located north of TR 1230 was excavated in one level as SEC 5844 (see Figure 134). A nonthermal pit (Feature 5863) was identified in SEC 5844 as originating at the use surface (see Table 55). Both of the pit features that originated at the use surface were partially excavated following the excavation of Feature 1239. Owing to the lack of architectural components, this feature is being considered an activity area rather than a structure.

Figure 133. Photograph of the activity area and contemporaneous pits associated with Feature 1239 at Falcon Landing, view to the southwest.

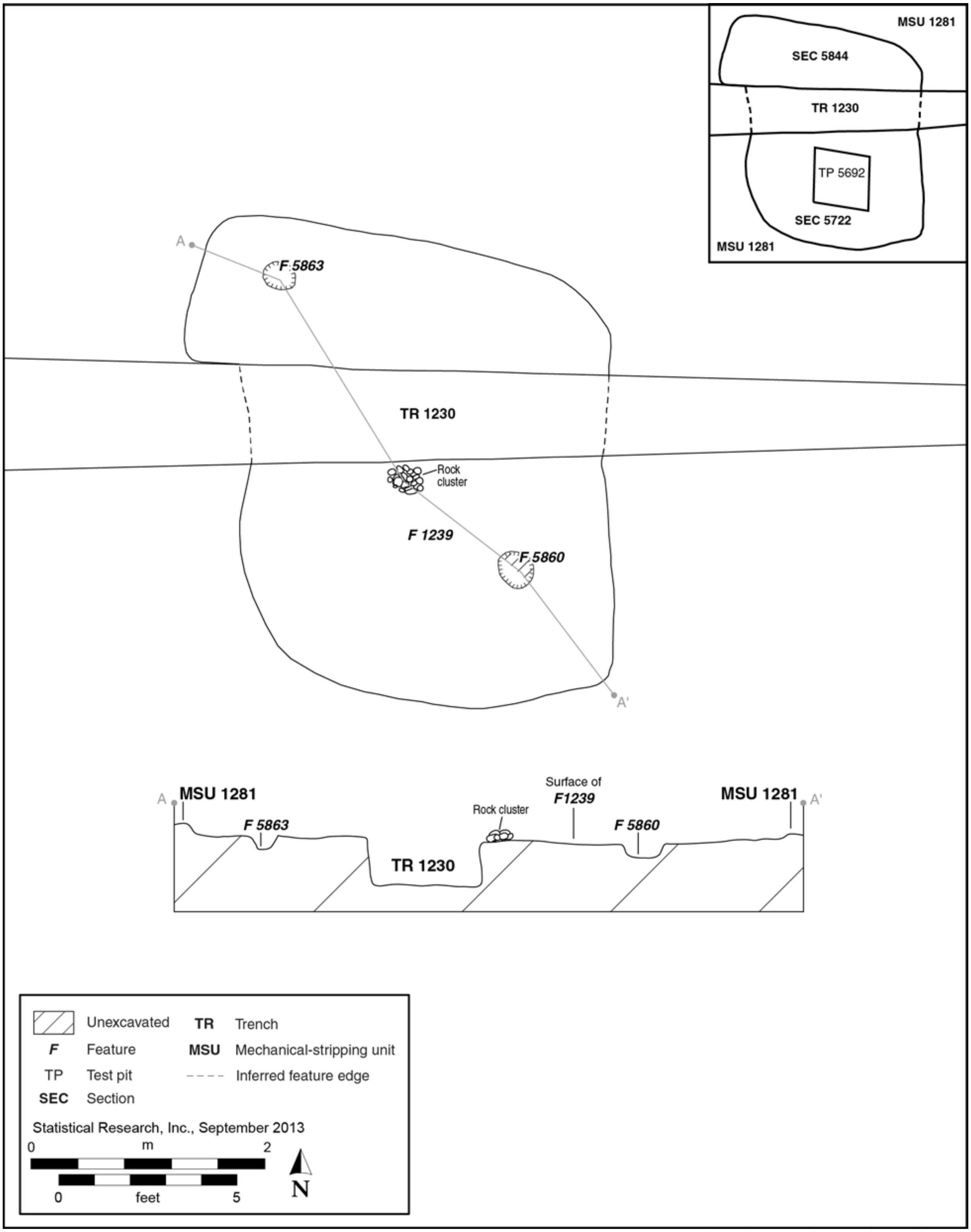

Figure 134. Post-excavation plan view and cross section of Feature 1239 (an activity area) and Features 5860 and 5863 (contemporaneous pits) at Falcon Landing.

Table 55. Features Associated with Feature 1239 at Falcon Landing

Feature No., by Feature Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Relationship
Nonthermal pit						
5860	ovate	irregular	0.35	0.25	0.09	contemporaneous
5863	circular	basin	0.37	0.28	0.14	contemporaneous

Feature Fill

The sediments associated with Feature 1239 consisted of a moderately hard silt loam containing sparse, dispersed charcoal and ash. The sediments were riddled with numerous insect burrows. The identified use surface was characterized as a moderately hard silt loam with calcium-carbonate masses, a blocky texture, and fine gravel. Artifacts recovered from Feature 1239 included 126 pieces of flaked stone debitage, 18 pieces of faunal bone, 2 flaked stone cores, 2 pieces of FAR, a utilized flake, and a mano fragment.

Evidence of Remodeling

No evidence of remodeling was evident.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 1239 was located within Unit III2. The bracketing age range for Unit III2 is ca. 720–200 cal. B.C. (see Chapter 2, Volume 2), placing it in the Cienega phase of the Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

Feature 1239 was likely abandoned and filled by natural alluvial sediments. The numerous artifacts in the fill of Feature 1239 suggest that intentionally deposited refuse was also introduced into the fill after it was abandoned, during the period when the feature was being covered by natural sediments.

Stratigraphic Relationships and Surrounding Features

Feature 1239 was located within Unit III2, indicating use during the Cienega phase of the Late Archaic period. Numerous features surrounded Feature 1239 (see Appendix A). An activity area (Feature 1303) was located about 1 m to the west and was radiocarbon dated to 2480–2340 cal. B.C. A structure (Feature 1290) was located about 6 m to the west and was radiocarbon dated to ca. A.D. 640–670. Feature 1303 was located at the surface of stratigraphic Unit I, with Unit III2 overlying the structure; therefore, it predated Feature 1239. Feature 1290 was located at the surface of stratigraphic Unit III2 and therefore postdated Feature 1239. One nearby nonthermal pit (Feature 1297) was potentially contemporaneous with Feature 1239 and was also assigned to the Cienega phase. Several other nearby features predated Feature 1239, were located at the stratigraphic boundary between Units I and III2, and dated to the Early to Late Archaic period. These features included five nonthermal pits (Features 1240, 1305, 1306, 1339, and 1472) and two thermal pits (Features 1299 and 1300).

Associated Features

Two nonthermal pits (Features 5860 and 5863) originated at the activity-area surface and are considered contemporaneous with Feature 1239 (see Figure 134; Table 55). Feature 5860 was an ovate, cylindrical nonthermal pit with no artifacts. Small amounts of charcoal and ash were present in the fill. Feature 5863 was a circular, basin-shaped nonthermal pit with no artifacts and no burned material. In addition, a cluster of rock was uncovered, found resting on the surface of Feature 1239. It consisted of 15 rocks, 3–11 cm each in diameter, in a 0.48-by-0.26-m area. The rock cluster was not given a feature number, and the rocks were not collected. No features intruded upon Feature 1239.

Late Cienega to Red Mountain Phase Component

Feature 14729

Feature type: activity area
Age: Late Cienega to Red Mountain phase
Locus: Area A
Grid location: H5
Level of effort: complete
Plan-view shape: indeterminate
Cross-sectional shape: basin
Length (m): 3.10
Width (m): 1.30
Excavated depth (m): 0.27
Volume (m^3): 0.408
Surface area (m^2): 4.06

Excavation Methods
Feature 14729 was originally identified during the excavation of HSU 17912, located in the central portion of Area A (see Appendix A). The northern portion of Feature 14729 was removed by TR 2213; therefore, the plan-view shape of the activity area could not be determined. Feature 14729 was excavated in one unit (SEC 18691) and one stratigraphic level, to the surface of the activity area (Figure 135).

Feature Fill
The sediments associated with Feature 14729 consisted of a slightly hard silty-clay loam with moderate amounts of charcoal, ash, and oxidized sediments as well as 27 pieces of FAR. Artifacts included 7 pieces of flaked stone debitage, 7 pieces of faunal bone, and 1 indeterminate ground stone fragment.

Evidence of Remodeling
No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 14729 was located within Unit III2cf. The bracketing age range for Unit III2cf is ca. 160 cal. B.C.–cal. A.D. 340 (see Chapter 2, Volume 2), placing the feature in the Late Cienega to Red Mountain phase.

Radiocarbon Analysis
None.

Abandonment Processes
The activity area was abandoned and filled with natural alluvial sediments.

Stratigraphic Relationships and Surrounding Features
Feature 14729 originated within Unit III2cf and was surrounded by several other features that were uncovered in HSU 17912, including five structures (Features 2529, 14702, 17904, 17908, and 18887) and several extramural pits (Features 14700, 17907, and 17910) (see Figure 91 and Appendix A). Features 17907 and 17910 overlapped Feature 14729 (see Figure 135), but the stratigraphic relationship of the three features could not be determined. Feature 2529 was radiocarbon dated to ca. 40 cal. B.C.–cal A.D. 90, and Feature 17908 was radiocarbon dated to ca. 150 cal. B.C.–cal. A.D. 390. Feature 14729 was likely roughly contemporaneous with these structures.

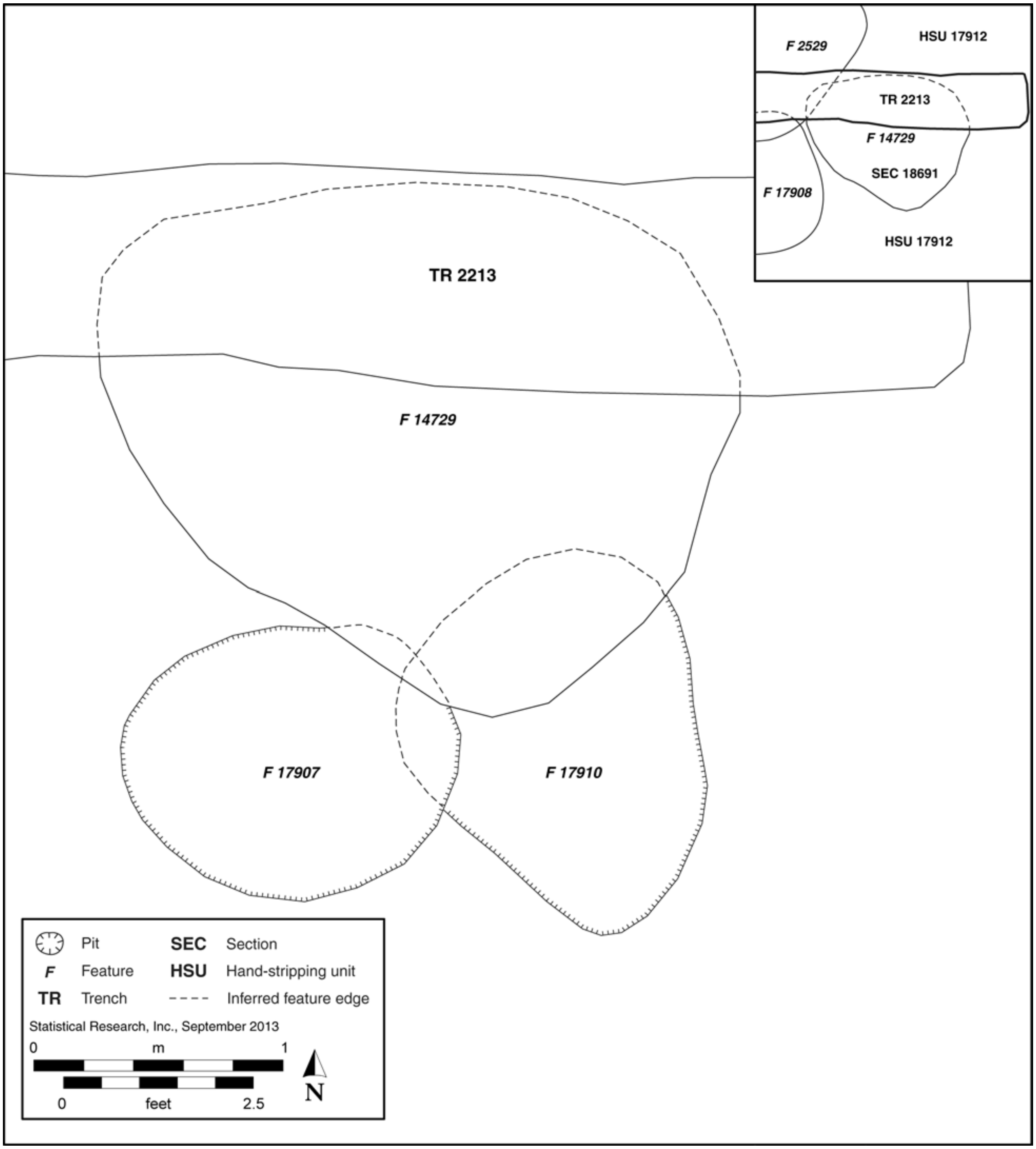

Figure 135. Post-excavation plan view of Feature 14729 (an activity area) and Features 17907 and 17910 (overlapping pits) at Falcon Landing.

Associated Features

No features originated at the surface of Feature 14729. Features 17907 and 17910 overlapped Feature 14729 (see Figure 135), but the stratigraphic relationship of these three features could not be determined.

Post–Middle Archaic Period Component

Feature 15119

Feature type: activity area
Age: post–Middle Archaic period
Locus: Area B
Grid location: F2
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: irregular
Length (m): 4.44
Width (m): 3.45
Excavated depth (m): 0.27
Volume (m^3): 2.930
Surface area (m^2): 11.74

Excavation Methods

Feature 15119 was identified during the mechanical excavation of MSU 15068 as a large, ovate, organic stain containing charcoal, FAR, and ground stone and flaked stone artifacts (see Appendix A). It was initially interpreted as a possible structure, and a 1-by-2-m control unit (TP 16288) was placed near the center (Figure 136). TP 16288 was excavated in two arbitrary 10-cm levels. A third level was excavated in the southern half of TP 16288. The bottom of Level 3 in TP 16288 encountered a compacted use surface.

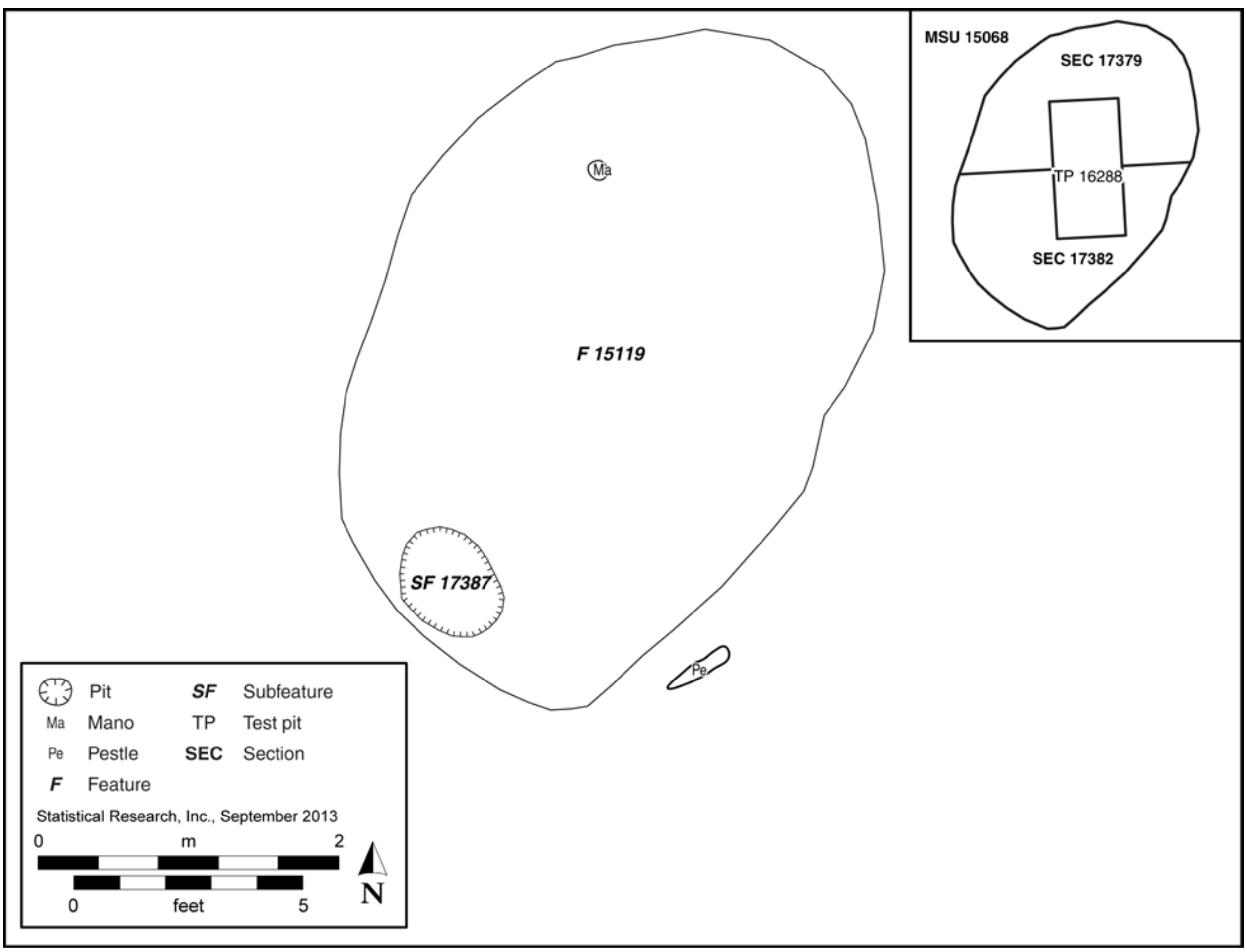

Figure 136. Post-excavation plan view of Feature 15119 (an activity area) and Subfeature 17387 (a contemporaneous pit) at Falcon Landing.

The feature was then divided into two sections; SEC 17379 corresponded to the northern half of the feature, and SEC 17382 corresponded to the southern half (see Figure 136). Both sections were excavated in one stratigraphic level, to the surface identified in TP 16288. A pollen sample was collected from the use surface and submitted for further analysis (see Chapter 7, Volume 2). A thermal pit (Subfeature 17387) and a mano were also identified on the use surface. The thermal pit was partially excavated, and the mano was point-located (Figure 137). Owing to the lack of architectural components, this feature is being considered an activity area rather than a structure.

Feature Fill

The fill of Feature 15119 consisted of a compact, grayish brown silt loam with sparse charcoal flecks that was likely associated with natural wind- and water-lain deposits. The surface associated with the activity area consisted of the compacted natural substrate. Artifacts recovered from the activity area included 11 pieces of FAR, 5 pieces of flaked stone debitage, 3 pieces of faunal bone, and 1 metate fragment. A complete mano (PD 17362) was found resting on the activity-area use surface, and a complete pestle (PD 17363) was found adjacent to the activity area, at the originating deposits (Table 56; see Figure 137).

Evidence of Remodeling

No evidence of remodeling was observed.

Chronometric Data

Diagnostic Material Culture

None.

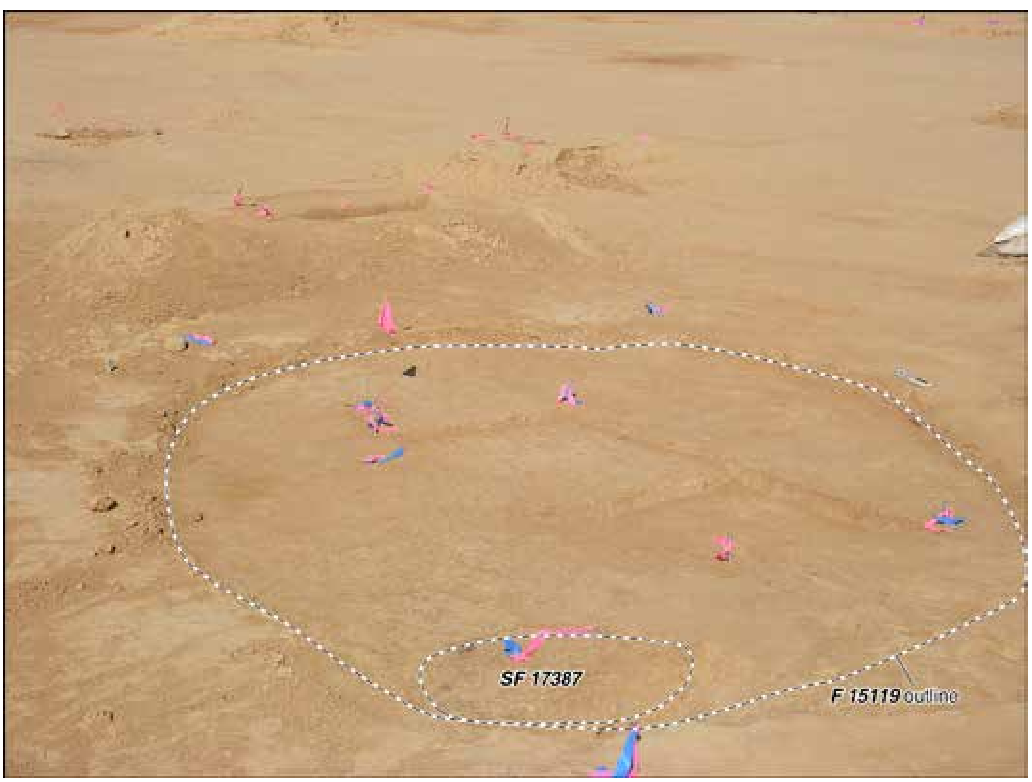

Figure 137. Post-excavation photograph of Feature 15119 (an activity area) and Subfeature 17387 (a contemporaneous pit) at Falcon Landing, view to the northeast.

Table 56. Point-Located Artifacts in Feature 15119 at Falcon Landing

PD No.	Stratum	Artifact Class	Artifact Type	Object
17362	archaeological surface	lithic	mano	cobble mano
17363	archaeological surface	lithic	pestle	shaped pestle

Geochronologic Analysis

Feature 15119 was located at the surface of Unit II; however, the overlying stratum could not be determined. The age for a feature at the surface of Unit II for which the overlying stratum is unknown is post-2730 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

None.

Abandonment Processes

A mano was left on the surface of the activity area, and a pestle was left on the originating surface of the activity area, suggesting that Feature 15119 was intended to be reused or had an unplanned abandonment. The fill associated with Feature 15119 suggests that the activity area was abandoned and filled with natural alluvial and aeolian sediments. The small number of artifacts in the fill suggests either that the refuse deposits were intentional or that the artifacts were transported into the feature fill through natural processes.

Stratigraphic Relationships and Surrounding Features

Feature 15119 originated at the surface of Unit II, suggesting that it may be associated with Archaic period occupation of the site. A few extramural pits were located in proximity to Feature 15119, including three thermal pits (Features 15117, 15120, and 15136) and three nonthermal pits (Features 15118, 15134, and 15135) (see Appendix A). All nearby features were located at the surface of Unit II and therefore dated to sometime after ca. 2730 B.C. (post–Middle Archaic period).

Associated Features

A single thermal pit (Subfeature 17387) originated at the surface of the activity area (see Figure 137). Subfeature 17387 was a circular, basin-shaped thermal pit with a moderate amount of charcoal in the fill. No artifacts were present in the feature. The walls and base of the pit were slightly oxidized and blackened. No features intruded upon Feature 15119.

Caches

Caches on the Luke Solar project are characterized as concentrations of complete, serviceable stone tools. The information from caches and other de facto refuse can play an important role in the interpretation of site function and abandonment processes (Binford 1979; Diehl 1998; Schiffer 1996:89–98; Schlanger 1991). As Schiffer (1996:93) pointed out, mobile groups often cached large items, such as ground stone, in areas of anticipated return. These items are considered abandonment caches or "site furniture" (see Binford 1979:264). For example, caches of ground stone would allow mobile groups to reoccupy desirable plant-processing locations on a seasonal or sporadic basis and to reuse tools, without the investment of obtaining or manufacturing new ground stone tools.

In total, 19 caches were identified at Falcon Landing (Table 57). In most instances, the caches were located within shallow pits; however, some of the caches did not have discernible pits and may have been present on the aboriginal surface. Alternatively, an aboriginal pit that was excavated and immediately filled would be difficult to identify hundreds or thousands of years later, particularly if the pit lacked any burned materials or stratified sediments. Usually, the caches contained exclusively ground stone tools; however,

Table 57. Caches at Falcon Landing, by Chronologic Group

Feature No.	Level of Effort	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
Early to Late Archaic Period											
3598	partial	0.30	0.22	0.10	0.018	—	1	—	—	1	71.429
3611	partial	0.35	0.30	0.08	0.007	1	1	1	—	3	750.000
5945	complete	1.03	0.91	0.25	0.035	9	3	5	—	17	485.714
Middle to Late Archaic Period											
3902	complete	0.70	0.70	0.25	0.058	—	2	3	—	5	86.207
3993	complete	0.35	0.20	0.09	0.004	1	2	6	1	10	2,500.000
5185	sampled	0.74	—	0.26	0.031	—	3	—	—	3	187.500
Middle Archaic to Pioneer Period											
3190	complete	0.60	0.50	0.22	0.051	—	1	1	—	2	39.216
Middle Archaic to Protohistoric Period											
3894	complete	0.72	0.63	0.20	0.064	—	3	—	—	3	46.875
Late Archaic to Pioneer Period											
10934	complete	0.37	0.31	0.17	0.048	—	3	2	—	5	104.167
15139	sampled	0.40	0.30	0.22	0.018	—	3	—	—	3	166.667
Late Archaic to Protohistoric Period											
3074	complete	1.17	1.03	0.20	0.190	2	4	—	—	6	31.579
3792	complete	0.61	0.29	0.16	0.072	—	3	—	—	3	41.667
3802	complete	0.76	0.74	0.23	0.117	—	2	—	—	2	17.094
3817	complete	0.24	0.20	0.12	0.034	3	—	—	—	3	88.235
Cienega Phase											
3775	complete	0.34	0.16	0.08	0.029	—	2	—	—	2	68.966
Pioneer to Classic Period											
4664	complete	0.86	0.83	0.11	0.051	—	2	—	—	2	39.216
10931	complete	0.42	0.24	0.25	0.028	—	2	—	—	2	71.429
Snaketown Phase											
3372	partial	0.81	indeterminate	0.38	0.084	1	2	—	—	3	71.429
Post–Late Archaic Period											
3733	complete	0.38	0.36	0.21	0.025	—	2	—	—	2	80.000

[a] Artifact-density calculations are based on level of effort; therefore, partially excavated features have artifact densities based on the percentages of the features excavated.

some caches also contained flaked stone tools or a combination of flaked stone and ground stone tools. Some of the caches also contained several pieces of faunal bone and flaked stone debitage. The faunal bone and debitage are likely incidental artifacts not necessarily associated with the caching behavior.

Apart from the 19 discrete cache features at Falcon Landing, hundreds of whole, serviceable ground stone tools were identified during mechanical stripping. These ground stone tools were found buried in the extramural space between and among features throughout Falcon Landing. Although some of these ground stone tools were likely discarded on the aboriginal site surface, many of them are believed to have been strategically cached or left in place for future processing activities. Evidence for caching behavior included multiple complete ground stone items clustered together. Over 500 ground stone tools were recovered from extramural space at Falcon Landing. Of these approximately 500 tools, over 400 were complete, and many exhibited significant shaping, pecking, or polishing. The items were predominantly manos and metates but also included mortars, pestles, and netherstones (for a more in-depth discussion of extramural ground stone artifacts at Falcon Landing, please see Chapter 3, Volume 2). The following are descriptions of three representative caches excavated at Falcon Landing.

Early to Late Archaic Period Component

Feature 5945

Feature type: cache
Age: Early to Late Archaic period
Locus: Area B
Grid location: B4
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 1.03
Width (m): 0.91
Excavated depth (m): 0.25
Volume (m³): 0.035

Excavation Methods

Feature 5945 was a ground stone cache originally identified during mechanical excavations of MSU 3522 (see Appendix A). The southern half of Feature 5945 was excavated as SEC 6236 in one stratigraphic level, to the base of the pit, and exposed a large closed-basin metate. The northern half of the feature was excavated as SEC 6245 in one stratigraphic level, to the base of the pit (Figure 138). Two complete manos were also identified during the excavation of SEC 6245. The metate and two manos were point-located and collected individually (Figure 139).

Feature Fill

The fill of Feature 5945 consisted of a slightly hard brown silt loam with a few small, subangular gravels. Occasional charcoal flecks were also present in the fill. The fill of Feature 5945 was differentiated from the natural sediments by a slightly softer texture and the presence of charcoal. Besides the metate and the 2 manos, 9 pieces of flaked stone debitage and 5 pieces of faunal bone were recovered.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 5945 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the surface of Unit I and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2), placing the feature in the Early to Late Archaic period.

Radiocarbon Analysis

None.

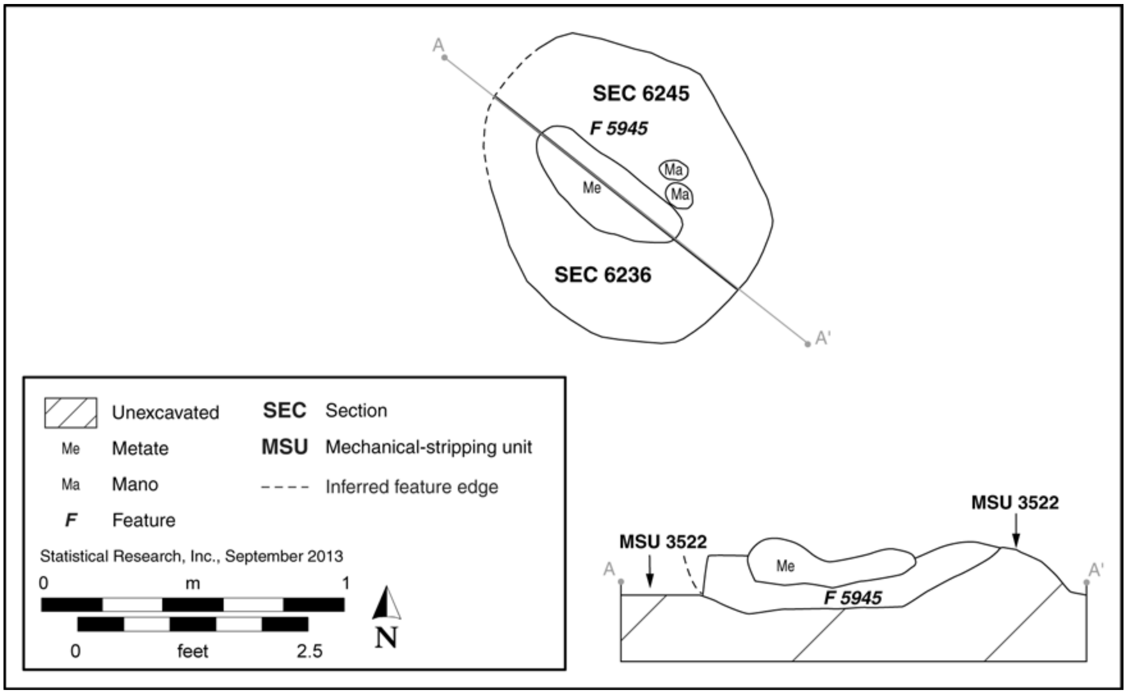

Figure 138. Mid-excavation plan view and cross section of Feature 5945 (a ground stone cache) at Falcon Landing.

Figure 139. Photograph of Feature 5945 (a ground stone cache) at Falcon Landing, view to the south.

Abandonment Processes

The presence of flaked stone debitage, faunal bone, and sparse charcoal within the fill of Feature 5945 suggests that the pit was not immediately filled after the placement of the ground stone tools. It is possible that the metate and the manos associated with Feature 5945 were deposited in the pit, left exposed to the elements, and later became buried by natural alluvial deposits. Alternatively, the pit may have already contained charcoal and other artifacts prior to its use as a ground stone cache.

Stratigraphic Relationships and Associated Features

Several pits were spatially associated with Feature 5945 (see Appendix A), including six nonthermal pits (Features 3549, 3550, 3552, 3575, 3577, and 3579), a nonthermal bell-shaped pit (Feature 3551), and an FAR concentration (Feature 3547). All of these features were in the same stratigraphic position as Feature 5945 and dated to the Early to Late Archaic period.

Late Archaic to Protohistoric Period Component

Feature 3792

Feature type: cache
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: C3
Level of effort: complete
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 0.61
Width (m): 0.29
Excavated depth (m): 0.16
Volume (m^3): 0.072

Excavation Methods

Feature 3792 was a ground stone cache originally identified during mechanical excavation of MSU 3542 (see Appendix A). Feature 3792 contained two large metates: a basin metate and a grinding slab. The sediment surrounding the metates was manually removed in one arbitrary unit (SEC 3792) and level in order to expose the artifacts. A complete mano was also identified during excavation (Figure 140). All three ground stone items were point-located and collected separately (Figure 141). Two pollen samples were collected from Feature 3792, one from beneath the lower metate and one from beneath the mano. Both samples were submitted for further analyses (see Chapter 7, Volume 2).

Feature Fill

The fill associated with Feature 3792 consisted of a slightly blocky brown silt loam similar to the natural sediments. The Feature 3792 pit was difficult to discern, and the ground stone may have been resting on the aboriginal ground surface. No charcoal, ash, oxidized sediments, or other artifacts were present in the surrounding sediments.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 3792 was located at the surface of Unit IIs/sf/Unit III1, with latest Holocene or Historical period alluvial-fan deposits (Unit V) overlying it. The unconformity between the surface of Unit IIs/sf/Unit III1 and Unit V provides a geochronologic date of ca. 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Protohistoric period.

Radiocarbon Analysis

None.

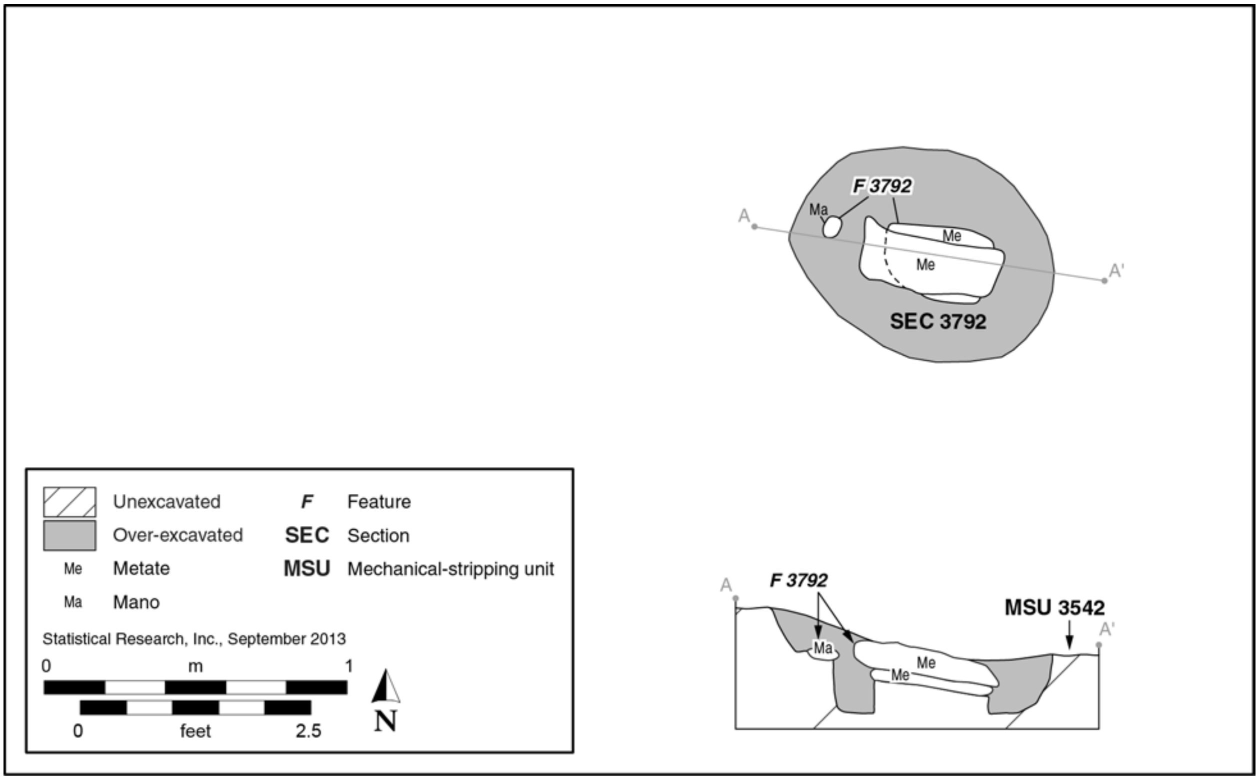

Figure 140. Post-excavation plan view and cross section of Feature 3792 (a cache containing stacked metates and a mano) at Falcon Landing.

Figure 141. Photograph of Feature 3792 (a cache containing stacked metates and a mano) at Falcon Landing, view to the south.

Abandonment Processes

The lack of stratified sediments and burned material in the fill of Feature 3792 indicates that the pit was not open for a long period of time. The ground stone implements were likely placed in the pit, which was immediately backfilled. Alternatively, the ground stone tools may have been placed on the aboriginal ground surface and become subsequently covered by natural alluvial sediments.

Stratigraphic Relationships and Associated Features

Only a few features were adjacent to Feature 3792, including two nonthermal pits (Features 3812 and 3821), a thermal pit (Feature 3793), and a thermal bell-shaped pit (Feature 3813) (see Appendix A). These features are all post–Late Archaic period in age.

Snaketown Phase Component

Feature 3372

Feature type: cache
Age: Snaketown phase
Locus: Area B
Grid location: D6
Level of effort: partial
Plan-view shape: indeterminate
Cross-sectional shape: basin
Length (m): 0.81
Width (m): indeterminate
Excavated depth (m): 0.38
Volume (m³): 0.084

Excavation Methods

Feature 3372 was a cache of two pestles located in the northeastern portion of Area B (see Appendix A). Feature 3372 was originally identified in the sidewall of MSU 3209. The southern portion of Feature 3372 was excavated as SEC 8856 in one stratigraphic level, to the base of the pit (Figure 142). The northern portion of the pit remained unexcavated beyond the edge of MSU 3209.

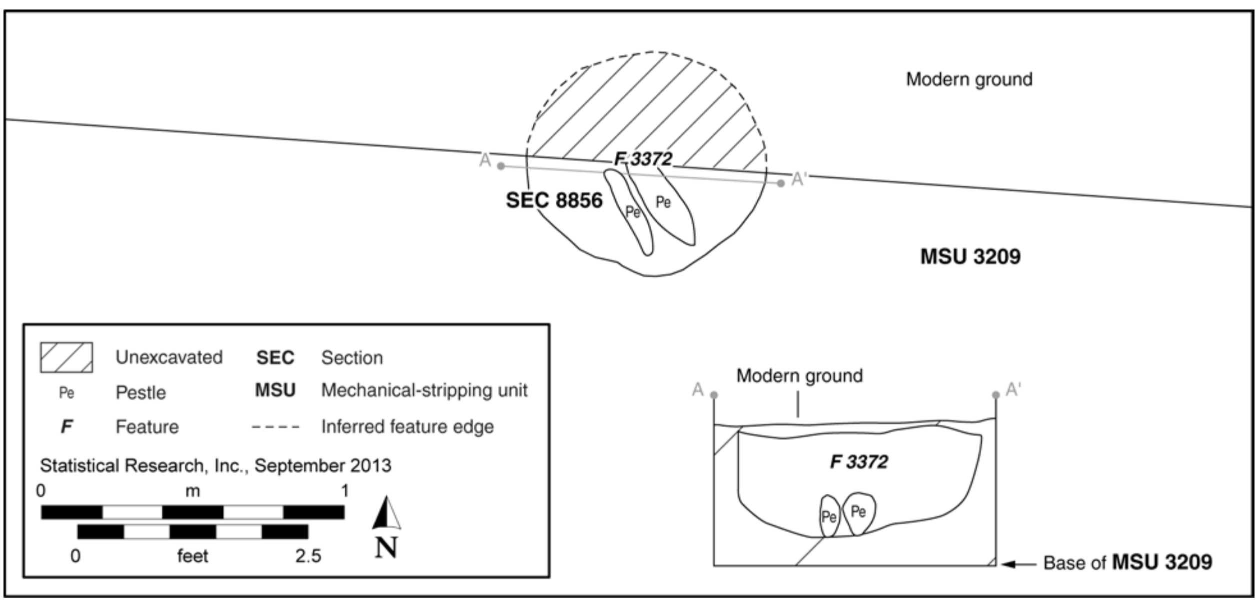

Figure 142. Mid-excavation plan view and cross section of Feature 3372 (a cache containing two pestles) at Falcon Landing.

Feature Fill

The fill of Feature 3372 consisted of a homogeneous, slightly hard silt loam with some sand and calcium-carbonate inclusions. A small amount of ash was also observed in the fill. The fill had been considerably disturbed by insect activity. Two complete pestles (PDs 8858 and 8859) (Figure 143) were point-located and collected, and one piece of flaked stone debitage was also recovered from the pit.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 3372 originated at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the surface of Unit IIA and Unit IV provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A charred piece of mesquite (*Prosopis* sp.) wood was recovered from the fill of Feature 3372 and submitted to Aeon for AMS dating. The charcoal returned a 2σ date of cal. A.D. 650–770 (Aeon Sample No. 1513), indicating that this particular cache was buried during the Snaketown phase of the Pioneer period.

Abandonment Processes

Feature 3372 was excavated, two complete pestles were placed in the pit, and the pit was then filled with natural sediments. A small amount of ash and a single piece of flaked stone debitage in the fill suggest that the pit may have been left open for a short period of time or that it was used to deposit trash.

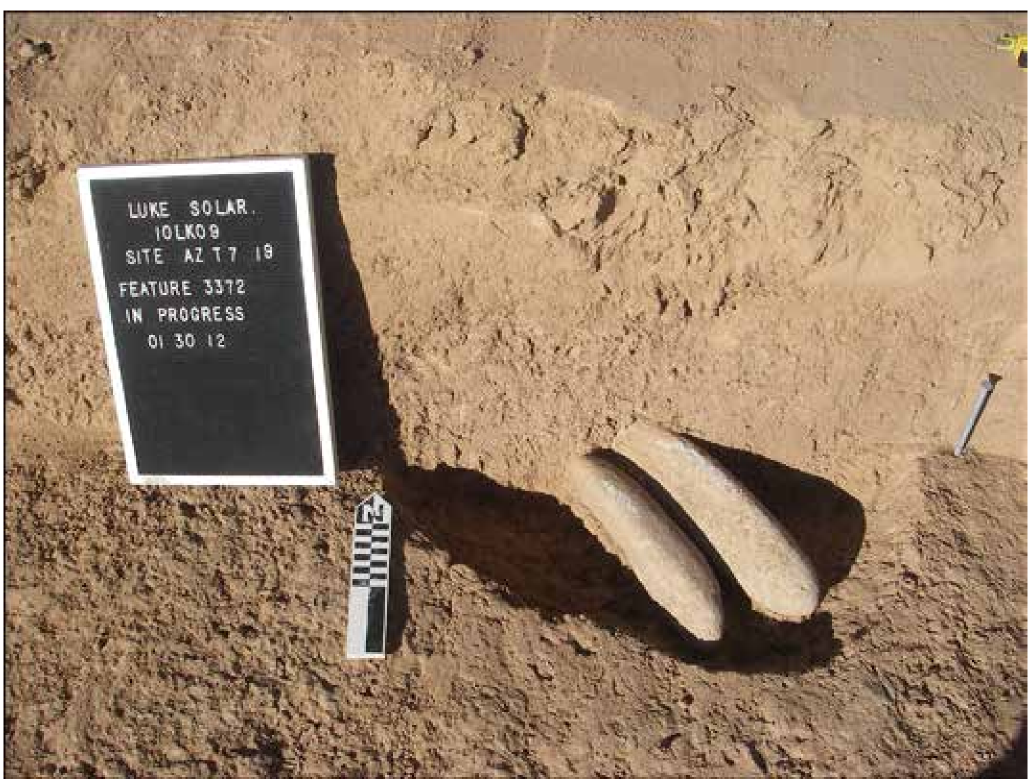

Figure 143. Photograph of Feature 3372 (a cache containing two pestles) at Falcon Landing, view to the north.

Stratigraphic Relationships and Associated Features

Feature 3372 was located within a cluster of features in the northeastern corner of Area B (see Appendix A). Immediately surrounding Feature 3372 were nine nonthermal pits (Features 3302, 3303, 3308, 3309, 11088, 11089, 11093, 11094, and 14929) and one thermal pit (Feature 3306). Additionally, two structures (Features 3321 and 3322) were located approximately 13 m to the east, and another structure (Feature 11105) was located approximately 20 m to the northwest. Features 3302, 3303, and 14929 dated to the Chiricahua phase; Features 3308, 3309, 11089, 11093, and 11105 dated to the Middle Archaic to Pioneer period; Feature 11088 dated to the Early Cienega phase; Feature 3321 dated to the Snaketown phase; and Features 3306, 3322, and 11094 dated to the Pioneer to Classic period.

Charcoal/Ash Lenses

According to the HPTP (Hall et al. 2011:52), charcoal lenses are defined as large, thin (<1–5-cm-thick), enigmatic lenses of charcoal that extend for several meters in the profiles of trenches. The sizes and character of these features, as originally identified in backhoe trenches, were suggestive of large burned areas, possibly agricultural fields. Subsequent investigation, including mechanical excavations and geoarchaeological analysis, led to the interpretation of these large charcoal lenses as natural phenomena. For example, during Phase 1, Feature 2486 was identified in TR 2213 approximately 64 cm below the modern ground surface. It extended about 9 m east–west in the profile of TR 2213. A charred piece of mesquite (*Prosopis* sp.) wood was collected from the feature during Phase 1 and submitted for AMS dating, and it returned a 2σ date of ca. 2833–2491 cal. B.C. (Aeon Sample No. 736), corresponding to the Chiricahua phase of the Middle Archaic period. Subsequent Phase 2 mechanical excavations over Feature 2486 demonstrated that this charcoal lens was actually a natural alluvial deposit containing occasional pieces of charcoal. Feature 2486 was therefore considered a noncultural feature.

During Phase 2 mechanical stripping and manual feature excavation, numerous features were identified and excavated that contained thin lenses of ash or combinations of ash and charcoal; therefore, this particular feature type was updated to "charcoal/ash lens." In total, 65 charcoal/ash lenses were identified at Falcon Landing (Table 58). There were wide varieties in size and shape, ranging from 0.23 m to over 10 m in diameter. In general, these charcoal/ash lenses were thin and flat in cross section and ranged from 0.01 to 0.49 m in depth. The following are descriptions of two representative charcoal/ash lenses at Falcon Landing.

Early to Late Archaic Period Component

Feature 3073

Feature type: charcoal/ash lens
Age: Early to Late Archaic period
Locus: Area B
Grid location: B3
Level of effort: complete
Plan-view shape: irregular
Cross-sectional shape: flat
Length (m): 3.00
Width (m): 2.20
Excavated depth (m): 0.05
Volume (m^3): 0.250

Excavation Methods

Feature 3073 was a charcoal/ash lens located in the southwestern portion of Area B (see Appendix A). Feature 3073 was originally identified during mechanical excavation of MSU 3850 as an irregularly shaped ashy stain. Initially, a 1-by-1-m control unit (TP 8302) was placed near the center of the feature (Figure 144). TP 8302 was excavated in a single arbitrary 10-cm level, and the base of Level 1 was excavated into naturally occurring sediments. Subsequent inspection of the TP 8302 profile revealed that the cultural sediments associated with Feature 3073 were approximately 5 cm thick in that part of the feature. The rest of Feature 3073 was excavated in two sections; SEC 8336 was in the northern half, and SEC 8332 was in the southern half (see Figure 144). Both sections were excavated in one stratigraphic level, to the base of the ashy deposit.

Table 58. Charcoal Lenses at Falcon Landing, by Chronologic Group

Feature No.	Level of Effort	Density of Burned Materials in Fill	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
Early to Middle Archaic Period												
3058	partial	indeterminate	0.38	0.52	0.14	0.022	—	—	—	—	—	—
4000	partial	sparse	0.42	0.40	0.02	0.003	—	—	—	—	—	—
7003	partial	sparse	0.30	0.28	0.02	0.004	—	—	—	—	—	—
Early to Late Archaic Period												
1308	partial	sparse	0.71	0.59	0.04	0.012	—	—	—	—	—	—
1380	complete	moderate	0.72	0.52	0.14	0.036	—	—	—	—	—	—
1407	partial	nonexistent	0.90	0.82	0.13	0.081	—	—	—	—	—	—
1476	partial	moderate	1.68	1.47	0.01	0.018	16	—	—	—	16	1,777.778
1480	complete	sparse	2.08	1.93	0.01	0.026	16	—	4	—	20	769.231
1519	partial	moderate	0.75	0.63	0.01	0.003	—	—	—	—	—	—
1535	partial	indeterminate	1.35	1.35	0.04	0.056	1	—	—	—	1	35.714
3073	complete	indeterminate	3.00	2.20	0.05	0.250	4	—	2	2	8	31.873
3535	partial	indeterminate	0.84	0.67	0.01	0.004	—	1	—	—	1	500.000
3583	partial	sparse	0.51	0.46	0.01	0.001	2	—	—	—	2	2,000.000
Early Archaic to Pioneer Period												
11418	sampled	sparse	0.70	0.63	0.08	0.038	—	—	—	—	—	—
11440	partial	sparse	0.24	0.19	0.03	0.004	—	—	—	—	—	—
Chiricahua Phase												
2476	examined	indeterminate	0.73	—	0.10	0.159	—	—	—	—	—	—
2484	examined	indeterminate	1.25	—	0.09	0.196	—	—	—	—	—	—
2832	examined	indeterminate	1.45		0.06		—	—	—	—	—	—
7623	partial	indeterminate	1.13	1.00	0.03	0.028	—	—	—	—	—	—
7878	partial	moderate	3.30	3.30	0.25	1.712	1	—	—	5	6	7.009
10577	sampled	moderate	0.99	0.73	0.08	0.029	—	—	—	—	—	—
10578	partial	moderate	0.74	0.61	0.13	0.066	—	—	—	—	—	—
10857	sampled	sparse	0.40	0.25	0.03	0.012	—	—	—	—	—	—
14617	sampled	sparse	1.20	1.10	0.09	0.104	1	—	2	9	12	230.769
14636	examined	indeterminate	0.63	0.48			—	—	—	—	—	—

continued on next page

Feature No.	Level of Effort	Density of Burned Materials in Fill	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
15408	sampled	abundant	0.70	0.70	0.03	0.015	—	—	—	—	—	—
15454	sampled	sparse	0.75	0.75	0.05	0.013	—	—	—	—	—	—
18154	sampled	moderate	0.50	0.43	0.03	0.006	—	—	—	—	—	—
18245	sampled	sparse	0.80	0.75	0.03	0.011	—	—	—	—	—	—
18257	sampled	sparse	0.50	0.45	0.01	0.002	—	—	—	—	—	—
Middle to Late Archaic Period												
3693	partial	moderate	0.51	0.50	0.01	0.002	—	—	8	—	8	8,000.000
3992	partial	moderate	0.23	0.19	0.02	0.001	—	—	2	—	2	—
3998	partial	sparse	0.54	0.48	0.03	0.003	—	—	—	—	—	—
4265	examined	indeterminate	0.70	0.70			—	—	—	—	—	—
10621	sampled	sparse	0.80	0.76	0.09	0.048	—	—	—	—	—	—
10625	partial	moderate	4.00	4.00	0.25	2.645	2	1	—	1	4	3.023
15102	examined	indeterminate	0.87	0.84			—	—	—	—	—	—
15483	partial	moderate	0.80	0.74	0.04	0.032	—	—	5	—	5	312.500
Middle Archaic to Pioneer Period												
3295	partial	indeterminate	0.55	0.50	0.04	0.010	—	—	—	—	—	—
3853	partial	nonexistent	0.40	0.27	0.08	0.008	—	—	—	—	—	—
18213	examined	indeterminate	0.68	0.66			—	—	—	—	—	—
19503	partial	abundant	6.15	3.20	0.49	6.360	—	1	1	—	2	0.629
Middle Archaic to Protohistoric Period												
11261	partial	sparse	0.45	0.20	0.03	0.014	—	—	—	—	—	—
11300	partial	indeterminate	0.46	0.44	0.03	0.010	1	—	—	—	1	200.000
11314	examined	nonexistent	0.56	0.52			—	—	—	—	—	—
Late Archaic to Pioneer Period												
13034	sampled	sparse	1.20	0.60	0.04	0.005	—	—	—	10	10	5,000.000
14688	sampled	sparse	0.40	0.30	0.03	0.010	—	—	—	1	1	200.000
14833	sampled	sparse	0.85	0.76	0.04	0.012	—	—	—	—	—	—
15172	sampled	sparse	0.72	0.40	0.12	0.049	—	—	—	—	—	—
15196	sampled	sparse	1.00	0.66	0.06	0.013	—	—	—	3	3	500.000

Feature No.	Level of Effort	Density of Burned Materials in Fill	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
15212	sampled	sparse	0.70	0.50	0.06	0.025	1	—	13	—	14	1,166.667
Late Archaic to Protohistoric Period												
3794	partial	moderate	0.61	0.59	0.11	0.025	—	—	—	—	—	—
3964	partial	indeterminate	1.53	1.10	0.12	0.024	1	—	—	—	1	83.333
11402	partial	sparse	0.57	0.42	0.08	0.015	—	—	—	—	—	—
15041	sampled	sparse	1.50	1.45	0.06	0.064	—	1	—	—	1	31.250
Cienega Phase												
1350	partial	moderate	0.40	0.28	0.01	0.007	1	—	—	—	1	333.333
1508	partial	sparse	0.35	0.29	0.07	0.013	—	—	—	—	—	—
Late Cienega to Red Mountain Phase												
2537	partial	sparse	6.05	3.25	0.30	4.527	5	—	4	7	16	7.067
10662	sampled	sparse	1.00	0.88	0.14	0.108	—	—	—	—	—	—
10668	sampled	sparse	0.46	0.43	0.06	0.021	1	—	—	—	1	90.909
14689	sampled	sparse	0.50	0.49	0.08	0.023	1	—	—	—	1	83.333
Red Mountain Phase												
14656	partial	abundant	10.55	6.70	0.30	17.151	88	—	6	—	94	10.961
Pioneer to Classic Period												
11027	partial	sparse	0.32	0.22	0.01	0.005	—	—	—	—	—	—
11138	partial	sparse	1.70	1.68	0.03	0.054	—	—	—	6	6	222.222
14801	sampled	sparse	0.70	0.50	0.12	0.024	—	—	—	—	—	—

[a] Artifact-density calculations are based on level of effort; therefore, partially excavated features have artifact densities based on the percentages of the features excavated.

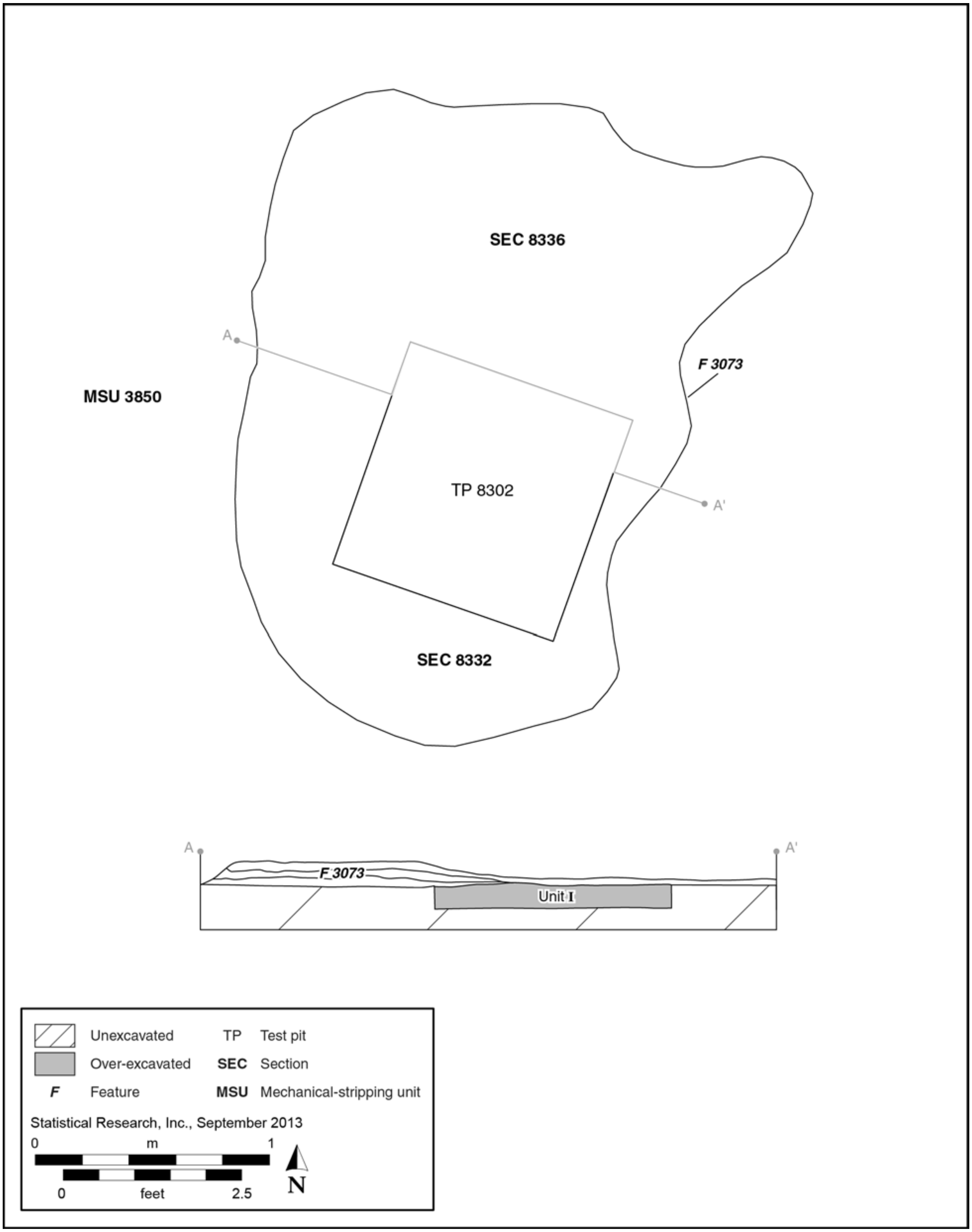

Figure 144. Mid-excavation plan view and cross section of Feature 3073 (a charcoal/ash lens) at Falcon Landing.

Feature Fill

Three distinct strata were observed in profile after SEC 8332 was excavated (see Figure 144). The uppermost stratum consisted of a 1.5-cm-thick, loose, dark grayish brown, ash-laden deposit with sand and silt. No inclusions were observed. A middle stratum was observed below the uppermost stratum and consisted of a 2.5-cm-thick, loose, light yellowish brown, ash-laden silty loam with occasional small calcium-carbonate inclusions. The lowermost stratum consisted of a 1-cm-thick, loose, dark grayish brown, ash-laden silty loam similar to the uppermost stratum. Some insect and root disturbances were noted throughout the fill. Artifacts recovered from Feature 3073 included three pieces of flaked stone debitage, two pieces of faunal bone, two pieces of FAR, and a hammerstone fragment.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 3073 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the surface of Unit I and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2), placing the feature in the Early to Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

The internal stratigraphy observed for Feature 3073 suggests that ash-laden sediments were deposited on the aboriginal ground surface in at least three episodes. After the uppermost stratum of ash was deposited, natural alluvial and aeolian sediments covered the feature.

Stratigraphic Relationships and Associated Features

Feature 3073 was adjacent to four nonthermal pits (Features 3662, 3785, 11422, and 11424), two thermal pits (Features 3057 and 11423), and an FAR concentration (Feature 3663) (see Appendix A). The above features all share the same stratigraphic position as Feature 3073 and are dated to the Early to Late Archaic period.

Red Mountain Phase Component

Feature 14656

Feature type: charcoal/ash lens
Age: Red Mountain phase
Locus: Area A
Grid location: H5
Level of effort: partial
Plan-view shape: irregular

Cross-sectional shape: flat
Length (m): 10.55
Width (m): 6.70
Excavated depth (m): 0.30
Volume (m^3): 17.151

Excavation Methods

Feature 14656 was a large charcoal/ash lens located in the east-central portion of Area A (see Appendix A). Feature 14656 was originally identified during mechanical excavation of MSU 14596 as a large, amorphous charcoal- and ash-laden deposit. A 1-by-1-m control unit (TP 17865) was placed in the western portion of the feature (Figure 145). TP 17865 was excavated in 10 arbitrary 10-cm levels, to determine the depth of Feature 14656. The cultural deposits corresponding to Feature 14656 were limited to the upper 30 cm (Levels 1–3) of TP 17865 (Figure 146), and Levels 4–10 were excavated through natural site sediments (for a more in-depth discussion of the natural site sediments in TP 17865, see the Nonfeature Deposits section,

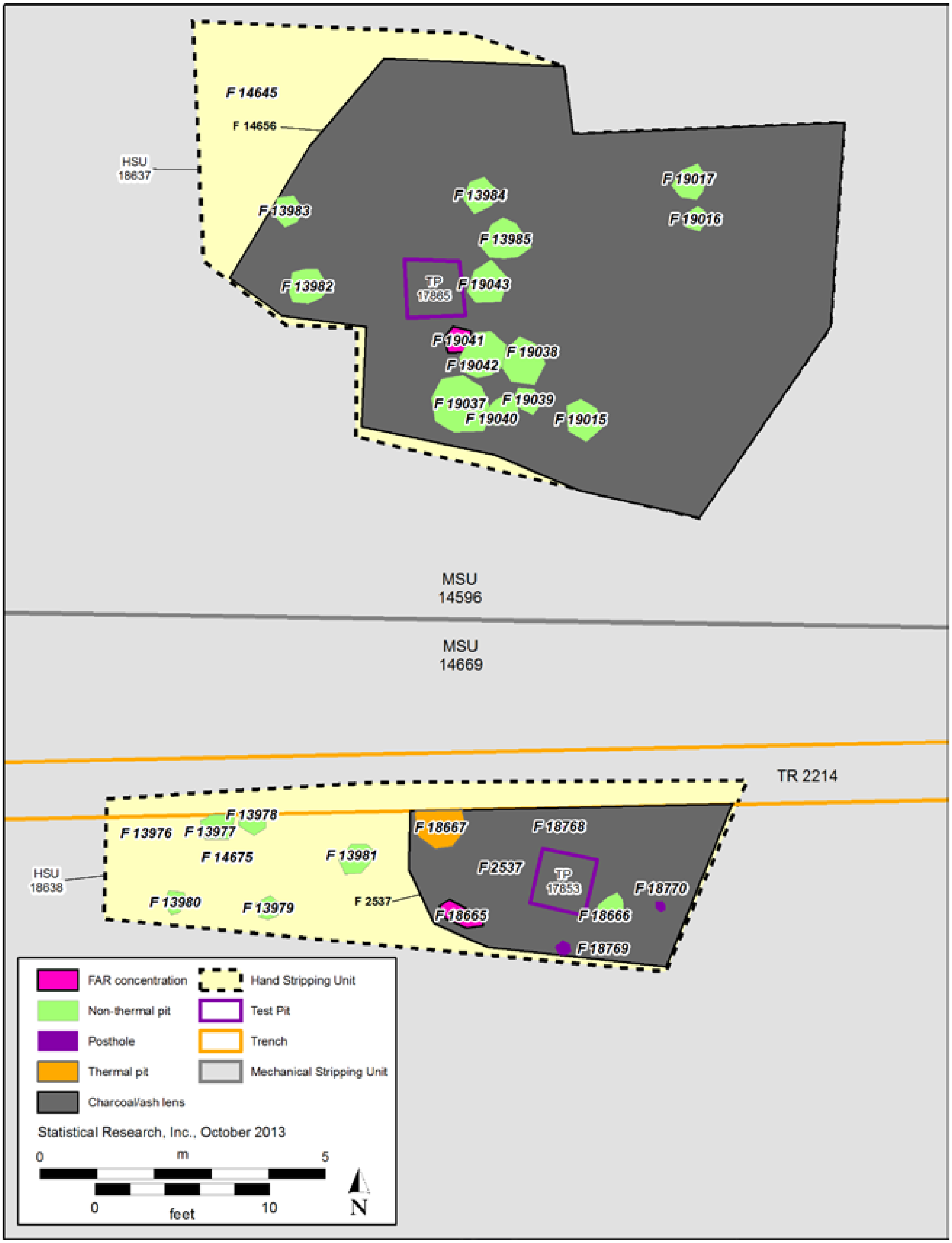

Figure 145. Plan view of Features 14656 and 2537 (charcoal/ash lenses) and HSUs 18637 and 18638, which were excavated to define the plan view, also showing the locations of TPs 17853 and 17865, which were excavated to determine feature depth. Note the numerous pits that were identified during the excavation of HSUs 18637 and 18638.

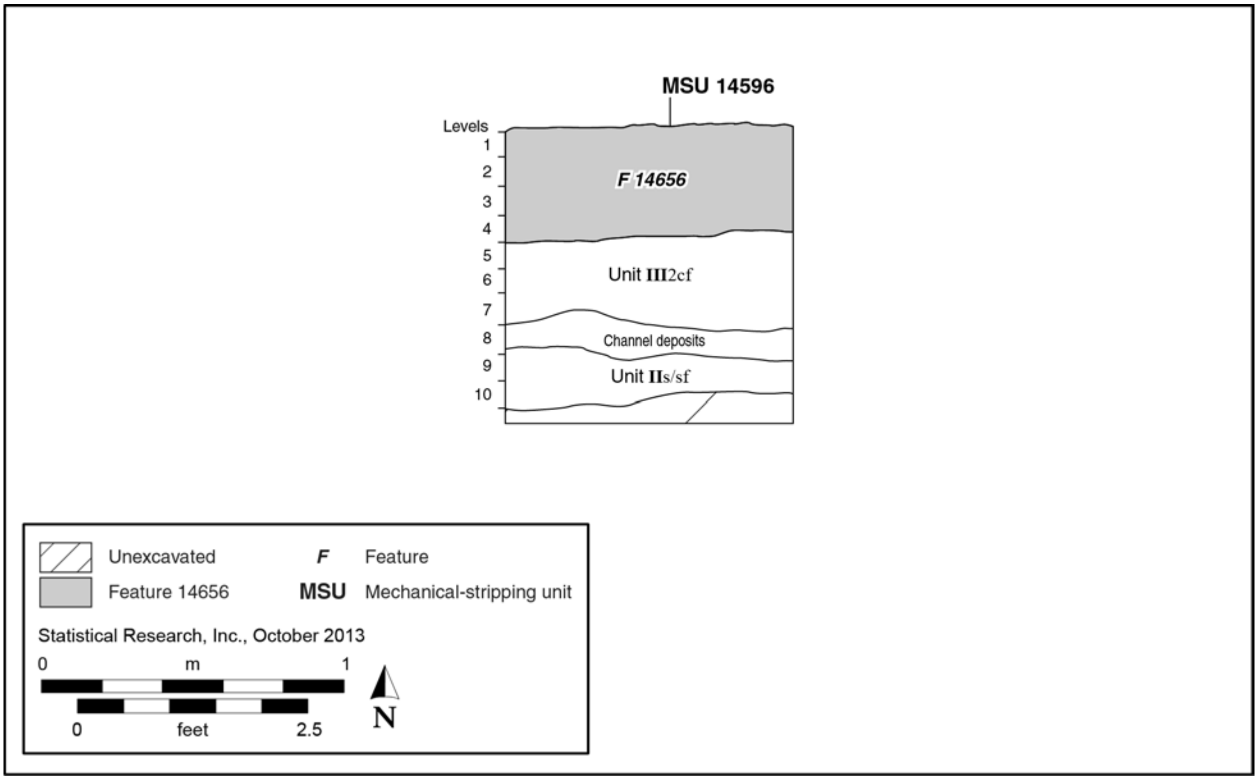

Figure 146. Profile of Feature 14656 (a charcoal/ash lens), in the northern face of TP 17865, at Falcon Landing.

this chapter). In order to better define Feature 14656 in plan view, HSU 18637, measuring 10 by 8.5 m, was placed over the boundary of the feature. HSU 18637 was excavated stratigraphically in one approximately 5-cm level and uncovered 15 extramural-pit features that intruded upon Feature 14656 (see Figure 145).

Feature Fill

The fill of Feature 14656 consisted of a single homogeneous deposit of loose, ashy-gray silt loam with abundant charcoal (see Figure 146). Artifacts recovered from Feature 14656 included 88 pieces of flaked stone debitage and 6 pieces of faunal bone, all from TP 17865. Level 1 of TP 17865 contained 6 pieces of faunal bone and 38 pieces of debitage, Level 2 contained 37 pieces of debitage, and Level 3 contained 13 pieces of debitage. The excavation of TP 17865 continued below Feature 14656, and additional artifacts were recovered from the lower levels (see the Nonfeature Deposits section, this chapter).

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 14656 originated within Unit III2cf, which has a date range of ca. 160 cal. B.C.–cal A.D. 340 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of charred mesquite (*Prosopis* sp.) wood was collected from Level 1 of TP 17865, corresponding to the fill of Feature 14656. The charcoal sample was submitted to Aeon for AMS dating and produced a 2σ calibrated date range of cal. A.D. 70–250 (Aeon Sample No. 1516), indicating that the feature dated to the Red Mountain phase of the Early Ceramic period.

Abandonment Processes

Feature 14656 was likely deposited in one or more episodes, as indicated by the 30-cm depth identified in the profile of TP 17865. Once the sediments associated with Feature 14656 were deposited, numerous extramural-pit features were excavated into the fill of Feature 14656. After abandonment of these intrusive features, the area was covered with natural alluvial sediments.

Stratigraphic Relationships and Associated Features

In total, 15 features intrude upon Feature 14656 (see Figure 145): 14 nonthermal pits (Features 13982, 13983, 13984, 13985, 19014, 19015, 19016, 19017, 19037, 19038, 19039, 19040, 19042, and 19043) and 1 FAR concentration (Feature 19041) (see Appendix A). Another large charcoal/ash lens (Feature 2537) is located about 5 m to the south and is intruded upon by a thermal pit (Feature 18867), a nonthermal pit (Feature 18666), and 3 postholes (Features 18768, 18769, and 18777) (see Table 7). Surrounding Features 14656 and 2537 are numerous other extramural pits and FAR concentrations (see Appendix A).

Extramural-Pit Features

The feature type with the most numerous examples encountered at Falcon Landing was, by far, the extramural pit. Indeed, over 90 percent (2,738 of 3,006) of the features at Falcon Landing were pits. As noted in Chapter 3, pits were discovered either by trench profiling or, more commonly, during mechanical-stripping efforts. In total, 2,738 pits were encountered at Falcon Landing. Of these, in accordance with the HPTP (Hall et al. 2011), a sample of 1,396 pit features were excavated and documented (see Table 7), including 1,098 nonthermal pits, 17 nonthermal bell-shaped pits, 272 thermal pits, and 9 thermal bell-shaped pits. The methods employed to select and excavate this sample set were described in Chapter 3.

The challenges inherent in excavating such a large sample of pits are matched by the challenges of describing the attributes of these features. What sets Falcon Landing apart from other sites described in this volume is the number of features identified and excavated within its boundaries. As noted above, Falcon Landing contained 1,396 extramural pits, whereas Site 68 contained 33 extramural pits, Site 437 contained 17 extramural pits, and Site 423 contained just 3 extramural pits. Chapters 5, 8, and 6, respectively, contain descriptions of all features excavated within the boundaries of these sites, including the extramural pits. Providing detailed feature descriptions for the thousands of extramural pits at Falcon Landing would require an unwise allocation of resources, and any variation among the pits would be obscured in such a high-resolution examination. Instead, only a sample of the excavated pits will be described here. Rather than randomly choosing among the nearly 1,400 excavated pits, the investigation below allows us to select a sample of pits based on how representative of or disparate from the whole they are. Additionally, this approach allows us to make general statements about the characteristics of all the excavated pits at Falcon Landing by discussing the distribution of pits according to morphometric attributes.

Various metrics for each pit, including dimensions and contents, are presented in Appendix C. Although the large number of pits precludes discussion on a feature-by-feature basis, the sample set does afford a unique opportunity to apply quantitative analyses to several morphometric pit attributes. In the following sections, the authors will describe four pit attributes, how they were recorded, the geometric methods used to examine some of those attributes, and the statistical methods used to compare pit attributes. The result of these analyses is a set of pit classifications based on the sizes, shapes, and physical properties of the extramural pits at Falcon Landing. These classifications serve two purposes. First, as noted above, categorizing the hundreds of pits excavated at Falcon Landing provided a basis for selecting which subset of pits would be described in detail in this chapter. The selection criteria emphasized the variations among pits of particular types, indicating which were representative of the whole and which were outliers.

The second function of categorizing the pits was to provide additional lines of inquiry for deciphering pit function and behavioral patterns across the APE. Chapter 10, Volume 2, of this report will seek to examine site structure and land use at the sites on LAFB and will include comparisons of extramural pits across space and time, differences in their contents and abandonment processes, and comparisons to similarly constructed intramural pits. It is important to note that this section discusses the methods employed to arrive at just one set of characteristics used in those investigations. In other words, such attributes as pit contents and spatial and temporal patterning are beyond the scope of the descriptive treatment of Falcon Landing extramural pits in this chapter and will be discussed further in Chapter 10, Volume 2.

Extramural-Pit Attributes as Variables

Classifying pits requires a set of attributes that can illuminate meaningful distinctions or similarities among them. Several attributes were recorded for all 1,396 excavated pits, including size, shape, contents, and evidence of thermal alteration. The present discussion focuses on a selection of those attributes best suited for comparison across all pit features in the sample: (1) evidence of in situ burning, (2) cross-sectional shape, (3) pit volume, and (4) pit shallowness.

The four attributes under examination can be divided into two types of observations. Evidence of in situ burning and pit cross-sectional shape were both directly observed in the field, were recorded during feature excavation, and required no calculation or data analysis. They are mutually exclusive, nominal traits: pits either did or did not show evidence of in-situ burning, and pits exhibited a particular cross-sectional shape, exclusive of all others. For these attributes, the values recorded in the field required no further standardization.

Pit volume and pit shallowness, however, are attributes calculated from measurements taken either by field staff during excavation or by cartographic staff during total-station mapping. These attributes required standardization and inclusion into formulas to achieve a cohesive data set from which to make comparisons and draw conclusions. The data were examined as elements in geometric analyses, to investigate their contributions to pit size and shape, and were then examined statistically, to investigate their distributions among other pits. The methods used for these analyses are described in later sections.

Evidence of In Situ Burning

Upon discovery, every pit feature was initially evaluated for evidence of in situ burning. The most compelling evidence was oxidized pit walls, which indicate that burning occurred in the pit. The presence of oxidized sediments in pit fill was deemed inadequate to indicate in situ burning within the pit, because the sediments that contributed to a pit's fill did not necessarily originate in that pit; indeed, the oxidized sediments encountered in one pit may represent the cleanout from an adjacent feature. Therefore, only clear oxidation of the pit walls or pit bottom was sufficient to suggest in situ burning. Pits exhibiting in situ burning were given the modifier "thermal." Pits not exhibiting oxidized walls or bottoms were considered "nonthermal." All pits were determined to be either thermal or nonthermal based on direct field observation.

Cross-Sectional Shape

Each pit was evaluated for its cross-sectional shape during excavation. Although several values are available for this attribute, the pits within the APE could all be characterized as either bell shaped or basin shaped in cross section. Bell-shaped pits have been recognized as elements of the Archaic period in the Southwest since the 1940s (Sayles 1983, see also Sayles and Antevs 1941), and noting whether or not pits were bell shaped was included in the excavation protocol. Of the 1,396 extramural pits excavated at Falcon Landing, only 35 were identified in the field as bell shaped. The remaining 1,361 pits were generally basin shaped in cross section. Although some variability was observed in the non-bell-shaped cross sections, the pits were overwhelmingly consistent—enough to reduce the sample set to the two cross-sectional shapes of bell shaped and basin shaped.

For the purposes of the present investigation, the distinction between the two types of pit cross-section—bell shaped and basin shaped—was based on two important assumptions about the relationship between the maximum diameter of a pit and the pit orifice. Basin-shaped pits were assumed to express their maximum diameters at the pit orifices. The significance of this assumption is that the pit outline when a feature was first encountered (and subsequently total-station mapped) represented the largest horizontal area of the pit. Thus, for basin-shaped pits, pit diameter decreased with depth.

The analysis of bell-shaped pits relies on a different assumption. For bell-shaped pits, the maximum pit diameter is *not* at the pit orifice. This is the defining characteristic of bell-shaped pits. Thus, the pit outline when a feature was first encountered does not represent the maximum diameter of the pit. The maximum pit diameter occurs at some point below the pit orifice. Thus, unlike basin-shaped pits, the area of the pit mapped by total station is not equivalent to the maximum pit diameter for bell-shaped pits.

Additionally, all bell-shaped pits observed at Falcon Landing shared a common trait in their construction: each bell-shaped pit expanded horizontally directly below its orifice, without a necked section separating the body of the pit from the opening. Although it is possible that necks were mechanically stripped away before the features were identified, it is unlikely that this occurred in every case. The consistency in bell-shaped-pit form allowed for a uniform approach to geometrically analyzing both bell-shaped and basin-shaped pits according to a single model, as described below.

Pit Volume

Calculating pit volume allows estimation of total usable volume, for a variety of meaningful behavioral inferences, such as the potential extent and changes in the relative proportions of food-processing, -preparation, or -storage activities. The size of a pit is best expressed by volume, which represents the maximum amount of material the pit could potentially contain. Pit volume also provides insight into pit construction, because the volume of a pit also represents the amount of sediment that had to be removed in order to create that pit. Similarities and differences in pit volume can help in classifying pit function based on the characteristics of pit construction, such as the amount of effort required to dig pits for particular purposes. In other words, the size of a pit corresponds to its function by way of the effort required to create the pit for its intended purpose(s). The processes and calculations required to determine pit volume are discussed below.

Pit Shallowness

Pit shallowness is an attribute of pit geometry that helps to establish a quantifiable mechanism for comparing pit shape—specifically, the relationship between the horizontal and vertical dimensions of a pit. If a pit is larger horizontally than it is vertically, the pit is shallow. If the pit is smaller horizontally than it is vertically, the pit is deep. Like pit volume, pit shallowness provides insight into the functional morphology of a pit by suggesting whether orifice width or overall depth was preferred. Additionally, pit shallowness serves to further examine differences within the cross-sectional-shape categories of basin shaped and bell shaped. The calculations employed to determine pit shallowness are discussed below.

Pit Volume and Shallowness Calculations

Field measurements of extramural-pit dimension are useful mechanisms for comparing pits according to a standardized set of criteria. Previous investigations have utilized measures of pit length, width, and depth to calculate various indices and ratios, to compare pit size and shape. Gregory (2001b) and Wegener and Deaver (2011) calculated pit-orifice diameters by taking the square root of the pit length at the orifice, multiplied by the pit width at the orifice. This effectively reduced the horizontal dimensions of the pit orifice to a single linear measure, equivalent to the diameter of a perfect circle. Similarly, Gregory (2001b) and Graves (2011) calculated pit volume in similar ways:

$$V = \pi \times \left(\frac{\sqrt{(l \times w)}}{2}\right) \times d$$

Where V is volume (m^3), l is pit-orifice length, w is pit-orifice width, and d is pit depth. The result of this equation is the volume of a perfectly cylindrical object. This appears to be the same method employed by Wöcherl (2005) to compare mean excavated volumes of extramural pits.

The present investigation differs from previous efforts in two important ways. First, for basin-shaped pits, the area of a pit orifice was generated from total-station-mapping efforts. As noted in Chapter 3, a key component of field data collection was the mapping by total station of all encountered features. A polygon representing the feature boundary was recorded as a closed polygon, and its area was calculated by the fill method. Thus, the area generated by total station boasts submillimeter precision as well as accuracy in the actual shape of a feature polygon. Although all extramural-pit features are assumed to be round or subround in plan view, they were not necessarily perfect circles, unlike what would be generated by diameter-index calculations.

Second, as noted above, the pits at Falcon Landing were either bell shaped or basin shaped in cross section. Both of these shapes exhibit change between the pit orifice and the pit base. This is inconsistent with the cylindrical shapes generated by simply multiplying the pit depth by the orifice area as has been seen in previous studies. The present investigation employed volume calculations that more closely incorporated the cross-sectional shapes of the pits under examination.

To examine the characteristics of pit features statistically in such a large sample, a number of assumptions were required to standardize the cases in the data set. These assumptions were supported by field observations and allowed for consistency across the sample. They were as follows:

- All extramural-pit features are round or subround in plan view.
- All extramural-pit features are either bell shaped or basin shaped in cross section.
- For all basin-shaped pits, the pit orifice exhibits the maximum pit diameter.
- For all bell-shaped pits, the pit orifice does not exhibit the maximum pit diameter.

By proceeding under these assumptions, a set of basic geometric calculations could be used to make comparisons among pits and to better understand the attributes of individual pits.

For basin-shaped pits, the maximum pit diameter was generated as a product of total-station mapping. The area calculated was a fill method from the creation of a closed polygon that represented the pit orifice. Of the 1,396 excavated pit features, 1,251 (90 percent) were recorded as exhibiting circular or ovate plan-view shapes. Overwhelmingly, pit orifices were generally rounded. This observation is important, because it reasonably justifies a set of assumptions that were applied to the areas generated from mapping data. The area of an ellipse is calculated by the formula.

$$A = \pi(a)(b)$$

In this formula, a is the length of the major radius, and b is the length of the minor radius. Although the areas generated from mapping data are not calculated by way of a formula, we can assume that the constant π is incorporated into the area. This assumption is critical to the calculations for pit volume and shallowness, as described below.

Pit-Volume Calculation

The project excavation methods did not include direct measurement of the amount of sediment removed from each feature. Thus, any discussion of pit volume is necessarily an exercise in surface geometry, using available measures to calculate the pit volume. Following the assumptions that each pit was generally round in both horizontal and vertical dimensions, we can apply modified geometric volume calculations to estimate pit volume.

To accomplish this, the formula for calculating the volume of an ellipsoid object was applied:

$$V = \frac{4}{3}\pi abc$$

In this formula, *a, b,* and *c* each represent a measure of distance from the ellipsoid center to its boundary in each of three Cartesian planes (Figure 147). The product of the formula is a measure of the volume of a roughly ball-shaped object. A basin-shaped pit, however, is analogous to only the bottom half of that solid shape. Thus, the volume for the basin-shaped pit is

$$V = \frac{\frac{4}{3}\pi abc}{2}$$

As noted above, an available metric is the pit-orifice area, and the pit-orifice area of a basin-shaped pit can be used to replace some values in the expression. The plan-view area of the pit orifice is equivalent to *πab*, and the pit depth is equivalent to vertical-radius *c*. Thus, the formula above is adapted as follows:

$$V = \frac{\frac{4}{3}(\mathit{plan\ view\ area})(\mathit{pit\ depth})}{2}$$

This calculation allows for comparison of the three-dimensional sizes of all the pits in the sample set. The importance of this distinction is that this half-ellipsoid volume calculation was applied uniformly to all basin-shaped pits (Figure 148).

Bell-shaped pits necessitated a different modification of the ellipsoid formula to calculate their volumes. First, as noted above, the assumption was made that the pit orifice recorded by total station did not reflect the

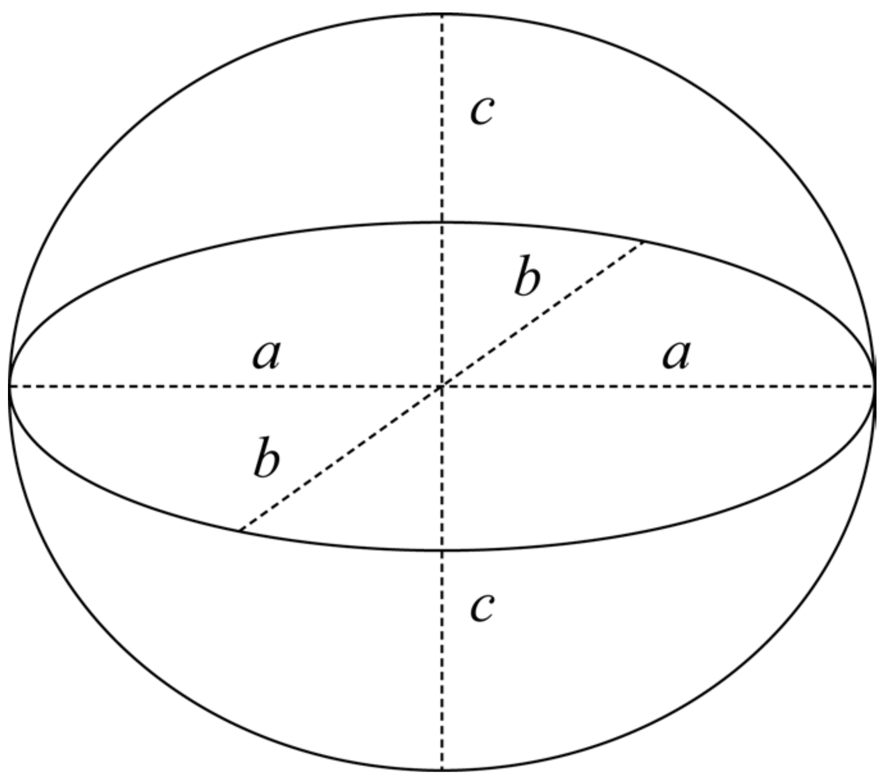

Figure 147. Three-dimensional ellipsoid shape with radii a, b, and c.

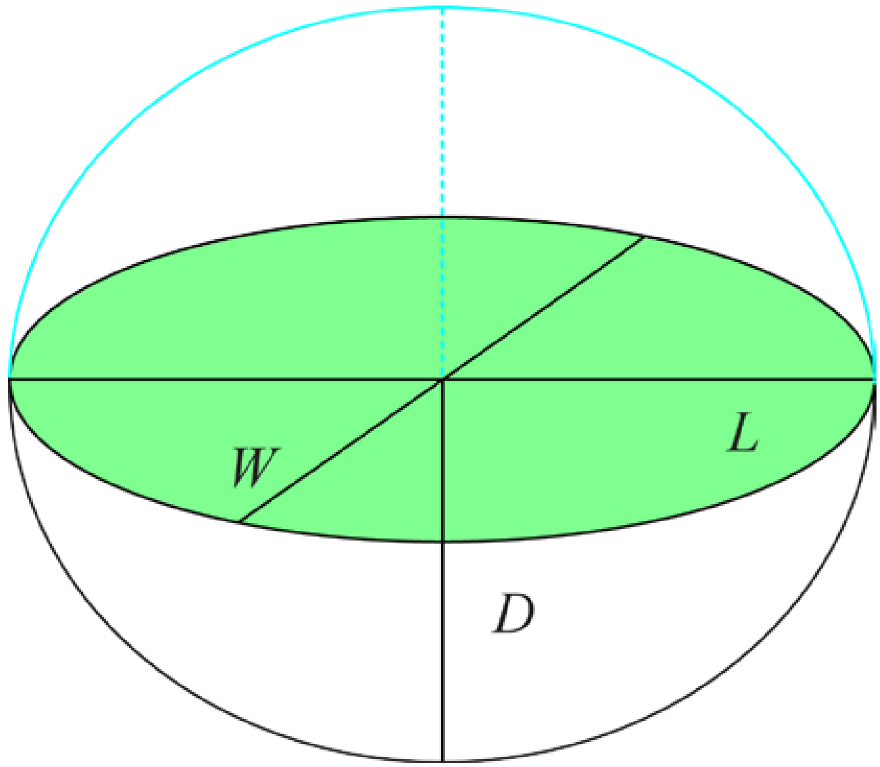

Figure 148. Basin-shaped-pit diagram as a half ellipsoid. The maximum length (L) and the maximum width (W) of the pit correspond to horizontal diameters 2a and 2b, respectively. The shading represents the plan-view area generated from the polygon mapped by total station. The pit depth (D) corresponds to vertical radius c.

maximum horizontal diameter of a pit. Instead, the maximum horizontal dimensions of a pit were at some depth below the surface and were recorded during excavation as maximum length and maximum width. Recalling that the ellipsoid-volume formula relies on radius measurements in three dimensions, maximum pit length and maximum pit width must each be halved to correspond to radius measurements. Thus, in the formula,

$$V = \frac{4}{3}\pi abc$$

$$a = \frac{maximum\ length}{2}$$

and

$$b = \frac{maximum\ width}{2}$$

In the formula above, *c* corresponds to pit depth and requires additional manipulation. As noted above, basin-shaped pits are analogous to the lower half of an ellipsoid. It follows then that bell-shaped pits approximate a greater portion of an ellipsoid, somewhere between 50 and 99 percent. This *ellipsoid proportion* varies on a case-by-case basis for each bell-shaped pit. To determine this proportion, scaled cross-section maps of the bell-shaped pits that were drawn in the field were examined. The shape of a bell-shaped pit in cross section allowed for an estimation of the percentage of a complete ellipsoid that bell-shaped pit represented. The ellipsoid proportion is expressed as a decimal between 0.50 and 0.99.

The ellipsoid proportion also allows for extrapolation of the linear depth measure recorded in the field to a vertical-dimension measure similar to the maximum length and maximum width of a pit (Figure 149). Essentially, pit depth represents a portion of a maximum height measure of a complete ellipsoid. Extrapolating the pit depth to a maximum height allows the measurement to be treated the same as maximum length and maximum width. Halving these dimensions corresponds to a radius measure for use in the ellipsoid-volume formula. Pit depth divided by the ellipsoid proportion results in an extrapolated ellipsoid maximum height, which is then halved, to equal a vertical radius:

$$c = \frac{\left(\frac{depth}{ellipsoid\ proportion}\right)}{2}$$

Finally, the entire extrapolated ellipsoid volume must be reduced, to reflect the ellipsoid proportion represented by a bell-shaped pit. This is accomplished by multiplying the ellipsoid volume by the ellipsoid proportion. Therefore, the volume for a bell-shaped pit is calculated as follows:

$$V = \frac{4}{3}\pi \left(\frac{max.\ length}{2}\right) \left(\frac{max.\ width}{2}\right) \left(\frac{\left(\frac{depth}{ellipsoid\ proportion}\right)}{2}\right) (ellipsoid\ proportion)$$

The results of the above calculations allow for comparison of the overall sizes of bell-shaped pits while incorporating the influence of their shapes on their volumes. As noted above, pit construction is an important

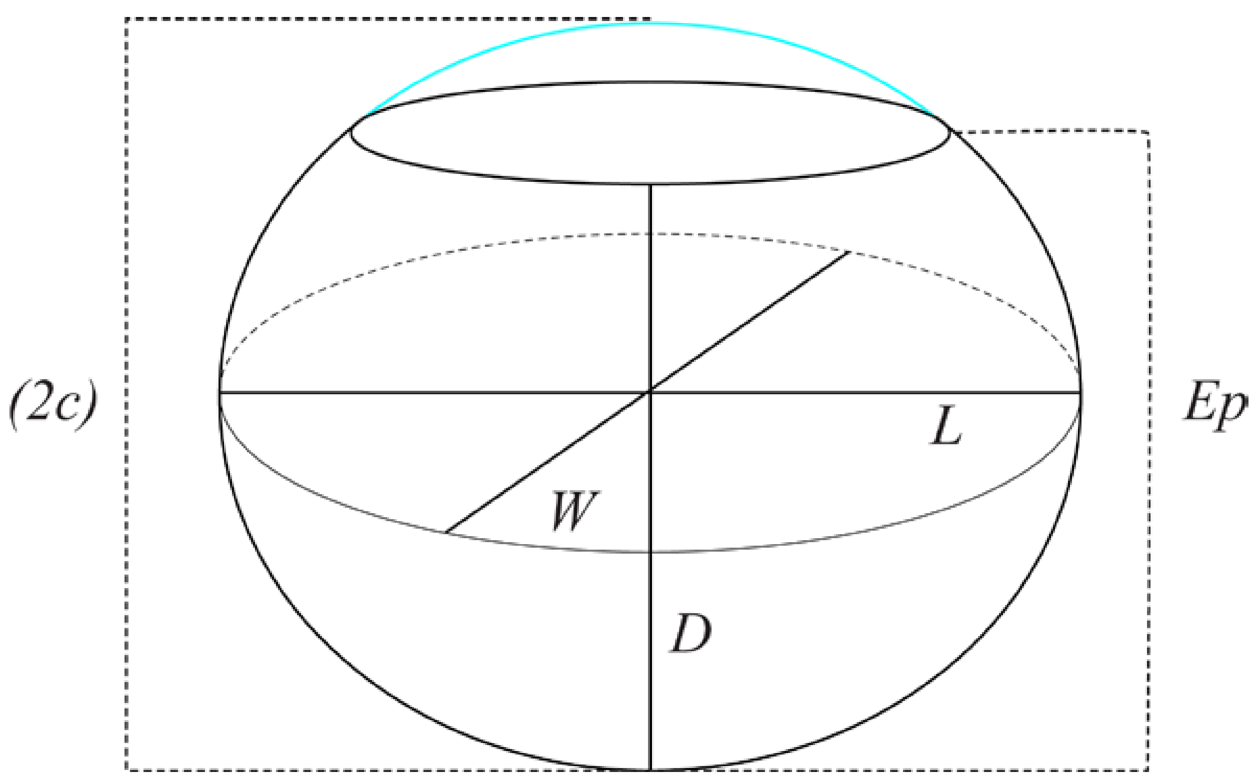

Figure 149. Bell-shaped-pit diagram as a portion of an ellipsoid. The maximum length (L) and the maximum width (W) of the pit correspond to horizontal diameters 2a and 2b, respectively. The ellipsoid proportion (Ep) is the amount of the full ellipsoid shape represented by the bell-shaped pit. The vertical diameter of the ellipsoid (2c) was determined by applying the ellipsoid proportion to the pit depth below the ground surface (D).

element in deciphering pit function, and the differences in overall shape between basin-shaped pits and bell-shaped pits must be examined with respect to the amount of sediment removed to create the pit.

Pit-Shallowness Calculations

The presumed ellipsoidal shape of all extramural pits allowed for an examination of how relatively deep or shallow each pit was. As noted above, the relationship between the horizontal and vertical extents of a pit can help shed light on pit function. To examine the relationship between horizontal and vertical elements of a pit, plan-view and depth measures taken during total-station recording and excavation were modified to allow for comparisons in two dimensions. As with the volume calculations, different sets of procedures were required for basin-shaped pits and bell-shaped pits. These separate calculations are justified, because comparisons were not made between cross-sectional-shape groups. In other words, basin-shaped pits were compared only to other basin-shaped pits, and bell-shaped pits were compared only to other bell-shaped pits.

For basin-shaped pits, the horizontal element of a pit is represented by the plan-view area recorded by total station. With the assumption that basin-shaped pits express their maximum horizontal diameters at the pit orifices, the total-station-mapped area is analogous to a planar section of a three-dimensional shape at its horizontal maximum. Because this planar section is expressed in two dimensions (m^2), it is necessary to modify the pit-depth measure to correspond to a vertical section. An orthogonal vertical section may be constructed from the depth measurement for comparison, in place of the radius in a circular area:

$$A = \pi(depth)^2$$

This calculation creates a disc shape in the vertical dimension that is analogous to the horizontal disc shape observed in plan view (Figure 150). The index of this observed horizontal disc and the artificial vertical disc permits a discrimination in which parity is the sectioning point:

$$Depth\ Index = \frac{\pi(depth)^2}{(maximum\ horizontal\ area)}$$

If the Depth Index is less than 1, then the pit is larger horizontally than it is vertically—a property recognizable as *shallow*. If the Depth Index is greater than 1, then the pit is larger vertically than it is horizontally, or *deep*.

As noted above, bell-shaped pits did not have their maximum horizontal areas mapped by total station, because the pit orifice was not the widest part of a pit. Instead, maximum length and maximum width were recorded along with pit depth during excavation. Similar to volume calculations for bell-shaped pits, the recorded maximum length and width measurements represent two horizontal measures of pit diameter. Thus, to create the horizontal disc analogous to the maximum planar area derived from total-station data for basin-shaped pits, the formula is as follows:

$$maximum\ horizontal\ area = \pi\left(\frac{length}{2}\right)\left(\frac{width}{2}\right)$$

Next, to treat the depth measure as a vertical radius, a calculation must be performed that is similar to what was applied to bell-shaped-pit volume:

$$maximum\ vertical\ area = \pi\left(\frac{\frac{depth}{ellipsoid\ proportion}}{2}\right)^2$$

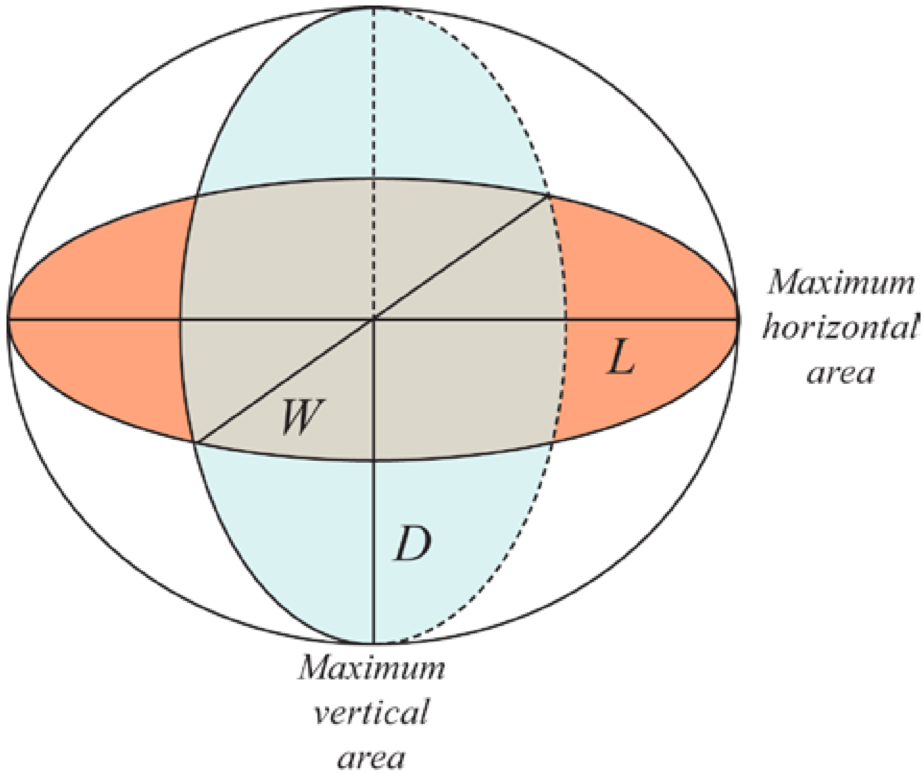

Figure 150. The Depth Index was determined by the relationship between the maximum horizontal area (generated from total-station polygons or calculated by length and width measures) to the theoretical maximum vertical area.

The Depth Index is calculated as

$$Depth\ Index = \frac{maximum\ vertical\ area}{maximum\ horizontal\ area}$$

Thus,

$$Depth\ Index = \frac{\pi \left(\dfrac{\dfrac{depth}{ellipsoid\ proportion}}{2} \right)^2}{\pi \left(\dfrac{length}{2} \right) \left(\dfrac{width}{2} \right)}$$

Again, if the maximum vertical area is greater than the maximum horizontal area, then the Depth Index will be greater than 1, and the pit is considered *deep*. Conversely, if the maximum horizontal area is greater than the maximum vertical area, then the Depth Index will be less than 1, and the pit is considered *shallow*.

The volume calculations and degrees of shallowness derived from excavation data were combined with evidence of in situ burning and cross-sectional shape to provide a suite of attributes useful in describing the properties of the 1,396 pits in the Falcon Landing controlled sample. The distributions of these attributes across the sample set allowed for the grouping of like features into a morphometric pit typology. The process and mechanism used to establish the project extramural-pit typology are described in the next section.

Analysis of Extramural-Pit-Feature Attributes

As noted in Table 7, 1,396 extramural-pit features were excavated at Falcon Landing. This represents a 51 percent sample of the 2,738 pits identified during trenching and mechanical stripping and the preliminary sample for the present investigation. The remaining 1,342 pits were examined during site-closure efforts (see Chapter 3). So, depth data were routinely missing from the information for these latter features, making them unsuitable for inclusion in this analytical sample set.

Eighteen of the 1,396 excavated pits were excluded from this investigation because they lacked the appropriate information to perform the statistical analyses. The most common reason for that was a lack of complete measurements because a trench truncated the pit. Removing these 18 cases resulted in a data set of 1,378 pits distributed among the following four groups: thermal bell-shaped pits, nonthermal bell-shaped pits, thermal basin-shaped pits, and nonthermal basin-shaped pits (Table 59).

What follows is a discussion of pit volume and depth, because they were observed within the four pit groups. These analyses will examine sample descriptive statistics to find grouping patterns within the pit groups. The goal of these discussions is to subdivide each pit group by size and depth in order to understand the range of variability in pit function and use across the occupational history of the site.

For pit volume, the grouping is directed by the mean and standard deviation of the sample data. Each standard deviation away from the mean is represented by a sigma value (σ). Thus, one standard deviation above the mean is indicated as 1σ, one standard deviation below the mean is indicated as –1σ, and so on, until all cases have been identified by their distances from the mean.

For pit shallowness, the Depth Index was used to determine whether a pit was *shallow* or *deep*. As noted above, the Depth Index is a measure of the relationship between the vertical and horizontal dimensions of a pit, with 1.0 representing an equal relationship. If the Depth Index is less than 1.0, then the pit is *shallow*. If the Depth Index is greater than 1.0, then the pit is *deep*. A summary of the range of variation in Depth Indices for each pit group appears below.

Table 59. Feature Types and Counts for Pits at Falcon Landing

Pit Type	Number
Thermal bell shaped	9
Nonthermal bell shaped	15
Thermal basin shaped	270
Nonthermal basin shaped	1,084
Total	1,378

Thermal Bell-Shaped Pits

In total, nine thermal bell-shaped pits excavated at Falcon Landing were examined as part of this analysis. Summary statistics of the pit attributes under examination are listed in Table 60, and the resulting categorizations are presented in Table 61 and Figure 151. Clearly, statistical analyses were frustrated by the small sample size of this pit group. Pit volumes were distributed from two standard deviations below the mean (–2σ) to three standard deviations above the mean (3σ). Most pits (n = 7), however, were within ±1σ. The largest grouping, containing nearly half the pits in this group (n = 4), was 1σ below the mean volume of 0.189 m^3. Although the sample was small, the distribution generally followed a normal distribution, with a greater number of cases near the mean and fewer cases farther from the mean. In terms of shallowness, all of the pits exhibited Depth Indices of less than 1, indicating that they were shallow.

Table 62 displays the distribution of thermal bell-shaped pits according to their volume sigma values and shallowness. Because none of the pits were deep, the volume distribution is among only shallow pits. As noted above, seven pits were within one standard deviation of the mean, with the largest number (n = 4) appearing in the –1σ category. This is likely a consequence of a single pit in the 3σ category, which had the statistical effect of driving up the mean volume. Nevertheless, the typical configuration of thermal bell-shaped pits was shallow and 1σ below the mean (i.e., 0.074–0.189 m^3) in volume.

Nonthermal Bell-Shaped Pits

In total, 15 nonthermal bell-shaped pits excavated at Falcon Landing were examined as part of this analysis. Summary statistics for these 15 pits appear in Table 63, and the resulting categorizations are presented in Table 64 and Figure 152. Pit volumes ranged from one standard deviation below the mean (–1σ) to three

Table 60. Descriptive Statistics for Thermal Bell-Shaped Pits at Falcon Landing

	Volume (m^3)	Depth Index
Mean	0.189222222	0.457217448
Standard Deviation	0.115573329	0.20516549
Range	0.424	0.659736297
Minimum	0.018	0.168421053
Maximum	0.442	0.82815735
Count	9	9

Table 61. Volume Sigma Values and Shallowness for Thermal Bell-Shaped Pits at Falcon Landing

Volume Sigma Values	Volume Range (m^3)	N	Percentage
–2	0–0.074	1	11
–1	0.074–0.189	4	44
1	0.189–0.305	3	33
2	0.305–0.421	—	
3	0.421–0.536	1	11
Shallowness			
Depth index <1 (shallow)		9	100
Depth index >1 (deep)		—	0

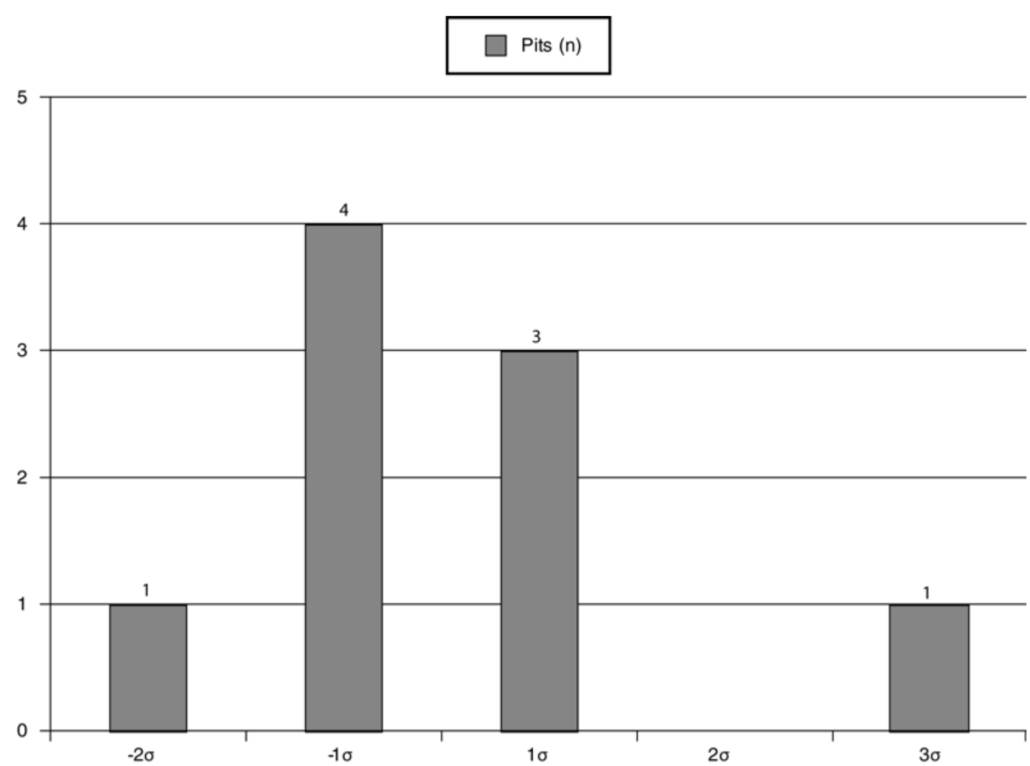

Figure 151. Volume sigma distribution for thermal bell-shaped pits at Falcon Landing.

Table 62. Volume Sigma Values and Shallowness Counts for Thermal Bell-Shaped Pits at Falcon Landing

Volume Sigma Value	Deep Features (n)	Shallow Features (n)	Total (n)
–2	—	1	1
–1	—	4	4
1	—	3	3
2	—	—	—
3	—	1	1
Total	—	9	9

Table 63. Descriptive Statistics for Nonthermal Bell-Shaped Pits at Falcon Landing

	Volume (m³)	Depth Index
Mean	0.217933333	0.559974794
Standard deviation	0.25179767	0.349265835
Range	0.8	1.035115104
Minimum	0.019	0.151022274
Maximum	0.819	1.186137379
Count	15	15

Table 64. Volume Sigma Values and Shallowness for Nonthermal Bell-Shaped Pits at Falcon Landing

Volume Sigmas Value	Volume Range (m³)	N	Percentage
–1	0–0.218	10	66.7
1	0.218–0.47	3	20
2	0.47–0.722	—	
3	0.722–0.974	2	13.3
Shallowness			
Depth index <1 (shallow)		13	87
Depth index >1 (deep)		2	13

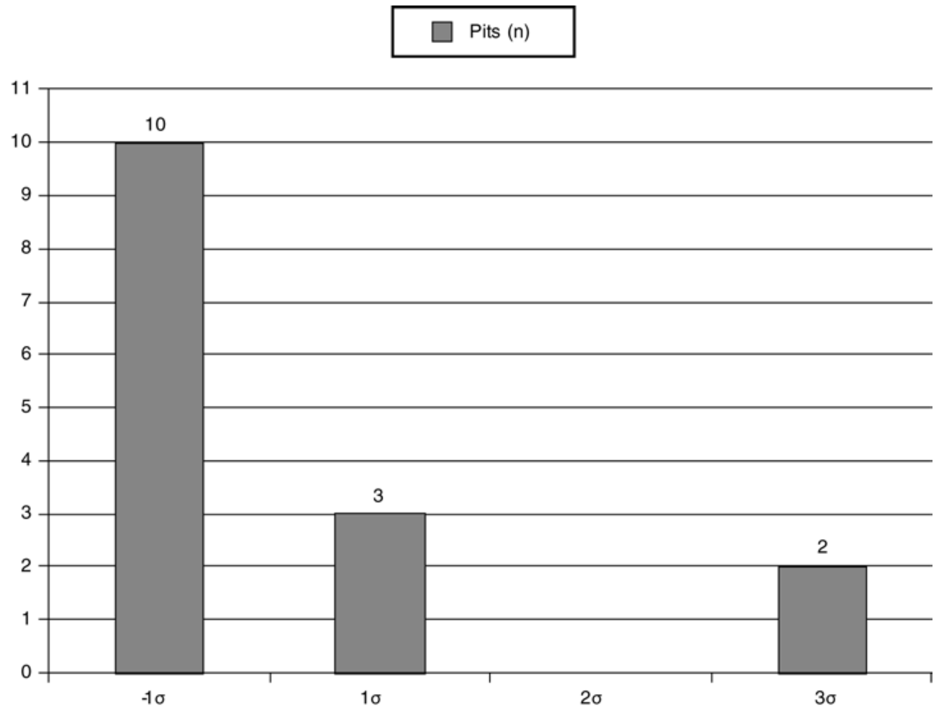

Figure 152. Volume sigma distribution for nonthermal bell-shaped pits at Falcon Landing.

standard deviations above the mean (3σ). The overwhelming majority of pits (n = 10, or 66.7 percent) were in the –1σ category. Three pits (20 percent) fell into the 1σ grouping, and the remaining two pits (13.3 percent) were in the 3σ category. Thus, 13 of 15 pits (86.7 percent) were within one standard deviation of the mean. In terms of shallowness, 13 pits (87 percent) showed Depth Indices of less than 1, indicating that they were shallow, and just 2 pits (13 percent) had Depth Indices of greater than 1, indicating they were deep. This division, although clearly uneven, demonstrates that the preference for shallow bell-shaped pits is strong, but not absolute.

Table 65 displays the distribution of nonthermal bell-shaped pits according to their volume sigma values and shallowness. For shallow pits, –1σ was the most frequent volume grouping, with 9 of the 13 pits falling into this category. Additionally, 1 of the 2 deep pits fell into the –1σ grouping. The 1σ category contained a single deep pit and 2 shallow pits. Finally, and perhaps most interestingly, the 3σ category included 2 shallow pits. This is surprising because the large volumes of these pits were not simply the product of greater depth. Rather, their large size maintained the common attribute among bell-shaped pits of being larger horizontally than vertically. Nevertheless, the most frequent configuration was shallow pits in the –1σ category, with 9 of the 15 total pits in the sample. Thus, the typical nonthermal bell-shaped pit was shallow and –1σ from the mean (i.e., 0.019–0.218 m^3) in volume.

Thermal Basin-Shaped Pits

In total, 270 thermal basin-shaped pits excavated at Falcon Landing were examined for this analysis. Summary statistics for these pits are presented in Table 66, and the resulting categorizations are found in Table 67 and Figure 153. The distribution of pits is interesting for a number of reasons. First, 195 of the 270 pits (72.2 percent) were smaller than the mean volume of 0.085 m^3. All of those 195 pits were within one standard deviation below the mean. Fewer cases (n = 47, or 17.4 percent) were within 1σ above the mean. Nevertheless, one standard deviation (both above and below the mean) represented 242 pits, or 89.6 percent of all pits in this group. This demonstrates significant consistency in volume among most sampled pits, and this consistency will be discussed more in later sections. The remaining 28 pits demonstrated some variability. The distribution of

Table 65. Volume Sigma Values and Shallowness Counts for Nonthermal Bell-Shaped Pits at Falcon Landing

Volume Sigma Value	Deep Features (n)	Shallow Features (n)	Total (n)
–1	1	9	10
1	1	2	3
3	—	2	2
Total	2	13	15

Table 66. Descriptive Statistics for Thermal Basin-Shaped Pits at Falcon Landing

	Volume (m^3)	Depth Index
Mean	0.085418519	0.35968598
Standard deviation	0.126151583	0.40823338
Range	0.805	2.09090933
Minimum	0.001	0.00349067
Maximum	0.806	2.0944
Count	270	270

Table 67. Volume Sigma Values and Shallowness for Thermal Basin-Shaped Pits at Falcon Landing

Volume Sigma Values	Volume Range (m^3)	N	Percentage
–1	0–0.085m^3	195	72.2
1	0.085–0.212	47	17.4
2	0.212–0.338	15	5.6
3	0.338–0.464	7	2.6
4	0.464–0.590	—	
5	0.590–0.716	4	1.5
6	0.716–0.843	2	0.7
Shallowness			
Depth index <1 (shallow)		246	91.1
Depth index >1 (deep)		24	8.9

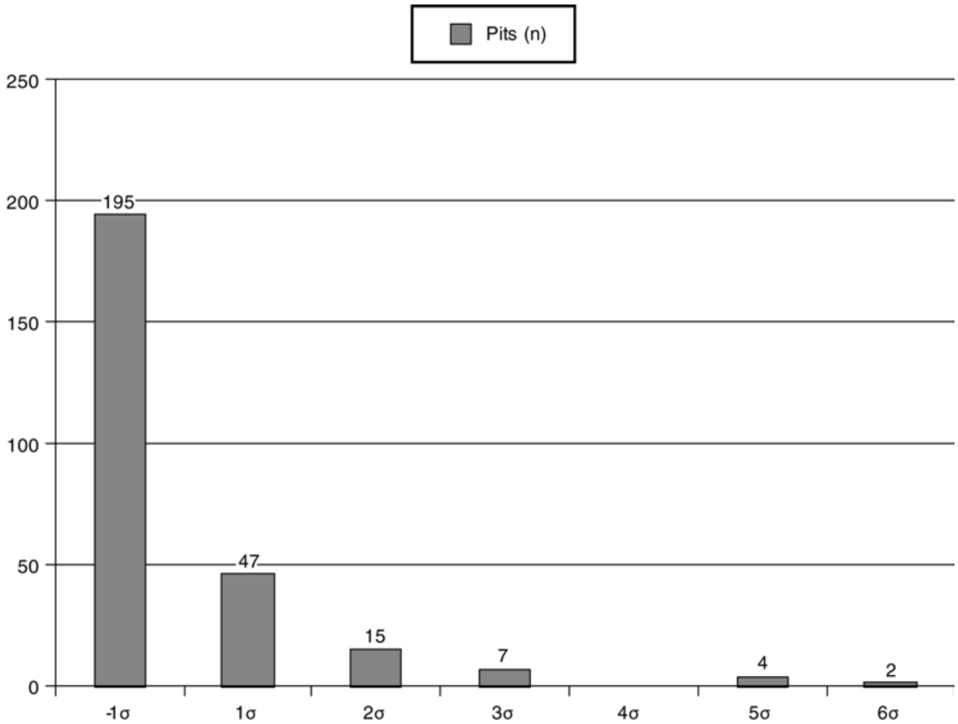

Figure 153. Volume sigma distribution for thermal basin-shaped pits at Falcon Landing.

these pits included 2 pits with volumes 6σ above the mean. In terms of shallowness, 246 (91.1 percent) of the 270 pits had Depth Indices of less than 1, indicating that they were shallow. The remaining 24 pits (8.9 percent) had Depth Indices of greater than 1, indicating that they were deep.

Table 68 shows the distribution of thermal basin-shaped pits according to their volume sigma values and shallowness. Clearly, shallow pits in the –1σ group for volume dominated the sample set, with 182 (67.4 percent) of the cases. Shallow pits in the 1σ group for volume were next most frequent, with 40 (14.8 percent) of the cases. The remaining pits decreased in frequency for both shallow and deep cases as volume moved farther from the mean. There were no deep pits in the 6σ grouping. Nevertheless, as Table 68 shows, for thermal basin-shaped pits, the typical configuration was shallow and one standard deviation below the mean (i.e., 0.001–0.085 m^3) in volume.

Nonthermal Basin-Shaped Pits

In total, 1,084 nonthermal basin-shaped pits were excavated at Falcon Landing and included observations suitable for these analyses. This pit type represents the largest portion of the sample set (78.7 percent). Summary statistics for these pits are displayed in Table 69, and the resulting categorizations are found in Table 70 and Figure 154. The distribution of nonthermal basin-shaped pits was similar to that of thermal basin-shaped pits. Specifically, the overwhelming majority of pits were one standard deviation below the mean for volume (767 of 1,084 pits, or 70.7 percent). The next-most-common grouping was one standard deviation above the mean, with 236 (21.7 percent) of the 1,084 cases. The combined –1σ and 1σ groups accounted for 1,003 (92.4 percent) of the nonthermal basin-shaped pits in the sample set. As with the thermal basin-shaped pits, the large proportion of pits within one standard deviation of the mean demonstrated the consistency in pit size for this group. Indeed, the range of volumes captured within the first standard deviations above and below the mean included pits 0.11 m^3 or smaller.

The remaining 81 pits outside the 1σ group did exhibit a considerable amount of variability. Groupings all the way to 12σ were required to encompass the full range of sizes of the nonthermal basin-shaped pits. As is the case with a normal distribution, the number of pits within each sigma decreased as the sigma value

Table 68. Volume Sigma Values and Shallowness Counts for Thermal Basin-Shaped Pits at Falcon Landing

Volume Sigma Value	Deep Features (n)	Shallow Features (n)	Total (n)
–1	13	182	195
1	7	40	47
2	2	13	15
3	1	6	7
5	1	3	4
6	—	2	2
Total	24	246	270

Table 69. Descriptive Statistics for Nonthermal Basin-Shaped Pits at Falcon Landing

	Volume (m^3)	Depth Index
Mean	0.043904244	0.424693458
Standard deviation	0.065894493	2.239004563
Range	0.825333333	69.394721850
Minimum	0.001333333	0.003222154
Maximum	0.826666667	69.397944000
Count	1,084	1,084

Table 70. Volume Sigma Values and Shallowness for Nonthermal Basin-Shaped Pits at Falcon Landing

Volume Sigma Value	Volume Range (m^3)	n	Percentage
–1	0–0.044	767	70.7
1	0.044–0.11	236	21.7
2	0.11–0.176	43	4.0
3	0.176–0.242	17	1.5
4	0.242–0.308	6	0.6
5	0.308–0.374	5	0.5
6	0.374–0.440	3	0.3
7	0.440–0.506	3	0.3
8	0.506–0.572	2	0.2
9	0.572–0.638	1	0.1
10	0.638–0.704	—	
11	0.704–0.770	—	
12	0.770–0.836	1	0.1
Shallowness			
Depth index <1 (shallow)		1,025	94.6
Depth index >1 (deep)		59	5.4

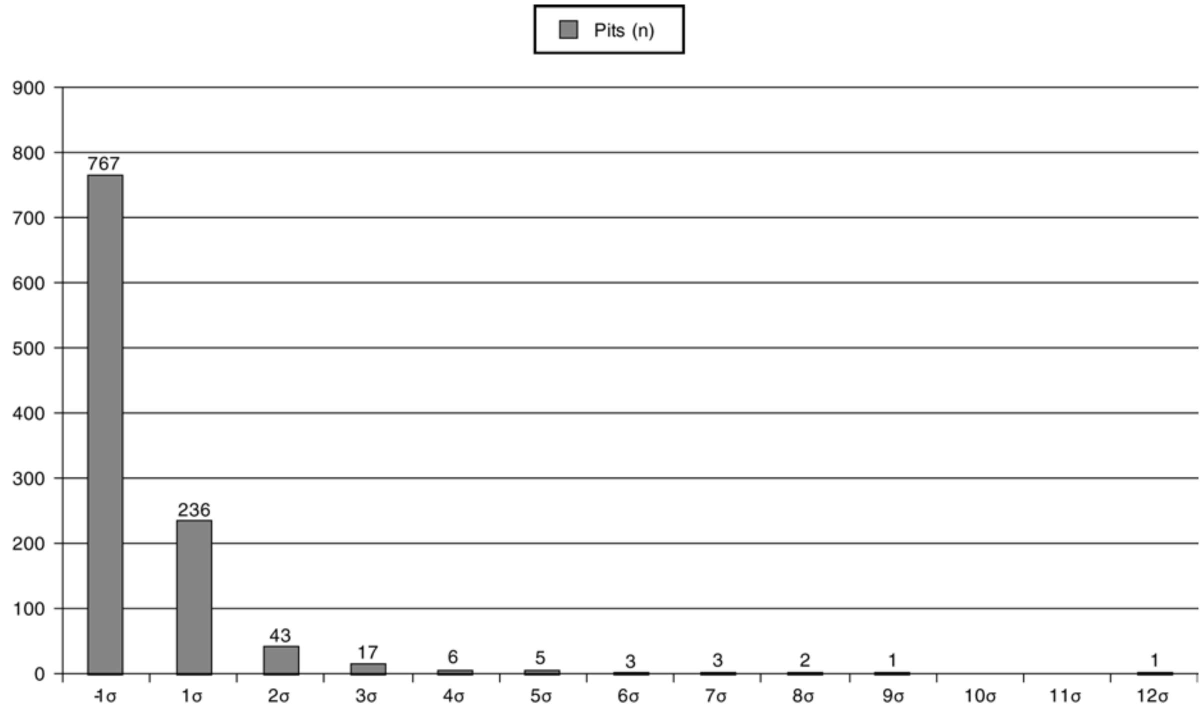

Figure 154. Volume sigma distribution for nonthermal basin-shaped pits at Falcon Landing.

moved farther from the mean. The 2σ group contained 43 pits (4.0 percent), and the 3σ group contained 17 cases (1.5 percent). The number of pits continued to decrease through 9σ, which contained just a single case. The 10σ and 11σ groups contained no pits. Finally, a single pit fell into the 12σ group. This and other outliers will be discussed in later sections.

In terms of shallowness, 1,025 (94.6 percent) of the 1,084 nonthermal basin-shaped pits showed Depth Indices of less than 1, indicating that they were shallow. This corresponds closely to the observations for thermal basin-shaped pits. Indeed, the ratio of shallow thermal pits to deep thermal pits was approximately 10:1 (or 90.8 percent shallow to 9.2 percent deep). For nonthermal basin-shaped pits, that ratio increased to nearly 20:1. These observations suggest uniformity in the construction of pits; with relatively few exceptions, nonthermal basin-shaped pits at Falcon Landing were dug in a manner that made them wider than they were deep.

Table 71 shows the distribution of nonthermal basin-shaped pits according to their volume sigma values and shallowness. The majority of the pits were shallow and within one standard deviation below the mean (727 of 1,084 pits, or 67.1 percent). Interestingly, this proportion is nearly identical to the shallow –1σ grouping for thermal basin-shaped pits (67.2 percent). Shallow pits in the 1σ group were the next most frequent, with 224 (20.7 percent) of 1,084 nonthermal basin-shaped pits. Also, like the distribution of thermal basin-shaped pits, the number of cases in each sigma group generally decreased as volume moved farther above or below the mean. The size distribution for the 59 deep pits followed the same general trend of decreasing frequencies of cases as sigma values moved farther from the mean. An interesting outlier, though, was a single deep pit in the 8σ group. It was the only deep pit above the 3σ group and one of only 4 pits above the 7σ group for the entire nonthermal-basin-shaped-pit sample set. This and other outliers will be discussed further in later sections. Nevertheless, as noted above, the typical nonthermal basin-shaped pit was similar to the typical thermal basin-shaped pit: shallow and one standard deviation below the mean (i.e., 0.001–0.044 m^3) in volume.

Table 71. Volume Sigma Values and Shallowness Counts for Nonthermal Basin-Shaped Pits at Falcon Landing

Volume Sigma Value	Deep Features (n)	Shallow Features (n)	Total (n)
–1	40	727	767
1	12	224	236
2	5	38	43
3	1	16	17
4	—	6	6
5	—	5	5
6	—	3	3
7	—	3	3
8	1	1	2
9	—	1	1
10	—	—	—
11	—	—	—
12	—	1	1
Total	59	1,025	1,084

Pit Classifications

As noted above, Falcon Landing contained an enormous number of extramural-pit features. A sensible approach to analyzing these features was to separate the sample set into smaller, mutually exclusive groups and to examine metric distributions within those groups. Four attributes were investigated: (1) evidence of in situ burning, (2) cross-sectional shape, (3) overall pit size, and (4) pit shallowness. Two of these attributes were directly observed and recorded during excavation. Evidence of in situ burning and cross-sectional shape allowed individual features to be classified as either thermal or nonthermal and as either bell shaped or basin shaped. These two attributes served as the basis for initial categorization. Because the data were nominal, no manipulation or preparation was required to place pits into these four categories. Indeed, part of the data-collection process immediately placed each pit into one of these four initial groups (see Table 59).

Pit size and shallowness were determined from geometric calculations based on excavation measures or cartographic data. It is sensible, then, to separate these results from the directly observed attributes of in situ burning and cross-sectional shape. Pit shallowness is, of course, binary: pits are either shallow or deep. The means by which this attribute was determined, however, was algebraic and geometric. Pit size was statistically examined through sample means and variances. The distribution of pit sizes was generally skewed toward smaller than the mean for each pit group, usually within the first standard deviation below the mean. This distribution resulted from a relatively small number of cases' expressing volumes dramatically above the mean, such as those in the 4σ group or higher.

Using pit size to contribute to an understanding of pit function, it seems sensible to focus attention on comparing the consistency and uniformity of the majority of pits to the pits that varied the most from that majority. As noted above, each pit was constructed for a purpose, and similarities among attributes can be assumed to represent similarities among functions. Thus, defining and examining what is a typical size and what is an atypical size for each pit group can assist in inferring function. In other words, the pit sizes encountered the most are related to the activities performed the most. The pit sizes encountered the least are related to the activities performed the least.

Using pit measurements to determine pit-shallowness and pit-size typicality allows two more binary attributes to be added to the attributes of evidence of in situ burning and cross-sectional shape. For reasons of economy, the permutations created by the two attributes of size and shallowness are expressed as a numeric code (1–4). Table 72 shows the four codes and their corresponding attribute combinations as well as the number of pits in the sample set that fell into each of those combinations.

Table 72. Number of Pits per Pit-Classification Code at Falcon Landing

Pit-Classification Code	Attribute Combination	n
1	typical volume, shallow	1,190
2	typical volume, deep	74
3	atypical volume, shallow	103
4	atypical volume, deep	11
Total		1,378

Table 73. Pit-Classification Names at Falcon Landing

Pit-Classification Name	Pit Attributes
NB1	nonthermal, bell-shaped, typical volume, shallow
NB2	nonthermal, bell-shaped, typical volume, deep
NB3	nonthermal, bell-shaped, atypical volume, shallow
NB4	nonthermal, bell-shaped, atypical volume, deep
NN1	nonthermal, basin-shaped, typical volume, shallow
NN2	nonthermal, basin-shaped, typical volume, deep
NN3	nonthermal, basin-shaped, atypical volume, shallow
NN4	nonthermal, basin-shaped, atypical volume, deep
TB1	thermal, bell-shaped, typical volume, shallow
TB2	thermal, bell-shaped, typical volume, deep
TB3	thermal, bell-shaped, atypical volume, shallow
TB4	thermal, bell-shaped, atypical volume, deep
TN1	thermal, basin-shaped, typical volume, shallow
TN2	thermal, basin-shaped, typical volume, deep
TN3	thermal, basin-shaped, atypical volume, shallow
TN4	thermal, basin-shaped, atypical volume, deep

Table 74. Pit-Classification Frequencies at Falcon Landing

Pit-Classification Code	TB	NB	TN	NN	Total
1	7	11	222	951	1,191
2	—	2	20	52	74
3	2	2	24	74	102
4	—	—	4	7	11
Total	9	15	270	1,084	1,378

Thus, these four attributes can be combined to create 16 mutually exclusive pit classifications based on evidence of in situ burning, cross-sectional shape, size typicality, and shallowness. Table 73 shows these 16 classifications, and Table 74 shows the number of pits in each.

Pit-Feature Descriptions

The above analysis served to classify and describe the hundreds of extramural-pit features at Falcon Landing. Clearly, describing each of these pits in the manner presented for pits at the other sites discussed in this report is not possible. By applying a strict set of criteria to ensure data integrity, a sample set of 1,378 extramural pits was selected for analysis based on categorical field observations and mathematical size and shape calculations. These observations and calculations placed each pit into one of 16 mutually exclusive groups, each with a unique set of attributes. It is from these 16 types that we select pits for description, based on characteristics representative of each type as well as characteristics that set pits apart from others. Below are descriptions of 23 extramural-pit features from Falcon Landing. In these descriptions, the 16 pit classifications are represented (with the exception of TB2, TB4, and NB4, for which there were no examples).

Early to Late Archaic Period Component

Feature 1329

Feature type: nonthermal pit (NN3)
Age: Early to Middle Archaic period
Locus: Area B
Grid location: D1
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: irregular
Length (m): 1.60
Width (m): 1.20
Excavated depth (m): 0.19
Volume (m^3): 0.170

Excavation Methods

Feature 1329 was an extramural nonthermal pit in the southeastern corner of Area B (see Appendix A). In comparison to other nonthermal non-bell-shaped pits, Feature 1329 had an atypically large volume (NN3) (see Table 73). The pit first appeared as a darker stain in MSU 1281. The feature was bisected and excavated in two sections (SECs 1994 and 5520), and each half was removed by hand in a single level. The fill was screened through 1/4-inch mesh, and flotation and pollen samples were removed from each section. The excavators then drafted a plan view and cross section of the feature (Figure 155) and took digital photographs (Figure 156).

Feature Fill

The pit contained a single stratum of soft, dark yellowish brown silt loam with sparse inclusions of fine and medium sand. Some carbonate nodules were developing. No charcoal was seen in the fill. Rodent and insect disturbance was noted, and a rodent tunnel was visible in the base of the pit. Artifacts recovered from the feature included 3 unworked faunal bone specimens, 18 pieces of lithic debitage, and 4 FAR.

Chronometric Data

<u>**Diagnostic Material Culture**</u>

None.

<u>**Geochronologic Analysis**</u>

Feature 1329 originated at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Early to Late Archaic period.

<u>**Radiocarbon Analysis**</u>

None.

Abandonment Processes

The pit appeared to have been filled by natural processes; no lamination was noted in the sediment, but it may have been obscured by the disturbances seen in the fill.

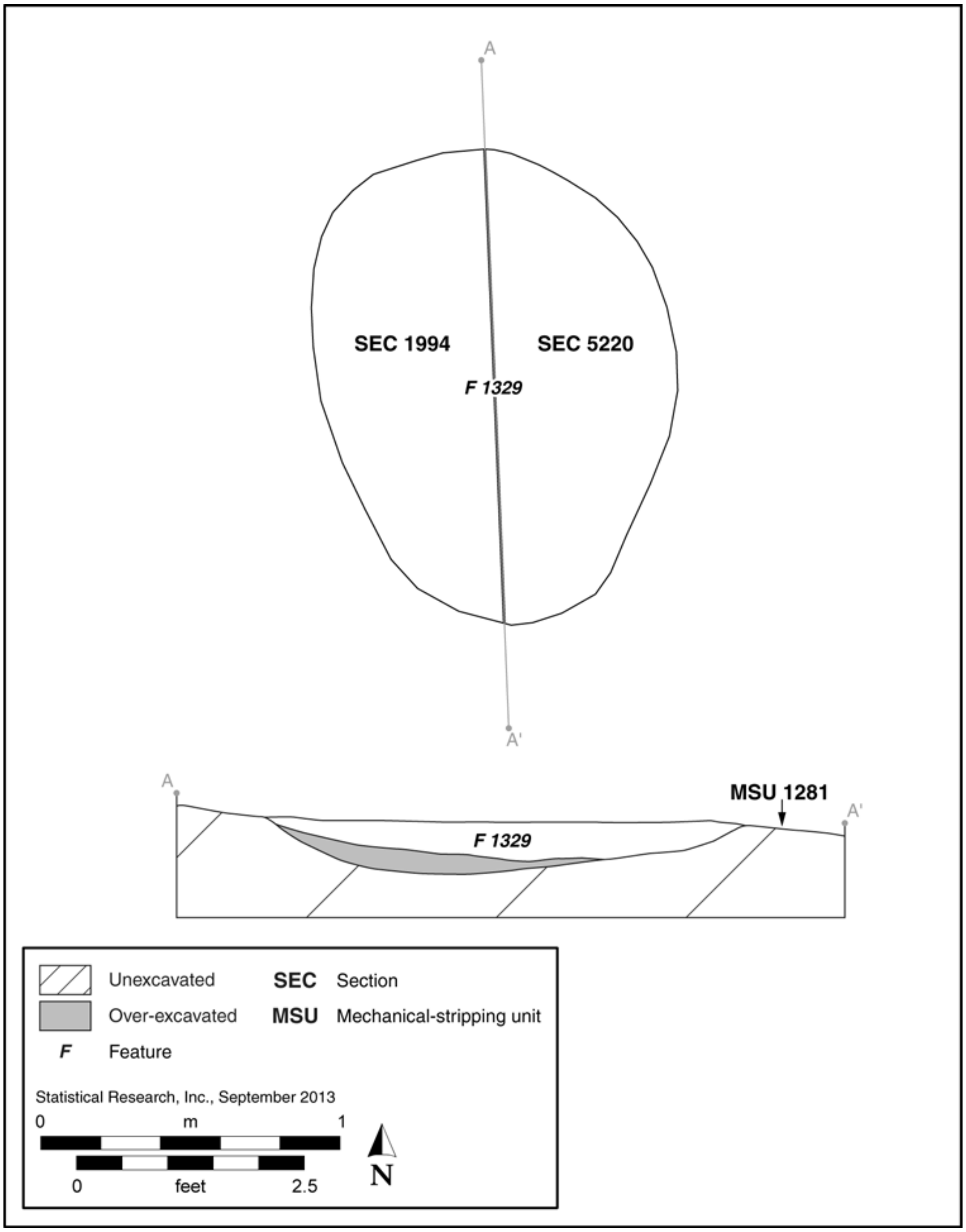

Figure 155. Mid-excavation plan view and cross section of Feature 1329 (a shallow, nonthermal, non-bell-shaped pit of atypical volume [NN3]) at Falcon Landing.

Figure 156. Post-excavation photograph of Feature 1329 (a shallow, nonthermal, non-bell-shaped pit of atypical volume [NN3]) at Falcon Landing, view to the east.

Stratigraphic Relationships and Associated Features

Feature 1329 was present at the surface of Unit I, suggesting that it was occupied sometime during the Early to Late Archaic period. Eighteen features within in a 10-m radius of Feature 1329 shared the same stratigraphic position (see Appendix A), including house-in-pit Feature 1313, located 5.6 m to the south. Most of the pit features in the vicinity were nonthermal; these included Features 1305, 1306, 1307, 1312, 1334, 1475, 1477, 1478, 1490, 1525, 1536, 1545, and 8896. Two thermal pits (Features 1311 and 1481) and two charcoal/ash lenses (Features 1308 and 1476) were also nearby. Two of the pits were radiocarbon dated; Feature 1307 dated to the San Pedro phase of the Late Archaic period, and Feature 1334 dated to the Chiricahua phase of the Middle Archaic period.

Two features adjacent to Feature 1329 were located in a different stratigraphic horizon (Unit II) and appeared to be from a later period of occupation: activity-surface Feature 1239, 10 m to the southeast, and nonthermal-pit Feature 1336, 6.2 m to the northwest. Stratigraphic Unit II dates to the Late Archaic period.

Feature 3570

Feature type: nonthermal pit (NB1)
Age: Early to Late Archaic period
Locus: Area B
Grid location: B4
Level of effort: partial
Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 0.49
Width (m): 0.45
Excavated depth (m): 0.31
Volume (m³): 0.040

Excavation Methods

Feature 3570 was an extramural nonthermal bell-shaped pit located in the southern portion of Area B (see Appendix A). The feature represents a shallow, nonthermal bell-shaped pit with a typical volume (NB1) (see Table 73). It was first identified in plan view during mechanical stripping of MSU 3522. An unknown quantity of the upper portion of the pit was removed by mechanical stripping. Hand-excavation proceeded with the removal of the southern half of the pit in a single level (SEC 6229). Pollen and flotation samples were removed, and the fill was screened through 1/4-inch mesh. The excavators took digital photographs and drew a plan view and cross section after excavation of the section was complete (Figures 157 and 158).

Feature Fill

The pit contained a single stratum of soft, dark yellowish brown silt loam with numerous charcoal flecks and pieces of oxidized soil. No other cultural material was noted, and no disturbances were observed in the fill.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 3570 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Early to Late Archaic period.

Radiocarbon Analysis

None.

Figure 157. Photograph of Feature 3570 (a shallow, nonthermal, bell-shaped pit of typical volume [NB1]) at Falcon Landing, view to the north.

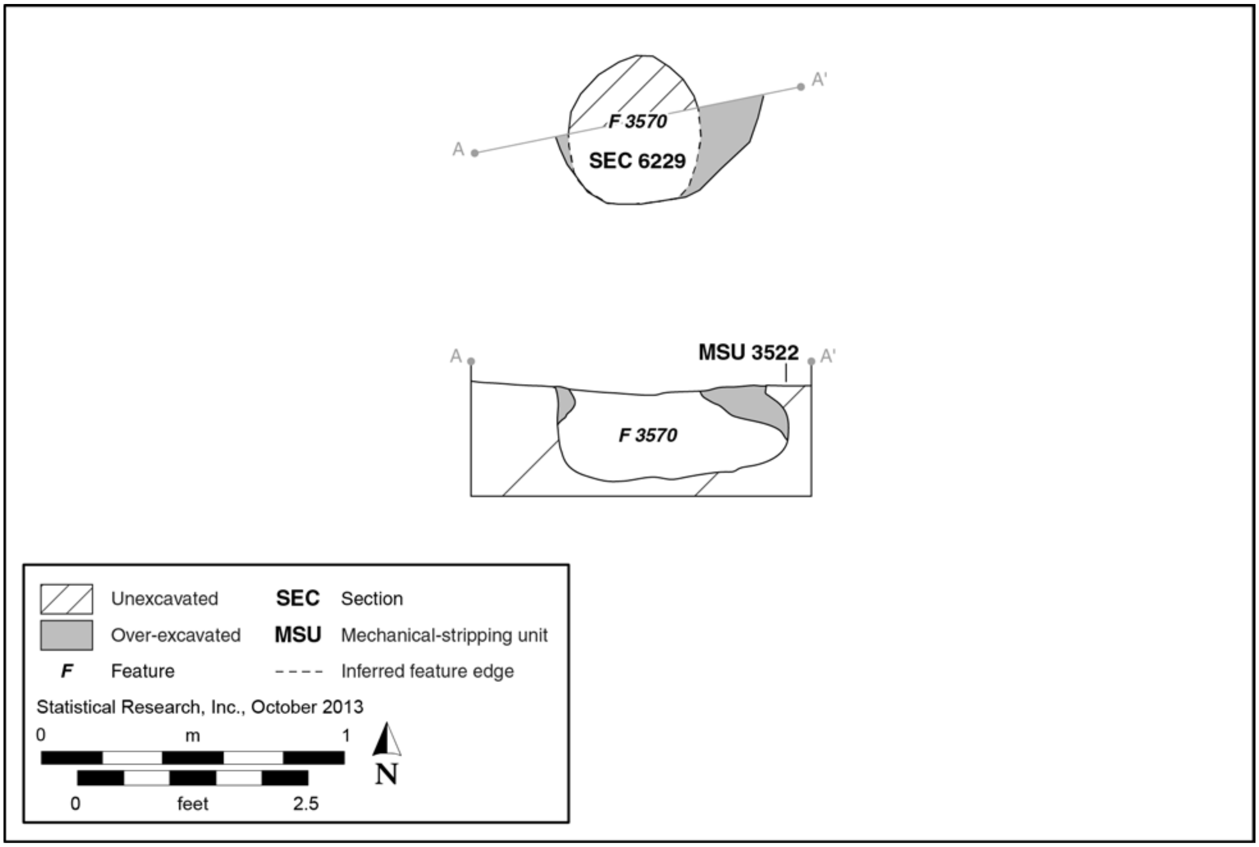

Figure 158. Mid-excavation plan view and cross section of Feature 3570 (a shallow, nonthermal, bell-shaped pit of typical volume [NB1]) at Falcon Landing.

Abandonment Processes

Feature 3570 appears to have been a storage pit that was intentionally filled with burned material sometime during the occupation of the site. Lack of oxidation on the pit margins indicates that in situ burning did not occur in the feature. The pit fill may have been refuse from a thermal feature.

Stratigraphic Relationships and Associated Features

Feature 3570 originated on the surface of Unit I, underlying Unit III2. The age of this stratigraphic position corresponds to the Early to Late Archaic period. Six nonthermal pits were within a 10-m radius of Feature 3570 (see Appendix A). Of these, three originated in the same stratigraphic position as Feature 3570 and were potentially from the same episode of site use: Features 1543, 3555, and 3574. The other three pits (Features 3526, 3527, and 3567) were in Unit III2 and dated to the Late Archaic period.

Feature 3586

Feature type: nonthermal pit (NB3)
Age: Early to Late Archaic period
Locus: Area B
Grid location: B4
Level of effort: partial
Plan-view shape: ovate
Cross-sectional shape: bell
Length (m): 2.48
Width (m): 1.06
Excavated depth (m): 0.53
Volume (m³): 0.730

Excavation Methods

Feature 3586 was an extramural nonthermal pit in the southern portion of Area B (see Appendix A). The pit represents a shallow nonthermal bell-shaped pit with an atypically large volume (NB3) (see Table 73).

It was first identified during the excavation of MSU 3522, appearing as a charcoal-stained oval on the stripping surface. Mechanical excavation had disturbed and removed an unknown upper portion of the feature. The southern half of the pit (SEC 5905) was removed by hand in two levels and screened through 1/4-inch mesh. Flotation samples were obtained from both levels, and a pollen sample was scraped from the base of the pit. Upon completion of this section, the excavator drew a scaled plan view and cross section and took digital photographs (Figures 159 and 160).

Feature Fill

The pit fill was a single stratum of loose, light yellowish brown sandy loam with visible laminates. Charcoal fragments were included throughout the fill but were most abundant in the upper 20 cm. Disturbances consisted of insect and rodent tunnels and a small number of plant roots. Artifacts recovered included five pieces of unworked faunal bone and eight pieces of lithic debitage.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 3586 was located on the Unit I surface, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Early to Late Archaic period.

Radiocarbon Analysis

No samples were submitted for analysis.

Figure 159. Mid-excavation photograph of Feature 3586 (a shallow, nonthermal, bell-shaped pit of atypical volume [NB3]) at Falcon Landing, view to the north.

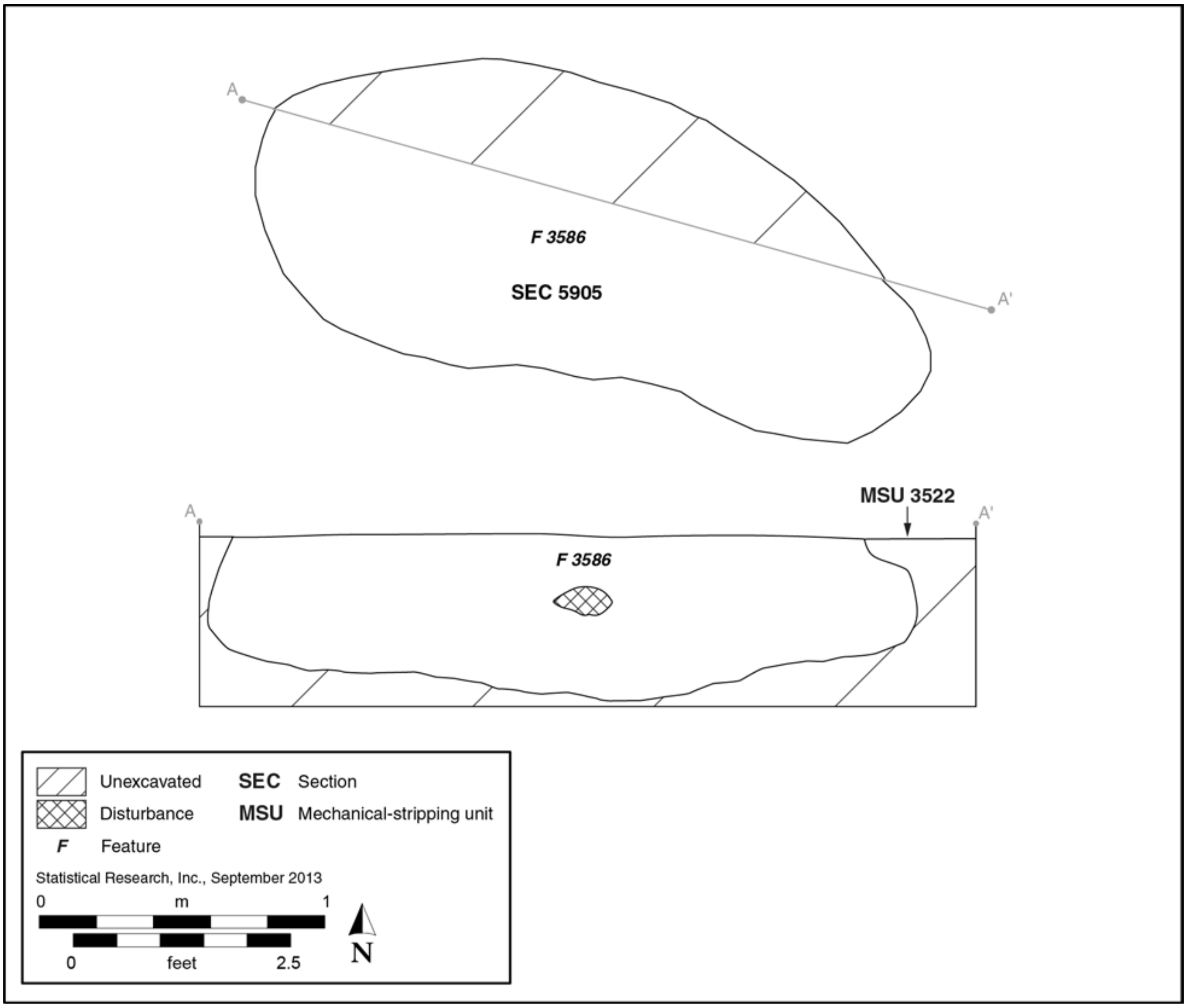

Figure 160. Mid-excavation plan view and cross section of Feature 3586 (a shallow, nonthermal, bell-shaped pit of atypical volume [NB3]) at Falcon Landing.

Abandonment Processes

The feature appears to have been filled by natural processes, probably aeolian and alluvial deposition, as indicated by the laminae in the fill. Charcoal in the upper fill of the pit may have been intentionally deposited refuse or incidental burned material that washed in from other activities on the site.

Stratigraphic Relationships and Associated Features

The stratigraphic position of Feature 3586 indicates that it was in use sometime during the Early to Late Archaic period. The nearest features in the same stratigraphic unit were two nonthermal pits to the south, Features 3592 and 3593 (see Appendix A). Others within a 10-m radius included a cache (Feature 3598) and eight nonthermal pits (Features 3577, 3578, 3584, 3591, 3619, 5963, 6387, and 8306). An FAR concentration, Feature 3581, was 7 m to the northeast. The only feature in a different stratigraphic horizon was Feature 3612, a nonthermal pit in Unit III1/Unit III2. Because this horizon dates to the Middle to Late Archaic period, the feature could potentially be from the same occupational episode as Feature 3586.

Feature 3593

Feature type: nonthermal pit (NN3)
Age: Early to Late Archaic period
Locus: Area B
Grid location: B4
Level of effort: partial
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 1.72
Width (m): 1.62
Excavated depth (m): 0.50
Volume (m³): 0.830

Excavation Methods

Feature 3593 was an extramural nonthermal pit identified during the excavation of MSU 3522, in the southern portion of Area B (see Appendix A). The pit's volume was much larger than other nonthermal non-bell-shaped pits on the site (NN3) (see Table 73). The feature first appeared on the stripping surface as a circular area with fewer carbonate and gravel inclusions than the surrounding matrix. The pit was bisected, and the southern half (SEC 5982) was removed in a single level and screened through 1/4-inch hardware cloth. A flotation sample was removed from the fill, and a pollen sample was scraped from the base of the pit. The northern part of the feature was not excavated. Excavators drafted a plan view and cross section and took digital photographs (Figures 161 and 162).

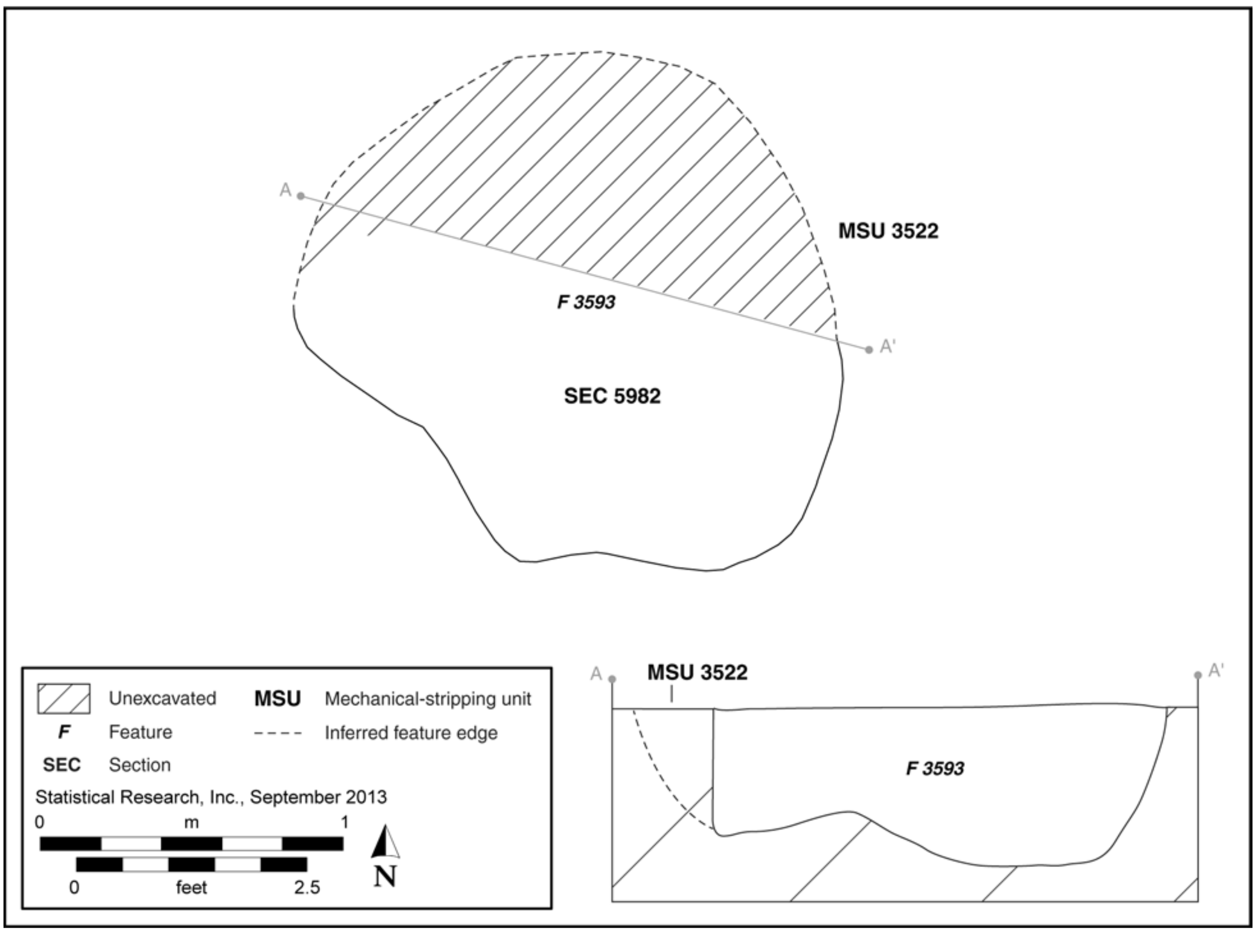

Figure 161. Mid-excavation plan view and cross section of Feature 3593 (a shallow, nonthermal, non-bell-shaped pit of atypical volume [NN3]) at Falcon Landing.

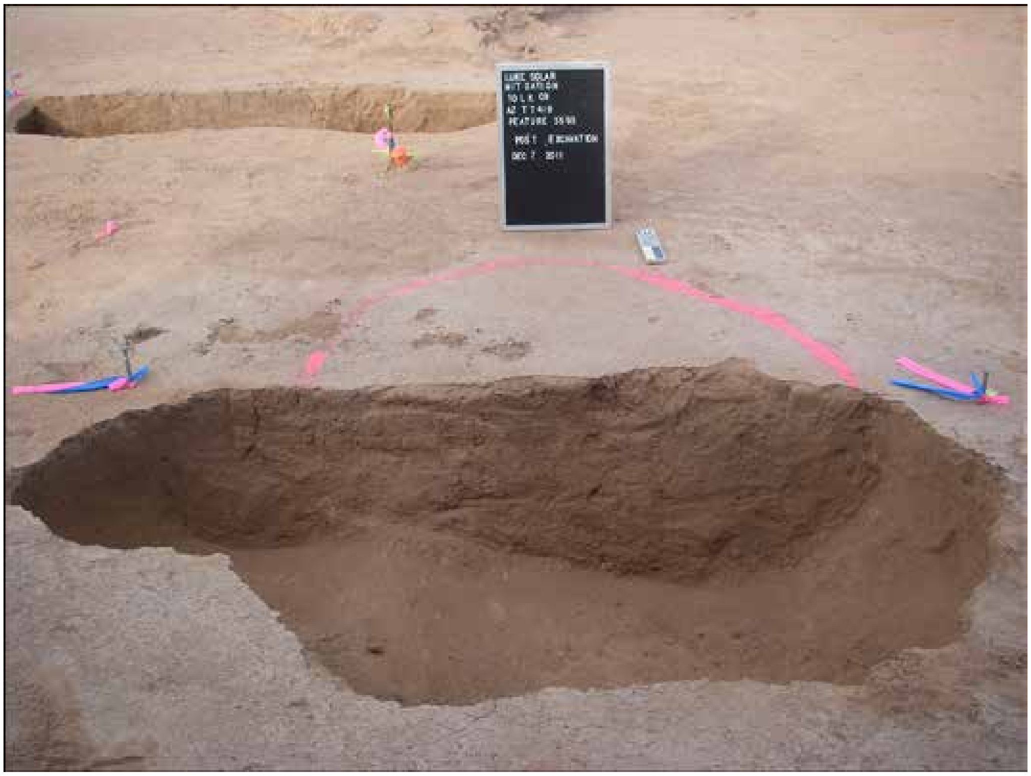

Figure 162. Mid-excavation photograph of Feature 3593 (a shallow, nonthermal, non-bell-shaped pit of atypical volume [NN3]) at Falcon Landing, view to the north.

Feature Fill
The pit contained a loose, yellowish brown silt loam with a few inclusions of fine gravel. A minimal amount of charcoal flecking was present, and three pieces of flaked stone debitage were the only artifacts. Some insect disturbance was noted; mechanical stripping also removed an unknown quantity of the upper portion of the pit.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 3593 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Early to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The fill of Feature 3593 appeared to be a mix of aeolian and possibly low-energy alluvial deposits. This suggests that the feature fell into disuse and was filled by natural processes. The few artifacts and charcoal pieces suggest that the natural sediments transported cultural material from other areas of the site.

Stratigraphic Relationships and Associated Features
Based on its stratigraphic position, Feature 3593 dated to the Early to Late Archaic period. It was in close proximity to a number of surrounding pits and features. Nineteen features within a 10-m radius of Feature 3593

were located in the same stratigraphic horizon (see Appendix A). A single nonthermal pit, Feature 3612, originated in Unit III1/Unit III2 and dated to the Middle to Late Archaic period.

Chiricahua Phase Component

Feature 4235

Feature type: nonthermal pit (NN4)
Age: Chiricahua phase
Locus: Area B
Grid location: B4
Level of effort: complete
Plan-view shape: indeterminate
Cross-sectional shape: basin
Length (m): 0.58
Width (m): unknown
Excavated depth (m): 0.96
Volume (m^3): 0.540

Excavation Methods

Feature 4235 was an extramural nonthermal pit in the south-central portion of Area B (see Appendix A). The pit had an atypically large volume in comparison to other nonthermal non-bell-shaped pits on the site (NN4) (see Table 73). First identified in TR 4205 during Phase 1 testing, the pit appeared in profile as a basin-shaped lens with charcoal, ash, flaked stone, and faunal bone. The trench truncated approximately half of the feature. A macrobotanical sample was collected from the feature profile and sent for species identification (see Chapter 6, Volume 2) and subsequent radiocarbon analysis (see the Radiocarbon Analysis section, below). A profile drawing of the feature was drafted, and photographs were taken. The pit was later exposed in plan view during the excavation of MSU 4269 (Figure 163). The remaining pit fill was hand-excavated in a single unit (SEC 2933) and level, and the fill was screened through 1/4-inch mesh after pollen and flotation samples had been collected. Upon completion of excavation, the excavator drew a scaled plan map and cross section and took digital photographs (Figure 164).

Feature Fill

The pit contained a hard, yellowish brown sandy loam with inclusions of silt, fine sands, and a small amount of subrounded, coarse gravel. Charcoal inclusions were most abundant in the upper 10 cm and decreased with depth. Insect casts were the only disturbances noted. In total, 270 faunal-bone specimens were recovered from the pit.

Chronometric Data

<u>**Diagnostic Material Culture**</u>
None.

<u>**Geochronologic Analysis**</u>
Feature 4235 was located at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III1) overlying it. The unconformity between the Unit I surface and Unit III1 provides a geochronologic date of ca. 5320–1380 cal. B.C. (see Chapter 2, Volume 2).

<u>**Radiocarbon Analysis**</u>
A piece of mesquite wood (*Prosopis* sp.) was submitted to Aeon for AMS dating. It returned a 2σ calibrated range of 3340–3090 cal. B.C. (Aeon Sample No. 676). This date range corresponds to the Chiricahua phase of the Middle Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

The presence of charcoal in the upper fill and the lack of oxidation on the pit walls suggest that the pit contained intentionally deposited refuse. The material in the pit was likely a secondary deposit from a thermal feature. Most of the bone was blackened and/or calcined. The pit fill appeared to be a very concentrated

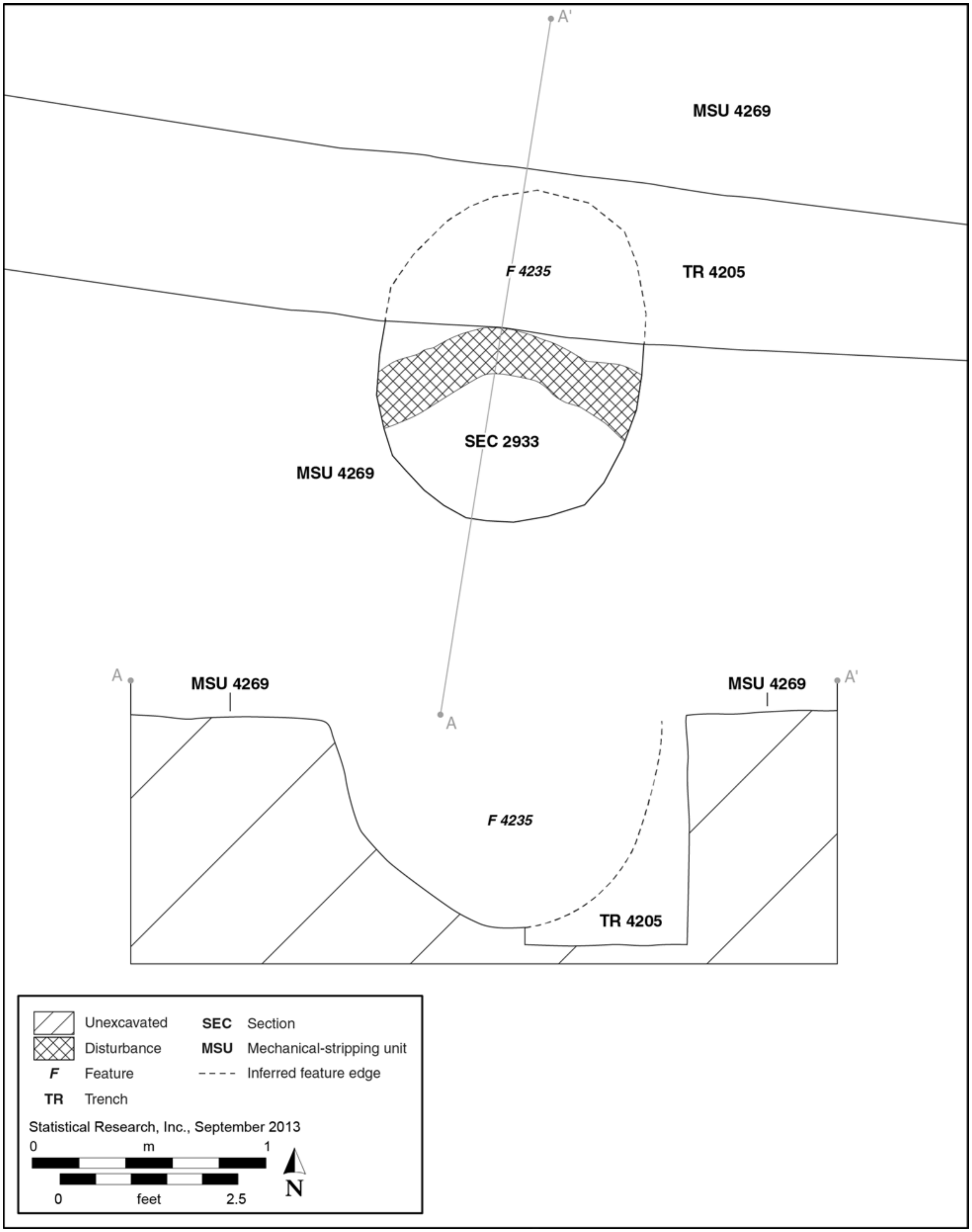

Figure 163. Post-excavation plan view and cross section of Feature 4235 (a deep, nonthermal, non-bell-shaped pit of atypical volume [NN4]) at Falcon Landing.

Figure 164. Post-excavation photograph of Feature 4235 (a deep, nonthermal, non-bell-shaped pit of atypical volume [NN4]) at Falcon Landing, view to the south.

deposit of cooking refuse and fuel wood. The remainder of the pit was likely filled through natural aeolian and alluvial processes.

Stratigraphic Relationships and Associated Features

The stratigraphic position of Feature 4235 at the Unit I surface suggests that it was constructed sometime during the Early to Middle Archaic period. This is supported by the Chiricahua phase radiocarbon date. Only one other feature in the immediate area was located in this stratigraphic unit: Feature 1563, a nonthermal pit located 3.3 m to the southwest (see Appendix A).

Other pits within a 10-m radius were located in Unit III1. They dated to the Middle to Late Archaic period (ca. 1380–920 cal B.C.) and therefore postdate Feature 4235. These included four nonthermal pits (Features 4276, 4280, 4336, and 4337) and one thermal pit (Feature 4338).

Feature 15317

Feature type: thermal pit (TN4)
Age: Chiricahua phase
Locus: Area B
Grid location: F0
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: conical
Length (m): 0.9
Width (m): 0.76
Excavated depth (m): 0.7
Volume (m^3): 0.607

Excavation Methods

Feature 15317 was an extramural thermal basin-shaped pit in the northwestern portion of Area B (see Appendix A). In comparison to other thermal non-bell-shaped pits, Feature 15317 was deep and had an atypical volume (TN4) (see Table 73). The pit first appeared as a darker stain in MSU 15249. The feature was bisected, and the northern half of the pit was excavated with one section (SEC 13820) and was partially overexcavated. The southern half of the pit was then excavated as SEC 17435 in one arbitrary level. The fill from both sections was 1/4-inch screened, and flotation and C14 samples were collected from the fill. Charred plant material obtained from the flotation sample was submitted for further analysis (see Chapter 6, Volume 2). During the excavation of SEC 17435, an upside-down metate (PD 15427) was uncovered. A pollen sample was collected from beneath the metate, and a pollen control sample was scraped from the fill adjacent to the metate. In addition, a mano (PD 13817) was uncovered above the metate. During the excavation of SEC 13820, a second upside-down metate (PD 17847) was uncovered, and a pollen sample was collected from beneath this second metate. A pollen wash collected from the first metate (PD 15427) was submitted for further analysis (see Chapter 7, Volume 2). The excavator then drafted a plan view and cross section of the feature (Figure 165) and took digital photographs (Figure 166).

Feature Fill

The pit contained a single stratum of reddish brown silt loam with abundant ash and charcoal throughout the fill. Oxidation was present at the base of the pit. Artifacts recovered from the pit include two complete metates (PDs 15427 and 17847), a Lukeolith fragment (for a definition of 'Lukeoliths,' see Chapter 3, Volume 2), a complete mano, 24 pieces of flaked stone debitage, 2 pieces of unworked faunal bone, and a single piece of FAR.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 15317 originated at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit I surface and Unit IV provides a geochronologic date of ca. 5320 cal B.C.–cal A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

Two charred horse-purslane (*Trianthema portulacastrum*) seeds were recovered from the fill of the pit and submitted to Aeon for AMS dating. The seeds returned a 2σ calibrated date range of ca. 3340–3030 cal B.C. (Aeon Sample No. 1525) (see Chapter 2, Volume 2). This date corresponds to the Chiricahua phase.

Abandonment Processes

The pit appeared to have been intentionally filled. The presence of two complete upside-down metates and a mano suggest the pit was used to cache ground stone tools for later reuse (see Chapter 3, Volume 2). The presence of charcoal and ash throughout the fill also suggests the pit was used to dispose of burned materials. Oxidation at the base of the pit indicates the primary function of the pit may have been for heating or cooking. No wind or waterlain deposits were recognized, indicating the pit was not filled by natural processes.

Stratigraphic Relationships and Associated Features

Feature 15317 was located within a dense cluster of extramural pits (see Appendix A). These pits were all located at the surface of Unit I, with Unit IV sediments overlying it, providing a geologic date of Early Archaic to Pioneer period. A total of 20 nonthermal pits were present within 10 m of Feature 15317, including Features 15306, 15307, 15308, 15309, 15310, 15311, 15312, 15313, 15314, 15315, 15316, 15334, 15335, 15336, 15337, 15338, 15339, 15340, 15341, and 15342. A single nonthermal pit to the north of Feature 15317 had a radiocarbon date of 2870–2620 cal B.C., placing it in the Chiricahua phase.

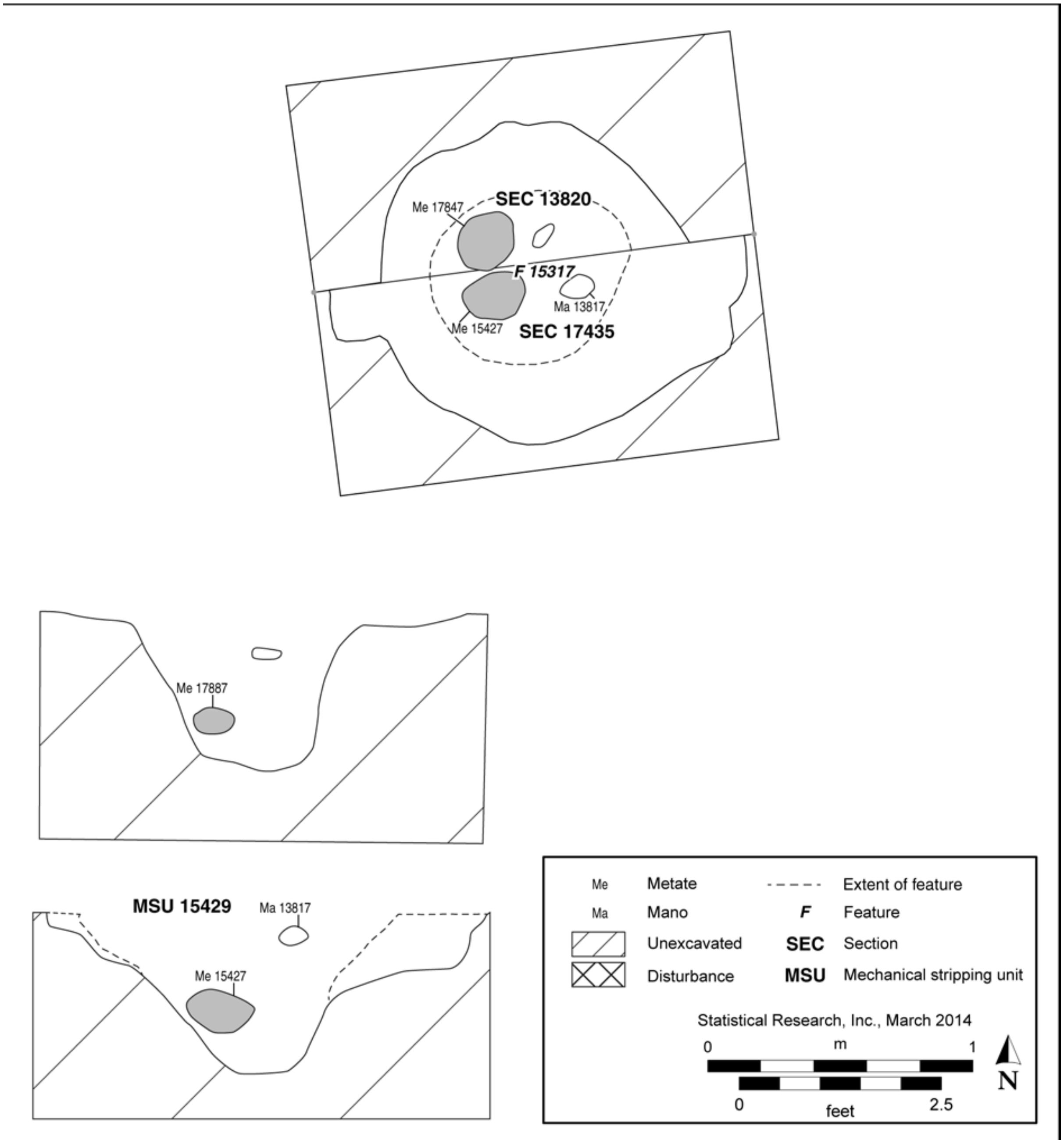

Figure 165. Plan view and cross section of Feature 15317 (a deep, thermal, non-bell-shaped pit of atypical volume [TN4]) at Falcon Landing.

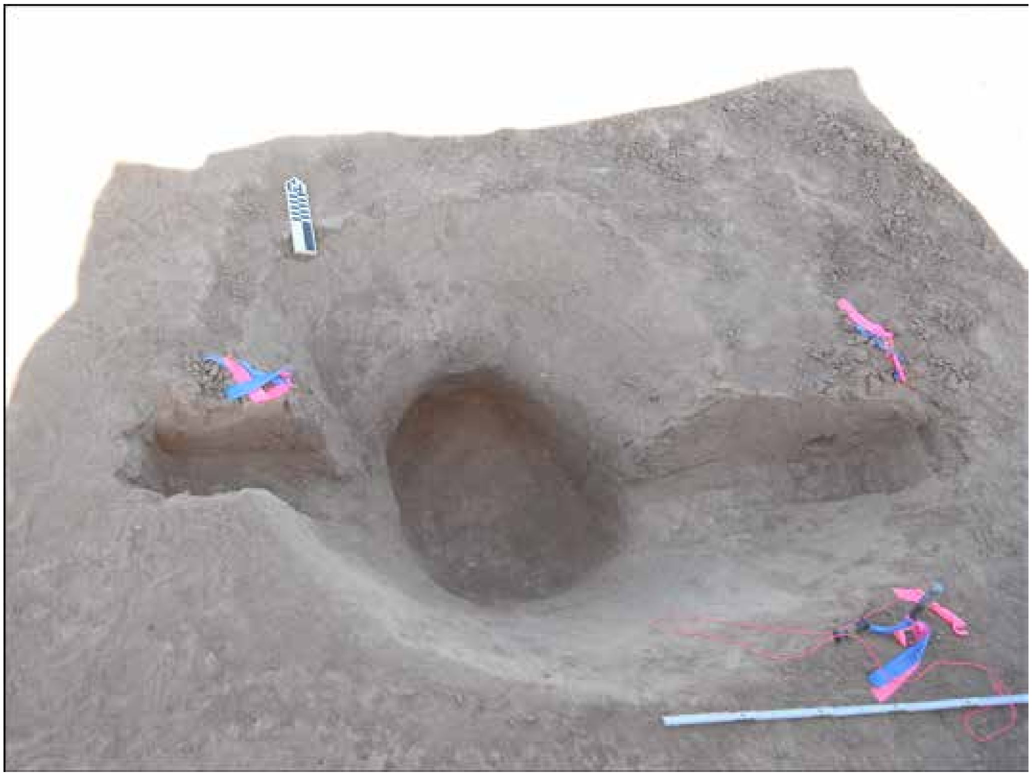

Figure 166. Post-excavation photograph of Feature 15317 (a deep, thermal, non-bell-shaped pit of atypical volume [TN4]) at Falcon Landing.

Middle to Late Archaic Period Component

Feature 4295

Feature type: thermal pit (TB1)
Age: Middle to Late Archaic period
Locus: Area B
Grid location: D2
Level of effort: full
Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 0.94
Width (m): 0.85
Excavated depth (m): 0.56
Volume (m^3): 0.230

Excavation Methods

Feature 4295 was an extramural thermal bell-shaped pit identified during the excavation of MSU 4268 in the southwestern portion of Area B (see Appendix A). The feature represents a shallow, thermal bell-shaped pit with typical volume (TB1) (see Table 73).

The pit was first identified in plan view as a charcoal-stained circle with an oxidized outline. Mechanical exposure had disturbed and removed an unknown amount of the upper portion of the feature. The pit was bisected, and each section (SECs 5290 and 5305) was hand-excavated in a single level and screened through 1/4-inch hardware cloth. Flotation and pollen samples were collected from the fill of each section. The excavator drew a scaled plan map and cross section and took digital photographs (Figures 167 and 168).

Feature Fill

The pit contained a single stratum of loosely compact, brown sandy loam. A moderate amount of charcoal and a small quantity of subangular gravels were included in the fill. The base of the pit consisted of a 5–7-cm layer of highly oxidized soil containing ash and charcoal. Large pieces of charcoal also rested on that surface. A small amount of animal and insect bioturbation was noted. Artifacts in the fill included eight pieces of unworked faunal bone, eight pieces of lithic debitage, and two pieces of FAR.

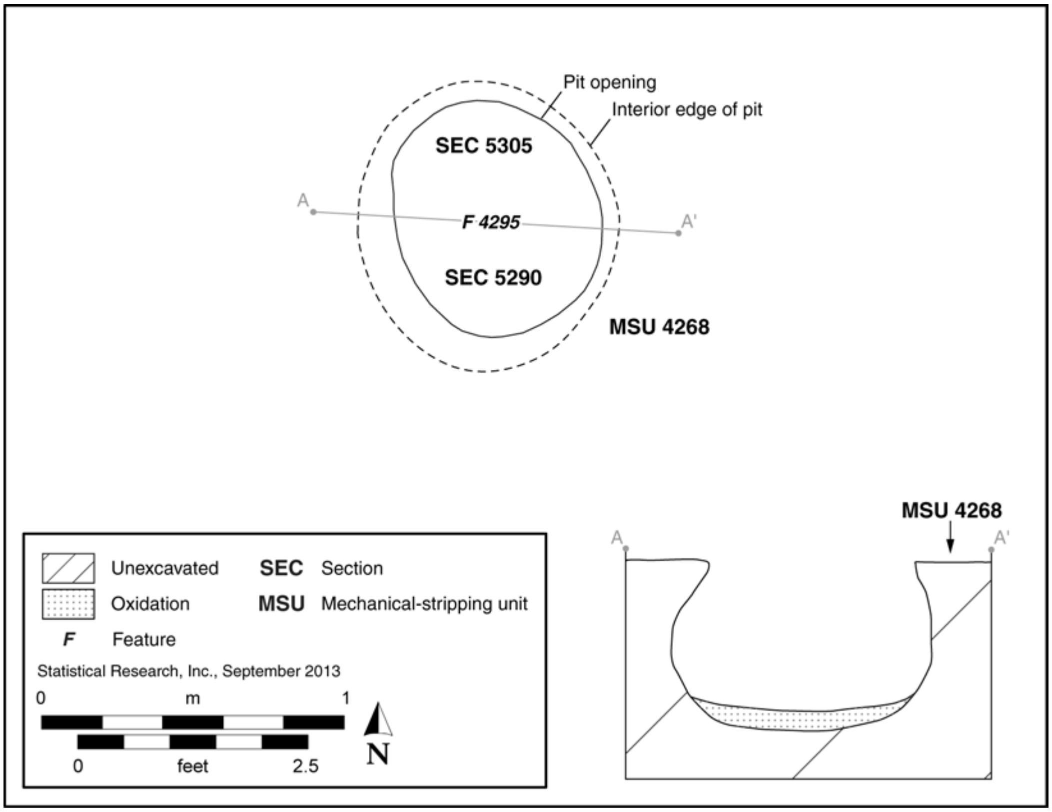

Figure 167. Post-excavation plan view and cross section of Feature 4295 (a shallow, thermal, bell-shaped pit of typical volume [TB1]) at Falcon Landing.

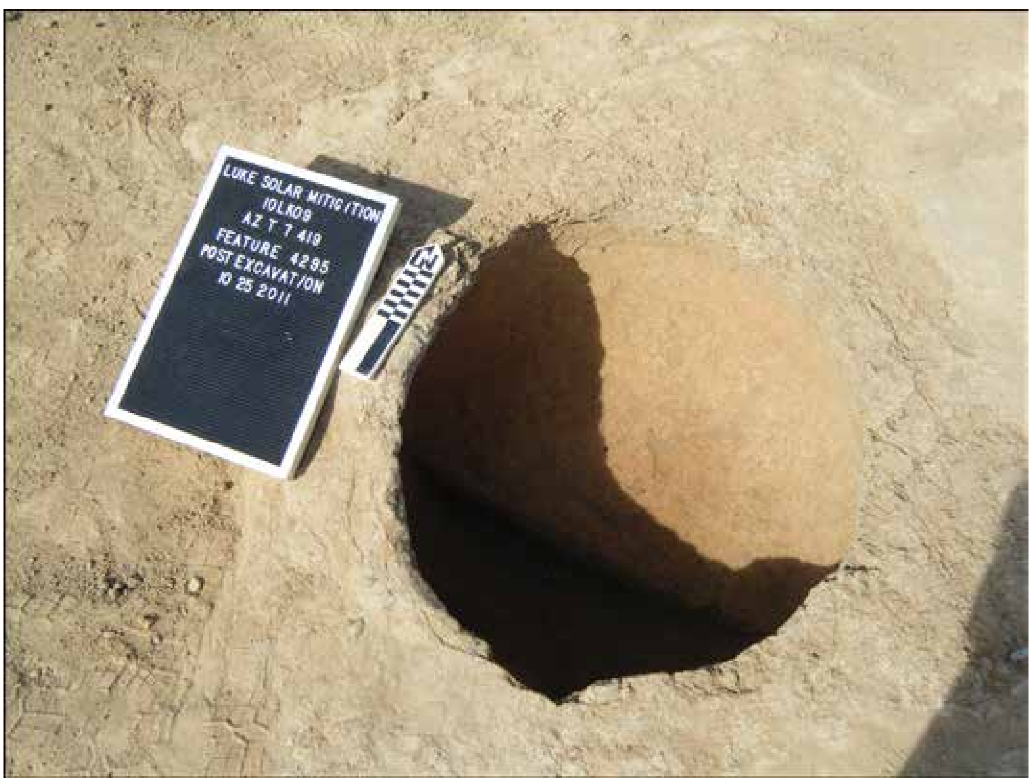

Figure 168. Post-excavation photograph of Feature 4295 (a shallow, thermal, bell-shaped pit of typical volume [TB1]) at Falcon Landing, view from above.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 4295 originated within Unit III1, which has a bracketing age range of ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis
No samples were submitted for analysis.

Abandonment Processes
The feature appeared to have been abandoned with the remnants of its final use left in place. Pieces of charcoal at the base of the pit were probably fuel wood. The pit fill above that may have been purposely deposited in a single episode, as indicated by the homogeneous nature of the sediment. Alternatively, the upper pit fill was deposited by natural alluvial processes after the pit was abandoned. It is also possible that any stratigraphy from natural deposition was obscured by bioturbation.

Stratigraphic Relationships and Associated Features
Feature 4295 was located in Unit III1, which dates to the Middle to Late Archaic period. Five other pits in the same stratigraphic unit were in close proximity to Feature 4295 (see Appendix A) and may be contemporaneous. Feature 4297, a thermal pit, was 1.6 m to the southwest. Feature 4293 was a nonthermal pit 1.5 m to the northeast, Feature 4294 was a thermal pit 2.4 m to the north. Two additional nonthermal pits, Features 4292 and 1559, were 4.4 m and 2.7 m to the northeast, respectively.

Feature 4370
Feature type: nonthermal pit (NN1)
Age: Middle to Late Archaic period
Locus: Area B
Grid location: D2
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: irregular
Length (m): 1.15
Width (m): 0.81
Excavated depth (m): 0.20
Volume (m³): 0.092

Excavation Methods
Feature 4370 was first identified during mechanical stripping of MSU 4342, in the southwestern corner of the site (see Appendix A). Feature 4370 was classified as a shallow nonthermal non-bell-shaped pit with a typical volume (NN1) (see Table 73). It appeared as a large, irregularly shaped area of slightly darker sediment with visible flaked stone on its surface. It was originally thought to be a structure because of its relatively large size, and a flotation sample was removed from it in order to obtain a radiocarbon date. Hand-excavation then proceeded with the excavation of a 1-by-2-m test pit (TP 2872) within the apparent boundaries of the feature. After about 10 cm of overburden was removed, a pit edge was visible in the southwestern corner of the test pit. Most of feature was outside the test pit, although a large quantity of artifacts was recovered from the test pit. In order to uncover the remaining pit outline, HSU 2947 was established over the test pit. A 1-cm-thick level was shovel-scraped from the HSU, revealing the outline of Feature 4370. Sediment from the HSU was screened through 1/4-inch mesh.

The defined pit outline was then bisected and removed in two sections (SECs 2944 and 2949). The western half was excavated in three levels. Level 1 was an arbitrary 10 cm in depth, and Level 2 was terminated at the base of a flat-lying stone pipe (Figures 169 and 170). At that point, the eastern half was removed to that elevation in a single level, and Level 3 was excavated to the base of the pit as a single unit encompassing both halves of the feature. All fill was screened through 1/4-inch hardware cloth. Flotation and pollen

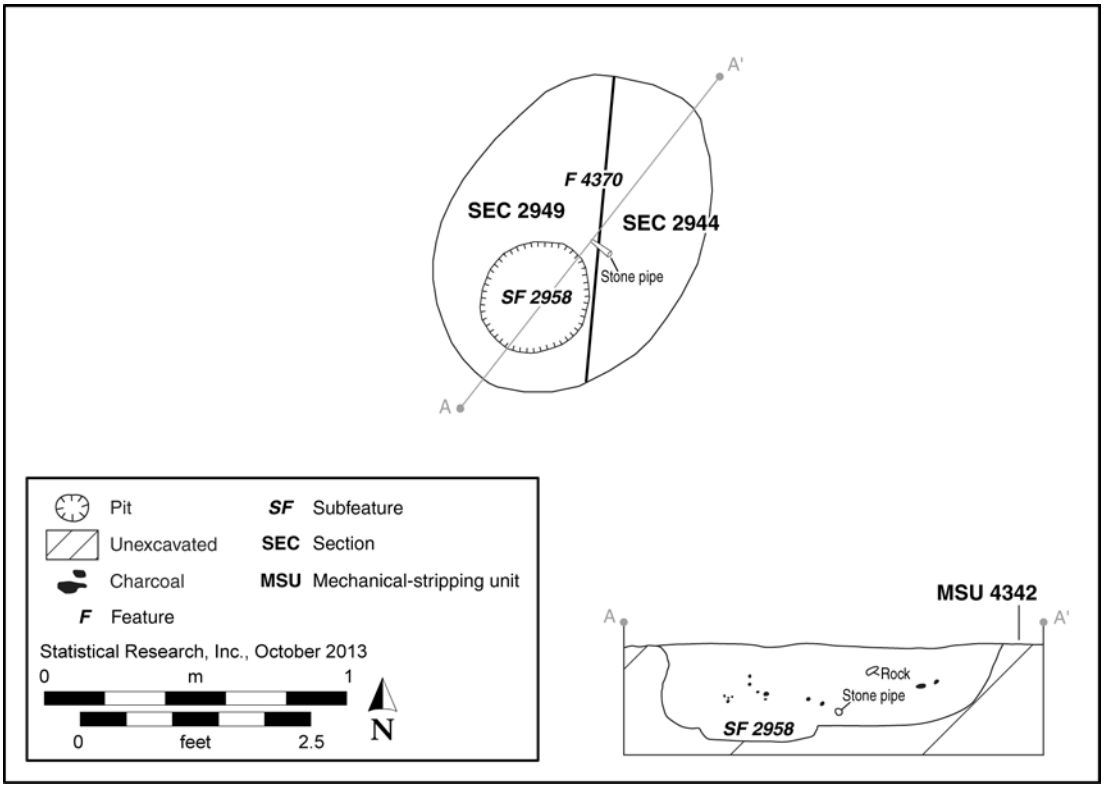

Figure 169. Post-excavation plan view and cross section of Feature 4370 (a shallow, nonthermal, non-bell-shaped pit of typical volume [NN1]) at Falcon Landing.

Figure 170. Mid-excavation photograph of Feature 4370 (a shallow, nonthermal, non-bell-shaped pit of typical volume [NN1]) showing a stone pipe at the base of pit.

samples were removed from Level 1 of both sections and from Level 2 of SEC 2949. A pollen sample was scraped from the base of the pit and sent for species identification (see Chapter 7, Volume 2).

A small pit was identified at the base of Feature 4370. Subfeature 2958 was a circular pit on the southern end of Feature 4370 (see Figure 169). The subfeature was shallow and basin shaped in cross section, measuring 0.39 by 0.36 m and 0.07 m in depth. It was excavated in a single level and screened through 1/4-inch mesh after a flotation sample and a pollen sample were removed.

Feature Fill

The pit contained a single stratum of yellowish brown, hard silty clay. Charcoal, ash, and small chunks of oxidized sediment were included in the fill. Artifacts recovered (not including those in the test pit and HSU, which were outside the feature boundary) were 70 pieces of faunal bone, 1 piece of FAR, 182 pieces of flaked stone debitage, 1 projectile point fragment, and 1 stone pipe. The stone pipe was located in the center of the pit, approximately 5 cm above the base. Disturbance was noted in the form of fine to medium-sized roots and a small animal burrow.

Subfeature 2958 contained a similar hard, massive, silty clay with inclusions of charcoal and ash. No artifacts were present.

Chronometric Data

Diagnostic Material Culture

The projectile point fragment could not be identified to type.

Geochronologic Analysis

Feature 4370 originated in Unit III1. The bracketing age range for this Unit is ca. 1380–920 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of burned mesquite (*Prosopis* sp.) wood was removed from the base of the pit and submitted to Aeon for AMS dating. The charcoal returned a 2σ calibrated date range of ca. 1380–1120 cal. B.C. (Aeon Sample No. 1496) (see Chapter 2, Volume 2). This date range corresponds to the Middle to Late Archaic period.

Abandonment Processes

It appears that the pipe was intentionally placed in the pit before it was filled. The feature contained a single stratum of sediment that could have been deposited in the pit after its use. The high number of artifacts in the fill of Feature 4370 as well as overlying the pit indicates that following the disuse of Feature 4370, the area was used as a refuse deposit, perhaps for refuse from other nearby activities.

Stratigraphic Relationships and Associated Features

Nearby features within 10 m of Feature 4370 included two structures and several extramural nonthermal pits, all potentially contemporaneous (see Appendix A). Feature 4349 was 2.7 m to the northwest and also dated to the Middle to Late Archaic period. A San Pedro phase house-in-pit, Feature 2967, was located 5.3 m to the southwest. Extramural features from the Early to Middle Archaic period included four nonthermal pits (Features 4347, 4350, 4353, and 4354) and two thermal pits (Features 2988 and 2989). Features from the Middle to Late Archaic period were all nonthermal pits and included Features 4234, 4346, and 4359. A single nonthermal pit, Feature 4343, was radiocarbon dated to the San Pedro phase.

Feature 10516

Feature type: nonthermal pit (NN1)
Age: Middle to Late Archaic period
Locus: Area A
Grid location: J4
Level of effort: partial
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.45
Width (m): 0.35
Excavated depth (m): 0.16
Volume (m³): 0.020

Excavation Methods

Feature 10516 was an extramural nonthermal pit in the northern portion of Area A (see Appendix A). It represents a typical shallow nonthermal non-bell-shaped pit, the most common category on the site (NN1) (see Table 73). It was first identified during the excavation of MSU 10512 as a charcoal-stained circle and was later difficult to discern, after the stripping surface had dried. The pit was bisected, and the southern half was excavated by hand in a single unit (SEC 13391) and level (Figure 171). The section was slightly over-excavated in order to define the limits of the feature. A flotation sample was collected from the fill, and a pollen sample was scraped from the base of the pit. The fill was not screened, and the northern part of the feature was not excavated. At the completion of SEC 13391, the excavator drew a scaled plan view and cross section and took digital photographs (Figure 172).

Feature Fill

The pit contained a medium gray silty clay loam with sparse charcoal flecks and a few pieces of charcoal that were up to 2 cm each in diameter. No artifacts were present.

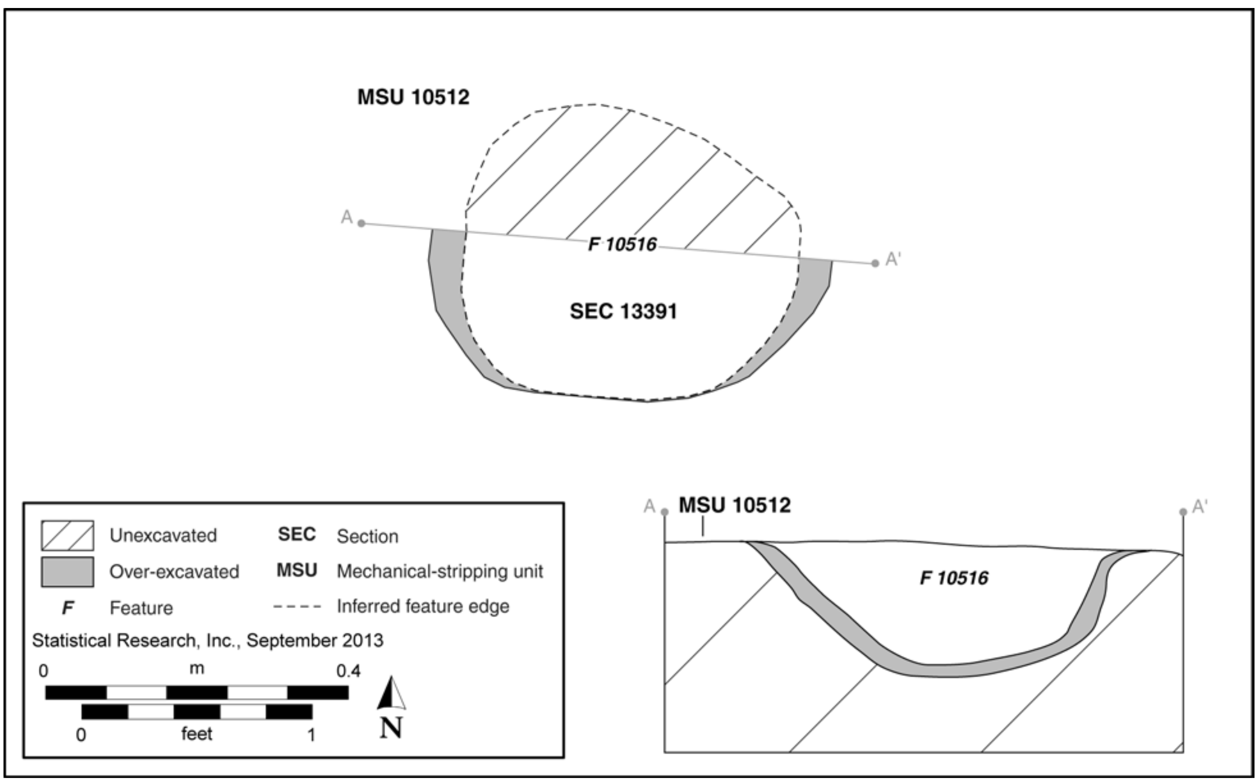

Figure 171. Mid-excavation plan view and cross section of Feature 10516 (a shallow, nonthermal, non-bell-shaped pit of typical volume [NN1]) at Falcon Landing.

Figure 172. Post-excavation photograph of Feature 10516 (a shallow, nonthermal, non-bell-shaped pit of typical volume [NN1]) at Falcon Landing, view to the north.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 10516 originated in Unit IIs/sf. The bracketing age range for Unit IIs/sf is ca. 2570–790 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

The pit fill may have been an ash deposit from a thermal feature or a surface fire. No lamination was present in the sediment, and it did not appear to have been filled by natural processes.

Stratigraphic Relationships and Associated Features

Stratigraphic Unit IIs/sf is associated with the Middle to Late Archaic period. The only pit within 10 m of Feature 10516 was a thermal pit, Feature 10514, located 10 m to the northwest (see Appendix A). It was radiocarbon dated to the Sedentary to Classic period, postdating Feature 10516.

Feature 15197

Feature type: thermal pit (TN2)
Age: Middle to Late Archaic Period
Locus: Area B
Grid location: F3
Level of effort: partial
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.56
Width (m): 0.43
Excavated depth (m): 0.35
Volume (m³): 0.050

Excavation Methods

Feature 15197 was an extramural thermal pit in the central portion of Area B (see Appendix A). The feature represents a deep nonthermal non-bell-shaped pit with a typical volume (TN2) (see Table 73). The pit was first identified during the excavation of MSU 15068. It appeared as a charcoal- and ash-laden circle on the stripping surface. The pit was divided in half, and the southern section was removed by hand in a single level (Figure 173). The fill was not screened, and flotation and pollen samples were collected.

Feature Fill

The pit contained a loose, light brown sandy loam with charcoal flecking and oxidized sediment. The pit margins had patchy oxidization. Artifacts collected from the feature included one piece of flaked stone debitage and four pieces of FAR.

Chronometric Data

Diagnostic Material Culture

None.

Figure 173. Photograph of Feature 15197 (a deep, thermal, non-bell-shaped pit of typical volume [TN2]) at Falcon Landing, view to the east.

Geochronologic Analysis

Feature 15197 originated in Unit IIs/sf. The bracketing date range for this unit is ca. 2570–790 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of burned mesquite wood (*Prosopis* sp.) was submitted to Aeon for AMS dating. The charcoal returned a 2σ calibrated date of 1380–1130 cal. B.C. (Aeon Sample No. 1522). This date range corresponds to the Middle to Late Archaic period (see Chapter 2, Volume 2).

Abandonment Processes

The fill of Feature 15197 may represent burned material from the last use of the pit. Alternatively, the fill may represent refuse that was intentionally deposited after the pit was cleaned out, after its last use. The oxidized walls of Feature 15197 suggest that the pit was used for cooking or heating.

Stratigraphic Relationships and Associated Features

Eighteen pits lay within a 10-m radius around Feature 15197 (see Appendix A). Of these, 6 (Features 15163, 15168, 15173, 15178, 15193, and 15194) also originated in Unit IIs/sf and were potentially contemporaneous. Twelve additional pits were located on the surface of Unit II s/f, overlain by Unit IV. These features dated to the Late Archaic to Pioneer period, overlapping with the date range of Feature 15197.

Feature 18880

Feature type: nonthermal pit (NN2)
Age: Middle to Late Archaic period
Locus: Area A
Grid location: I4
Level of effort: complete
Plan-view shape: indeterminate
Cross-sectional shape: indeterminate
Length (m): 0.70
Width (m): 0.70
Excavated depth (m): 0.60
Volume (m^3): 0.080

Excavation Methods

Feature 18880 was an extramural nonthermal pit on the surface of MSU 10588, in the central portion of Area A (see Appendix A). The feature is classified as a deep nonthermal non-bell-shaped pit with a typical volume (NN2) (see Table 73). The pit was unique in that it contained a large number of shell beads. It was first identified when shell beads were seen in an eroded area on the stripped surface (MSU 10588). HSU 18847, measuring 2 by 2 m, was placed over the beads and excavated in three 10-cm-deep levels, in an attempt to find a pit outline. The fill was screened through 1/8-inch mesh. At the base of Level 3, the beads were confined to a 0.7-m-diameter area, and a slight feature outline was apparent.

Although a slight pit outline was visible, the feature was more easily defined by the bead concentration (Figure 174). The concentration was then bisected and removed in two sections. The southern section (SEC 18904) was over-excavated in one level, in an attempt to identify the feature in profile and define the vertical limits of the beads (Figure 175). A pollen sample was removed from the fill of this section. A pit still could not be seen, but beads were visible in profile up to 0.25 m in depth (see Figure 174).

The northern half of the bead cluster (SEC 18905) was removed in four 10-cm-deep levels. Pollen samples were taken from below bead clusters in Levels 1, 2, and 3 (Figure 176). Flotation samples were removed from Levels 2–4. A macrobotanical sample was collected from Level 1 and submitted for species identification (see Chapter 6, Volume 2) and radiocarbon analysis (see the Chronometric Data section, below).

After the excavation of the bead cluster, three additional 10-cm-deep levels were removed from HSU 18847 to ensure that no other beads or artifacts were present in the area. Flotation samples were collected from each of these levels. A much lower density of artifacts was recovered from the lower HSU levels, and the final level contained only one piece of unworked faunal bone. The HSU was terminated at Level 6.

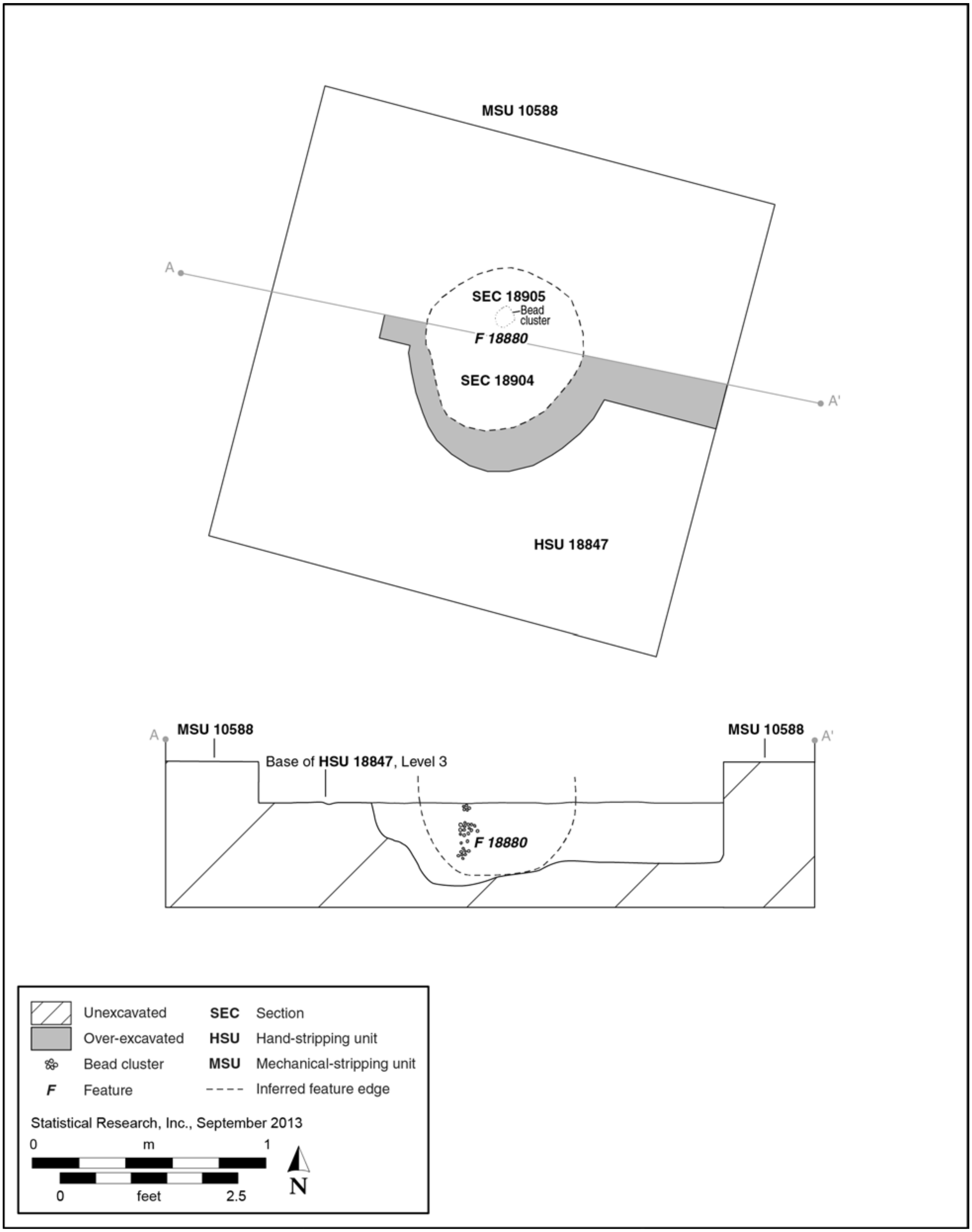

Figure 174. Mid-excavation plan view and cross section of Feature 18880 (a deep, nonthermal, non-bell-shaped pit of typical volume [NN2]) at Falcon Landing.

Figure 175. Post-excavation photograph of Feature 18880 at Falcon Landing, view to the north. The excavated basin represents the faint pit outline observed at the base of Level 3 in HSU 18847, and the lowest location in which beads were identified. Additional excavation took place following this photograph, but additional beads were not found.

Figure 176. Photograph of one of many *Olivella*-shell-bead clusters that composed Feature 18880 at Falcon Landing. A pollen sample was collected from beneath this cluster.

Feature Fill
The extent of the pit was primarily defined by the presence of shell beads, 238 of which were recovered from the feature and the surrounding matrix (see Chapter 4, Volume 2). In addition, 21 pieces of faunal bone, 2 pieces of worked bone, 7 pieces of unworked shell, 13 stone beads, and 7 pieces of lithic debitage were collected. Many of the beads were in small clusters (see Figure 176). The sediment in and around the beads consisted of a loosely compact, brown silt loam with a low density of charcoal. Animal and insect disturbance was also noted in the fill, and mechanical exposure may have removed an unknown amount of this feature.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 18880 originated within Unit IIs/sf. The bracketing date range for this unit is ca. 2570–790 cal. B.C., corresponding to the Middle to Late Archaic period (see Chapter 2, Volume 2).

Radiocarbon Analysis
A piece of burned saltbush (*Atriplex* sp.) was collected from Level 1 of SEC 18905 and submitted to Aeon for AMS dating. It returned a 2σ calibrated range of 1260–1040 cal. B.C. (Aeon Sample No. 1502) (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Abandonment Processes
Because a feature outline was difficult to define, it is uncertain whether the beads and artifacts were contained within a pit. Although the radiocarbon and geochronologic dates indicate that the feature dated to the Middle to Late Archaic period, the lack of an identifiable pit makes the beads' connection to these dates somewhat tenuous. If the beads were contained within a discrete pit, it was likely filled rapidly, making it difficult to distinguish from the surrounding natural alluvial sediments.

Stratigraphic Relationships and Associated Features
An activity area, Feature 10599, was 5.7 m to the northeast (see Appendix A). The activity area and three intrusive pits within it also originated in stratigraphic Unit IIs/sf and may have been contemporaneous with Feature 18880. Other features in the same geological horizon as Feature 18880 included a cluster of three nonthermal pits to the northeast (Features 10608, 10609, and 10610) and a nonthermal pit to the south (Feature 10620).

A house-in-pit, Feature 10615, was located 6.7 m to the southeast (see Appendix A). Originating on the surface of Unit IIs/sf, the structure was overlain by Unit IV. A thermal pit intrusive to the house, Feature 15834, was in the same horizon. These features dated to the Late Archaic to Pioneer period and were possibly in use at the same time as Feature 18880.

Middle Archaic to Pioneer Period Component

Feature 11146
Feature type: nonthermal pit (NN1)
Age: Middle Archaic to Pioneer period
Locus: Area B
Grid location: E6
Level of effort: partial
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.24
Width (m): 0.22
Excavated depth (m): 0.05
Volume (m^3): 0.010

Excavation Methods

Feature 11146 was an extramural nonthermal pit in the northeastern portion of Area B (see Appendix A). The feature represents a typical shallow nonthermal non-bell-shaped pit, the most common category on the site (NN1) (see Table 73). It was first identified during the excavation of MSU 11076, appearing as a dark, circular area on the stripping surface. The pit was bisected, and the southern half (SEC 11560) was removed by hand-excavation (Figure 177). Because of difficulty in defining the feature edges, the width and depth of SEC 11560 were over-excavated (Figure 178). A flotation sample was obtained from the upper part of the section, and the remaining fill was screened through 1/4-inch hardware cloth. A pollen sample was scraped from the base of the pit.

Feature Fill

The pit contained a single stratum of dark grayish brown silty clay loam. The sediment was ashy but did not contain visible charcoal. Sixteen pieces of FAR were the only artifacts in the pit.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 11146 originated at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit IIA surface and Unit IV provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), corresponding to the Middle Archaic to Pioneer period.

Figure 177. Post-excavation photograph of Feature 11146 (a shallow, nonthermal, non-bell-shaped pit of typical volume [NN1]) at Falcon Landing, view from above.

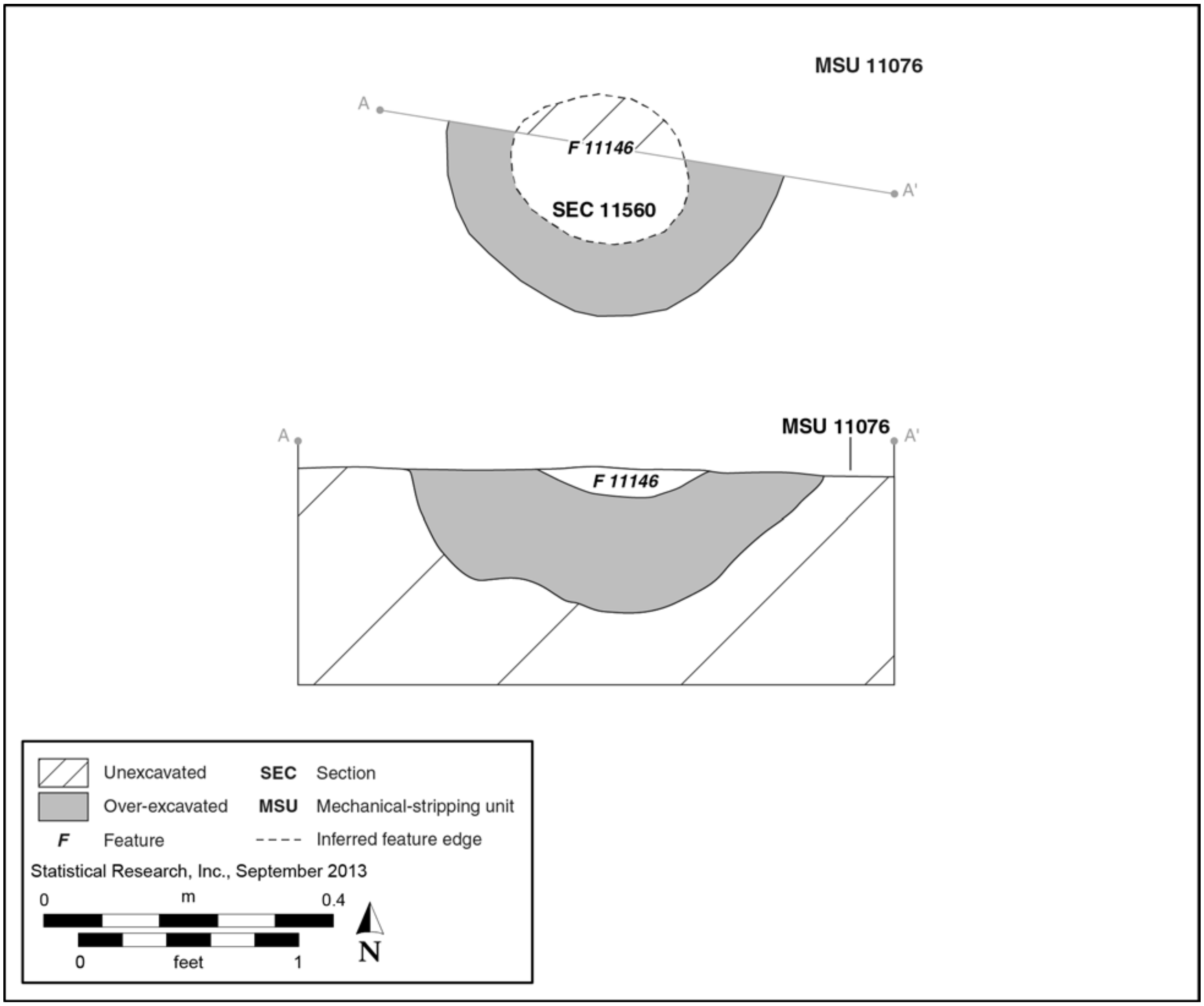

Figure 178. Mid-excavation plan view and cross section of Feature 11146 (a shallow, nonthermal, non-bell-shaped pit of typical volume [NN1]) at Falcon Landing.

<u>**Radiocarbon Analysis**</u>
None.

Abandonment Processes
The feature may represent a shallow ash dump from a thermal feature. The pit was very shallow and may also be the remnant of a small ash lens or surface fire.

Stratigraphic Relationships and Associated Features
The geochronologic position of Feature 11146 resulted in a date range that corresponds to the Middle Archaic to Pioneer period. Several pits in the same stratigraphic horizon were located within a 10-m radius of Feature 11146 (see Appendix A) and may be contemporaneous. These include four nonthermal pits (Features 11129, 11141, 11143, and 11147). Feature 11140 was a nonthermal pit in Unit IV, dating to the Pioneer to Classic period.

Feature 18168

Feature type: thermal pit (TB1)
Age: Middle Archaic to Pioneer period
Locus: Area B
Grid location: H1
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 0.82
Width (m): 0.82
Excavated depth (m): 0.48
Volume (m³): 0.170

Excavation Methods

Feature 18168 was an extramural thermal bell-shaped pit identified during the excavation of MSU 18128, in the northwestern portion of Area B (see Appendix A). The feature was categorized as a shallow thermal bell-shaped pit with a typical volume (TB1) (see Table 73). It was first identified in plan view as a circular stain with charcoal, ash, and an oxidized rind. Mechanical exposure disturbed and removed an unknown amount of the upper portion of this feature. The pit was bisected and excavated in two sections (SECs 20683 and 20972), and each half was hand-excavated in a single level and screened through 1/4-inch hardware cloth (Figure 179). Flotation and pollen samples were collected from the fill of each section. At the completion of excavation, the excavator drew a scaled plan map and cross section and took digital photographs (Figure 180).

Feature Fill

Feature 18168 contained a single stratum of loosely compact, brown sandy loam with a moderate density of charcoal. The pit walls were oxidized and blackened, and patches of oxidation were present in the fill. In total, 17 artifacts were recovered: 10 pieces of flaked stone debitage, 6 unworked faunal-bone specimens, and 1 piece of FAR. Rodent burrowing was visible in the pit walls.

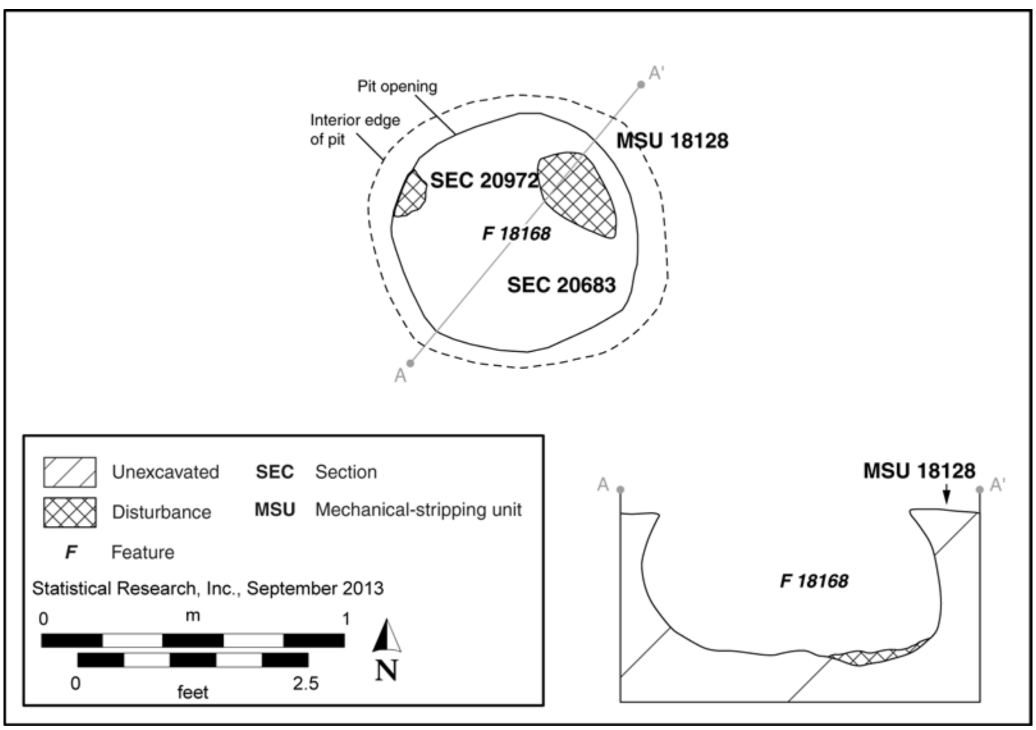

Figure 179. Post-excavation plan view and cross section of Feature 18168 (a shallow, thermal, bell-shaped pit of typical volume [TB1]) at Falcon Landing.

Figure 180. Post-excavation photograph of Feature 18168 (a shallow, thermal, bell-shaped pit of typical volume [TB1]) at Falcon Landing, view from above.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 18168 originated at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit IIA surface and Unit IV provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), corresponding to the Middle Archaic to Pioneer period.

Radiocarbon Analysis
No samples were submitted for analysis.

Abandonment Processes
The heavily oxidized pit walls indicate that the feature was originally used, possibly more than once, for thermal processing of food or some other resource. It is also possible that the pit was used for storage and that it was intentionally burned to harden the walls or remove contaminants. The pit fill, which contained a relatively large amount of charcoal, may have been purposely redeposited in the pit after its use. The lack of stratigraphy also suggests that the pit was filled in a single episode.

Stratigraphic Relationships and Associated Features
Few features were in the vicinity of Feature 18168 (see Appendix A). All were potentially contemporaneous extramural pits. Feature 18167 was a thermal pit 4.3 m to the east and in the same stratigraphic horizon as Feature 18168. Features 18165, 18166, 18169, and 18170 were all nonthermal pits dating to the Chiricahua phase.

San Pedro Phase Component

Feature 4355

Feature type: nonthermal pit (NN3)
Age: San Pedro phase
Locus: Area B
Grid location: D1
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 1.80
Width (m): 1.50
Excavated depth (m): 0.31
Volume (m^3): 0.530

Excavation Methods

Feature 4355 was an extramural nonthermal pit in the southwestern portion of Area B. The pit had an atypically large volume for a nonthermal non-bell-shaped pit on the site (NN3) (see Table 73). It was identified during mechanical stripping of MSU 4342 (see Appendix A). The feature appeared as a charcoal-stained oval on the substrate, and because of its large size, it was originally thought to be a structure. Following the feature's plan-view exposure in MSU 4342, a flotation sample was collected from the fill. A macrobotanical sample obtained from the flotation sample was submitted for further analysis (see Chapter 6, Volume 2). Hand-excavation proceeded with the placement of a 1-by-1-m test unit (TP 2898) in the center of the feature (Figure 181). The unit was excavated in arbitrary 10-cm levels until the base of the feature was encountered. Flotation and pollen samples were collected from each level, including the base of the pit. The remainder of the feature was then divided into two sections (see Figure 181). The eastern section (SEC 5233) was excavated in two levels; the edges of the feature were difficult to define in Level 1, and it was over-excavated, but Level 2 was confined to the base of the pit. All fill was screened through 1/4-inch mesh. Flotation samples were removed from both levels, and a pollen sample was taken from the first level. The western section, SEC 4576, was excavated in a single level. No samples were collected from this section. During the removal of the sections, the feature was determined to be a pit. The excavators then drew a cross section and plan view and took digital photographs (Figure 182).

Feature Fill

The pit contained a moderately compact, brown silt loam with a low density of charcoal flecks. Carbonate filaments and blebs were present in the lower fill. Rodent disturbance was noted throughout the fill and in the southern base of the pit. Artifacts included 2 projectile points, 92 pieces of flaked stone debitage, 1 edge-modified flake, and 17 faunal-bone specimens. A few pieces of FAR were noted in the fill but were not collected.

Chronometric Data

Diagnostic Material Culture

A San Pedro projectile point was recovered from Level 1 of the test pit, and a Datil projectile point was recovered from Level 2. San Pedro projectile points date to 1200 B.C.–A.D. 500, and Datil points were manufactured between 1200 B.C. and A.D. 50 (Sliva 2009). For additional information regarding these projectile points, refer to Chapter 3, Volume 2.

Geochronologic Analysis

Feature 4355 originated in Unit IIs/sf. The bracketing age range for Unit IIs/sf is ca. 2570–790 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of burned mesquite (*Prosopis* sp.) wood from the upper fill of Feature 4355 was submitted to Aeon for AMS analysis. It returned a 2σ calibrated date of 1110–1000 cal. B.C. (Aeon Sample No. 750). This time span corresponds with the San Pedro phase of the Late Archaic period (see Chapter 2, Volume 2).

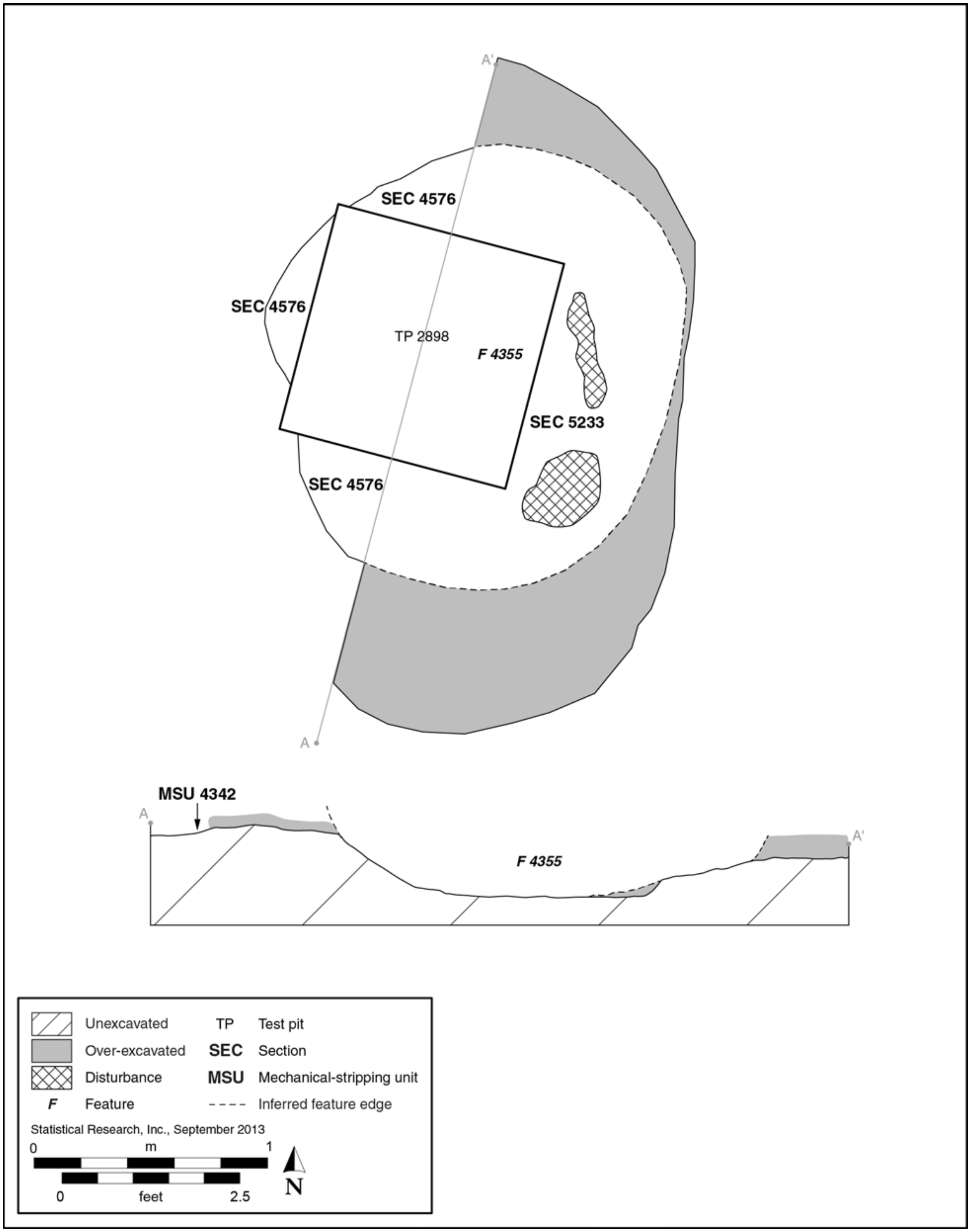

Figure 181. Post-excavation plan view and cross section of Feature 4355 (a shallow, nonthermal, non-bell-shaped pit of atypical volume [NN3]) at Falcon Landing.

Figure 182. Post-excavation photograph of Feature 4355 (a shallow, nonthermal, non-bell-shaped pit of atypical volume [NN3]) at Falcon Landing, view to the west.

Abandonment Processes

The feature may have been a storage pit that was cleaned of its contents. Because it contained a relatively large amount of artifacts, it appears to have been filled with refuse sometime during the occupation of the site.

Stratigraphic Relationships and Associated Features

The stratigraphic position of Feature 4355 corresponds to the Middle to Late Archaic period. This is supported by the radiocarbon date and the projectile points, both of which indicate that the feature dated to the San Pedro phase of the Late Archaic period.

A sparse arrangement of pits was present in the vicinity of Feature 4355 (see Appendix A). The only features that were also in stratigraphic Unit IIs/sf were two nonthermal pits, Features 4356 and 4357, located about 3 m to the southeast. Two other nonthermal pits were within 10 m of Feature 4355. Feature 4354 dated to the Early to Middle Archaic period, but it predated Feature 4355. Feature 4358 originated in Unit III1, corresponding to the Middle to Late Archaic period, and possibly existed at the same time as Feature 4355.

Feature 15482

Feature type: thermal pit (TB3)
Age: San Pedro phase
Locus: Area B
Grid location: G3
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 1.15
Width (m): 1.05
Excavated depth (m): 0.70
Volume (m^3): 0.383

Excavation Methods

Feature 15482 was an extramural thermal pit identified during the excavation of MSU 15355 in the north-central portion of Area B (see Appendix A). Feature 15482 was classified as a shallow thermal bell-shaped pit with an atypical volume (TB3) (see Table 73). Upon discovery, it was identified in plan view as a charcoal-stained circle with FAR. The pit was bisected in two sections (SECs 20363 and 20442), and hand-excavation proceeded with the removal of each half in a single level (Figure 183). The fill was screened

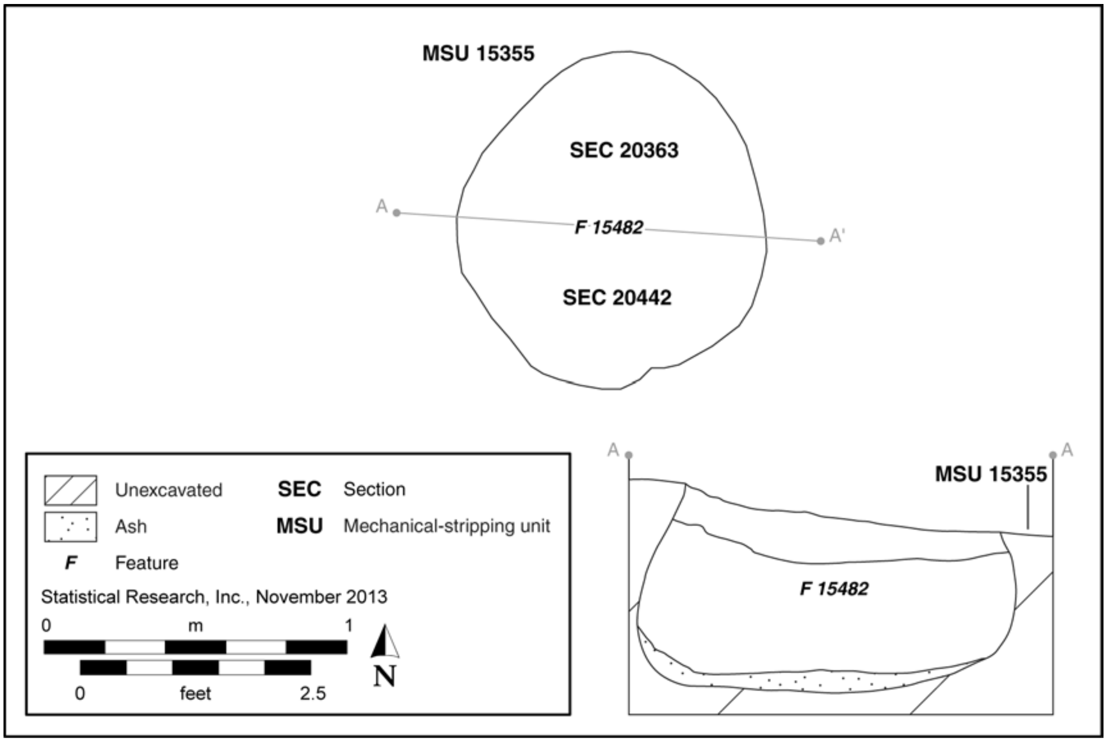

Figure 183. Mid-excavation plan view and cross section of Feature 15482 (a shallow, thermal, bell-shaped pit of atypical volume [TB3]) at Falcon Landing.

through 1/4-inch mesh. Flotation samples were collected from each section, and pollen samples were obtained from the upper stratum and from the base of the pit. At the completion of excavation, the excavator drew a scaled plan map and cross section and took digital photographs (Figure 184). Following excavation, archaeomagnetic samples were collected from the oxidized base of the pit.

Feature Fill

Two strata were observed in the pit. In the upper 10–15 cm was a dark grayish brown compacted silt with abundant charcoal and oxidized sediments. The lower stratum was a looser consistency and lighter in color and contained the same burned material as the upper layer. A layer of ash was at the base of the pit. The walls and base of the pit had a heavily oxidized rind that was 1–3 cm thick. Rodent and insect disturbances were noted throughout the fill, and mechanical exposure had disturbed and removed an unknown amount of the upper portion of the feature. Artifacts in the pit included an unidentified plain ware sherd and 16 pieces of flaked stone debitage. FAR was noted but not collected. A macrobotanical sample from the pit fill was submitted for further analysis (see Chapter 7, Volume 2).

Chronometric Data

Diagnostic Material Culture

A single untempered rim sherd was recovered from the fill of Feature 15482 (see Chapter 5, Volume 2) and may correspond to incipient plain ware sherds identified at other Archaic period–aged sites in the Tucson Basin (Heidke 1999).

Figure 184. Post-excavation photograph of Feature 15482 (a shallow, thermal, bell-shaped pit of atypical volume [TB3]) at Falcon Landing, view to the north.

Geochronologic Analysis

Feature 15482 originated at the surface of Unit IIs/sf, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the surface of Unit IIs/sf and Unit IV provides a geochronologic date range of ca. 790 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of burned mesquite (*Prosopis* sp.) wood from the lower stratum was submitted to Aeon for AMS analysis. It returned a 2σ calibrated date of 1200–1000 cal. B.C. (Aeon Sample No. 1500) (see Chapter 2, Volume 2). This date range corresponds to the San Pedro phase of the Late Archaic period.

Abandonment Processes

This relatively large pit was probably used for cooking and possibly represents multiple uses. The two strata in the pit may represent two episodes of use. After food or other processed resources had been recovered from the pit, the remaining burned material, including fuel wood, was redeposited into the feature. The ash lens at the bottom may have been left in place.

Stratigraphic Relationships and Associated Features

Feature 15482 was within a cluster of six thermal pits. Feature 15480, another thermal pit, was 1.65 m to the west. Feature 15481, a thermal pit, was 1.9 m to the southwest. Feature 15452 was another thermal pit and was 7.8 m to the southwest. Feature 15443 was a thermal pit 7.3 m to the southwest. Feature 15476 was a thermal pit 5.3 m to west.

Late Archaic to Pioneer Period Component

Feature 15076

Feature type: nonthermal pit (NB2)
Age: Late Archaic to Pioneer period
Locus: Area B
Grid location: E3
Level of effort: sampled
Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 0.94
Width (m): 0.80
Excavated depth (m): 0.85
Volume (m³): 0.335

Excavation Methods

Feature 15076 was an extramural nonthermal bell-shaped pit in the north-central portion of Area B (see Appendix A). In comparison to other nonthermal bell-shaped pits, Feature 15076 was deep and had a typical volume (NB2) (see Table 73). The pit first appeared as a darker stain in MSU 15068. The feature was bisected, the northern half of the pit was excavated with one section (SEC 16246), and the eastern edge of SEC 16246 was partially overexcavated. The fill was not screened, but the removed fill was inspected for artifacts. Pollen, flotation, and C14 samples were collected from the fill. The excavator then drafted a plan view and cross section of the feature (Figure 185) and took digital photographs (Figure 186).

Feature Fill

The pit contained a single stratum of soft, light yellowish brown silt loam with sparse inclusions of charcoal throughout the feature fill. Minor carbonate development was noted in the fill. The edges of the pit were defined by the presence of a more compact silt loam with small gravel inclusions and more abundant carbonate nodules. Minor rodent and insect disturbance was noted. No artifacts were recovered from the feature.

Chronometric Data

<u>**Diagnostic Material Culture**</u>

None.

<u>**Geochronologic Analysis**</u>

Feature 15076 originated at the surface of Unit II s/sf, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the Unit II s/sf surface and Unit IV provides a geochronologic date of ca. 790 cal B.C.–cal A.D. 610 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Pioneer period.

<u>**Radiocarbon Analysis**</u>

None.

Abandonment Processes

The pit appeared to have been filled by natural processes; no lamination was noted in the sediment. The presence of charcoal throughout the fill may have been washed in through alluvial processes, or alternatively, the pit may have been cleaned out and intentionally filled with sediment containing occasional pieces of charcoal.

Stratigraphic Relationships and Associated Features

Feature 15076 was present at the surface of Unit II s/sf, suggesting that it was occupied sometime during or after the Late Archaic period. Few features were in proximity of Feature 15076, including five non-thermal pits (Features 3152, 3155, 3156, 15077, and 15085) (see Appendix A). Features 3152 and 3156 are roughly contemporaneous with Feature 15076, both corresponding to the Late Archaic to Pioneer period. Feature 3155 was dated to the Late Cienega to Red Mountain phase, thus being potentially contemporaneous. Features 15077 and 15085 both predate Feature 15076 and were dated to the Middle to Late Archaic period.

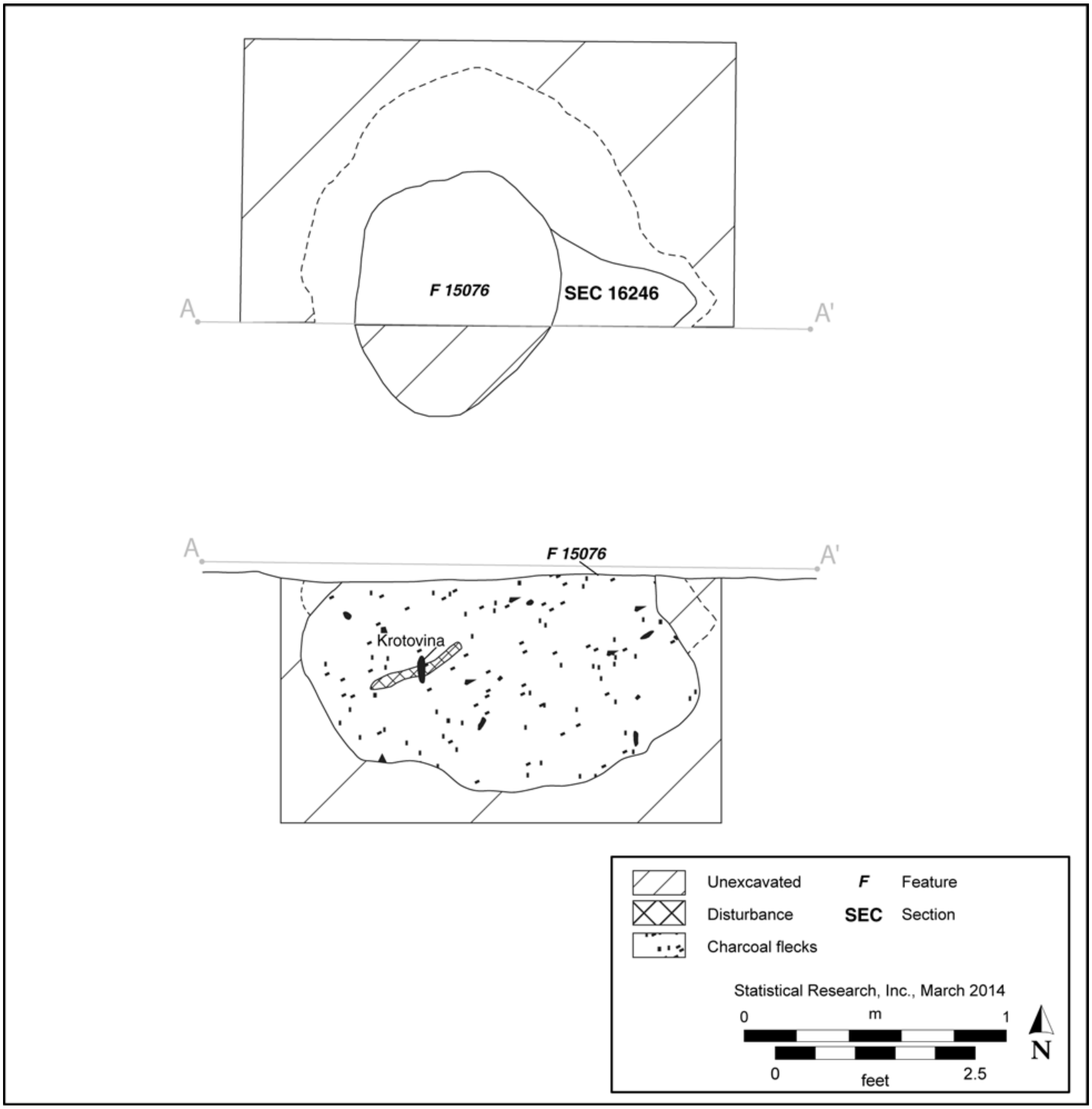

Figure 185. Mid-excavation plan view and cross section of Feature 15076 (a deep, nonthermal, bell-shaped pit of typical volume [NB2]) at Falcon Landing.

Figure 186. Mid-excavation photograph of Feature 15076 (a deep, nonthermal, bell-shaped pit of typical volume [NB2]) at Falcon Landing, view to the south.

Feature 15209

Feature type: thermal pit (TB1)
Age: Late Archaic to Pioneer period
Locus: Area B
Grid location: F3
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 0.89
Width (m): 0.87
Excavated depth (m): 0.40
Volume (m^3): 0.160

Excavation Methods

Feature 15209 was an extramural thermal bell-shaped pit located in the north-central portion of Area B (see Appendix A). The feature represents a typical shallow thermal bell-shaped pit (TB1) (see Table 73). First identified on MSU 15068 during mechanical stripping, the feature appeared as a charcoal-stained circle on the substrate. The pit was bisected and excavated in two sections (SECs 13714 and 17280), and each half was removed in a single level (Figures 187 and 188). The western margin of Feature 15209 was slightly over-excavated. Flotation samples were removed from each section, and the remaining fill was screened through 1/4-inch hardware cloth.

Feature Fill

Two strata were recognized in the pit fill. All but the bottom 1–2 cm consisted of a soft to slightly hard, yellowish brown silty clay loam. Moderate amounts of charcoal and ash were included in the sediment. A thin layer of ash covered the oxidized base of the pit. Artifacts in the fill included four pieces of lithic debitage and one piece of FAR.

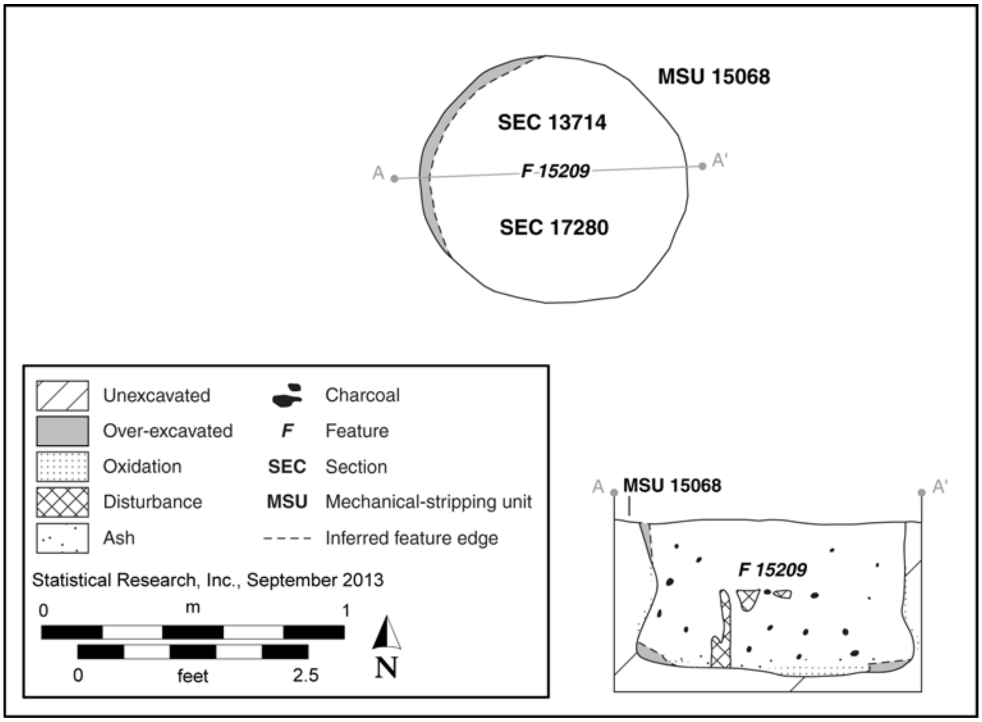

Figure 187. Mid-excavation plan view and cross section of Feature 15209 (a shallow, thermal, bell-shaped pit of typical volume [TB1]) at Falcon Landing.

Figure 188. Post-excavation photograph of Feature 15209 (a shallow, thermal, bell-shaped pit of typical volume [TB1]) at Falcon Landing, view to the north.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 15209 originated at the surface of Unit IIs/sf, with Unit IV sediments overlying it. The unconformity between Unit IIs/sf and Unit IV provides a geochronologic date range of ca. 790 cal. B.C.–A.D. 610 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Pioneer period.

Radiocarbon Analysis
None.

Abandonment Processes
The ash lens at the base of the pit may be the remnants of the feature's final use. The upper fill of Feature 15209 likely represents alluvial sediments containing cultural material from other areas of the site.

Stratigraphic Relationships and Associated Features
Feature 15209 was located within a circular arrangement of potentially contemporaneous extramural features (see Appendix A), many of which originated in the same stratigraphic unit. These included six nonthermal pits (Features 15168, 15173, 15187, 15188, 15206, and 15208) and two thermal pits (Features 15194 and 15197).

Late Archaic to Protohistoric Period Component

Feature 3932
Feature type: thermal pit (TN1)
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: D2
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.78
Width (m): 0.65
Excavated depth (m): 0.20
Volume (m^3): 0.050

Excavation Methods
Feature 3932 was an extramural thermal pit in the south-central portion of Area B (see Appendix A). It represents a shallow thermal non-bell-shaped pit with a typical volume (TN1) (see Table 73). First identified during the excavation of MSU 3873, the feature appeared on the substrate as a charcoal- and ash-stained oval. The pit was bisected, and each of the sections (SECs 7042 and 7067) was removed in a single level (Figures 189 and 190). The fill was screened through 1/8-inch mesh, and flotation and pollen samples were obtained from each section.

Feature Fill
The pit contained a single stratum of soft, grayish brown silt loam with ash and charcoal pieces. Insect burrows gave the fill a mottled appearance. No artifacts were present. The walls and base of the pit were blackened and oxidized.

Chronometric Data

Diagnostic Material Culture
None.

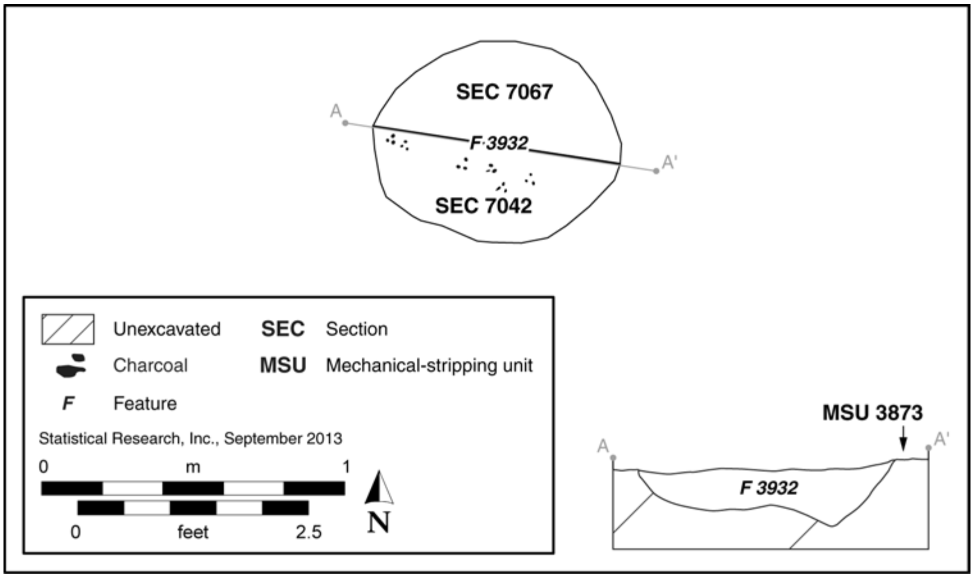

Figure 189. Mid-excavation plan view and cross section of Feature 3932 (a shallow, thermal, non-bell-shaped pit of typical volume [TN1]) at Falcon Landing.

Figure 190. Mid-excavation photograph of Feature 3932 (a shallow, thermal, non-bell-shaped pit of typical volume [TN1]) at Falcon Landing, view to the north.

Geochronologic Analysis
Feature 3932 originated on the surface of Unit III1, with late Holocene or Historical period silt loam alluvium (Unit V) overlying it. The unconformity between the Unit III1 surface and Unit V provides a geochronologic date of ca. 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
Feature 3932 was a thermal pit containing ash and charcoal that may represent materials from the final use of the pit. The pervasive insect disturbance may have obscured the original internal stratigraphy of the pit.

Stratigraphic Relationships and Associated Features
Feature 3932 originated at the surface of Unit III1 and underlay Unit V, indicating that it was associated with a fairly long span of time during the Late Archaic to Protohistoric period. Three features within 10 m of Feature 3932 were in the same stratigraphic position (see Appendix A). An activity area, Feature 3954, was located 9.5 m to the southwest. A thermal pit (Feature 3930) and a nonthermal pit (Feature 3933) were also nearby. Other neighboring features originated within the Unit III1 horizon, dating to the Middle to Late Archaic period. These included seven nonthermal pits (Features 3931, 3936, 3937, 3938, 3939, 3949, and 3950) and a thermal pit (Feature 3932).

Early Cienega Phase Component

Feature 1315
Feature type: thermal pit (TN1)
Age: Early Cienega phase
Locus: Area B
Grid location: F1
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.86
Width (m): 0.80
Excavated depth (m): 0.30
Volume (m^3): 0.110

Excavation Methods
Feature 1315 was an extramural thermal pit in the southeastern corner of Area B (see Appendix A). It was categorized as a shallow thermal non-bell-shaped pit with a typical volume (TN1) (see Table 73). The pit was first identified on the surface of MSU 1281 as a charcoal- and ash-stained circle with FAR. Mechanical stripping had disturbed and removed an unknown quantity of the upper part of the pit. Hand-excavation proceeded with the removal of the northern half of the feature (SEC 6364) in a single level. A flotation sample was removed from the fill, the remainder of which was screened through 1/8-inch hardware cloth. Removal of the southern half (SEC 6401) followed the same procedure. A pollen sample was scraped from the base of the pit (Figures 191 and 192). A macrobotanical sample was also collected from the upper fill and submitted for analysis (see Chapter 6, Volume 2).

Feature Fill
The pit contained a single stratum of slightly to moderately hard, dark gray-brown silt loam. Large amounts of charcoal, ash, and oxidized soil were present. The base and the sides of the pit were also oxidized. Minimal numbers of rootlets and insect burrows were the only disturbances. Over 100 pieces of FAR were noted but not collected. Artifacts recovered from the pit included 3 pieces of unworked faunal bone, 1 cobble manuport, 1 indeterminate ground stone fragment, 1 cobble-mano fragment, and 2 metate fragments.

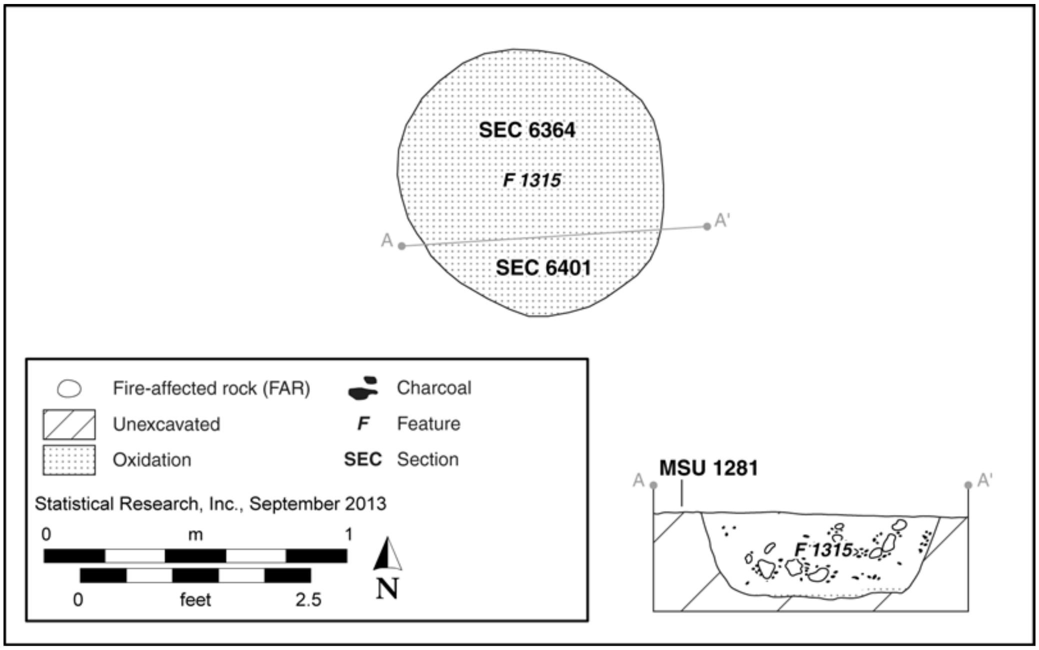

Figure 191. Mid-excavation plan view and cross section of Feature 1315 (a shallow, thermal, non-bell-shaped pit of typical volume [TN1]) at Falcon Landing.

Figure 192. Mid-excavation photograph of Feature 1315 (a shallow, thermal, non-bell-shaped pit of typical volume [TN1]) at Falcon Landing, view to the south.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 1315 was located at the surface of Unit I, with Late Holocene alluvial-fan deposits (Unit III2) overlying it. The unconformity between the Unit I surface and Unit III2 provides a geochronologic date of ca. 5320–720 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis
A piece of burned mesquite wood (*Prosopis* sp.) from the pit fill returned a 2σ calibrated date of 770–540 cal. B.C. (Aeon Sample No. 744) (see Chapter 2, Volume 2). This date range corresponds to the Early Cienega phase of the Late Archaic period.

Abandonment Processes
Feature 1315 is interpreted as a roasting pit with de facto refuse from its last use. The ground stone fragments may have been exhausted tools that were then reused in the thermal feature.

Stratigraphic Relationships and Associated Features
Several features within 10 m of Feature 1315 were also in the same stratigraphic unit (see Appendix A). These include an activity area and a structure that are potentially from the same period of occupation as Feature 1315. Feature 1337 was an activity area 1.5 m to the east. A house-in-pit, Feature 1313, was 2.5 m to the southwest. Another house-in-pit, Feature 1498, was in the same stratigraphic horizon but was radiocarbon dated to the late Chiricahua phase. A nonthermal pit, Feature 1307, returned a radiocarbon date corresponding to the San Pedro phase. The three adjacent radiocarbon-dated features in the same horizon suggest that the aboriginal surface was usable for over 1,000 years. Five other nonthermal pits were located within a 10-m radius of Feature 1315, and all were in the same stratigraphic horizon: Features 1312, 1376, 1377, 1399, and 6166.

Feature 11130
Feature type: nonthermal pit (NB1)
Age: Early Cienega phase
Locus: Area B
Grid location: D6
Level of effort: partial
Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 1.27
Width (m): 1.23
Excavated depth (m): 0.44
Volume (m^3): 0.360

Excavation Methods
Feature 11130 was an extramural nonthermal pit identified during the excavation of MSU 11075, in the northeastern portion of Area B (see Appendix A). The feature represents a typical nonthermal bell-shaped pit on the site (NB1) (see Table 73). It was first identified in plan view on the MSU as an ash-stained circle with FAR and ground stone.

The pit was bisected, and the southern half (SEC 11552) was removed in a single level and screened through 1/4-inch mesh (Figure 193). A flotation sample was collected from the fill, and a pollen sample was scraped from the base of the pit. At the completion of excavation, the excavator drew a scaled plan map and cross section and took digital photographs (Figure 194).

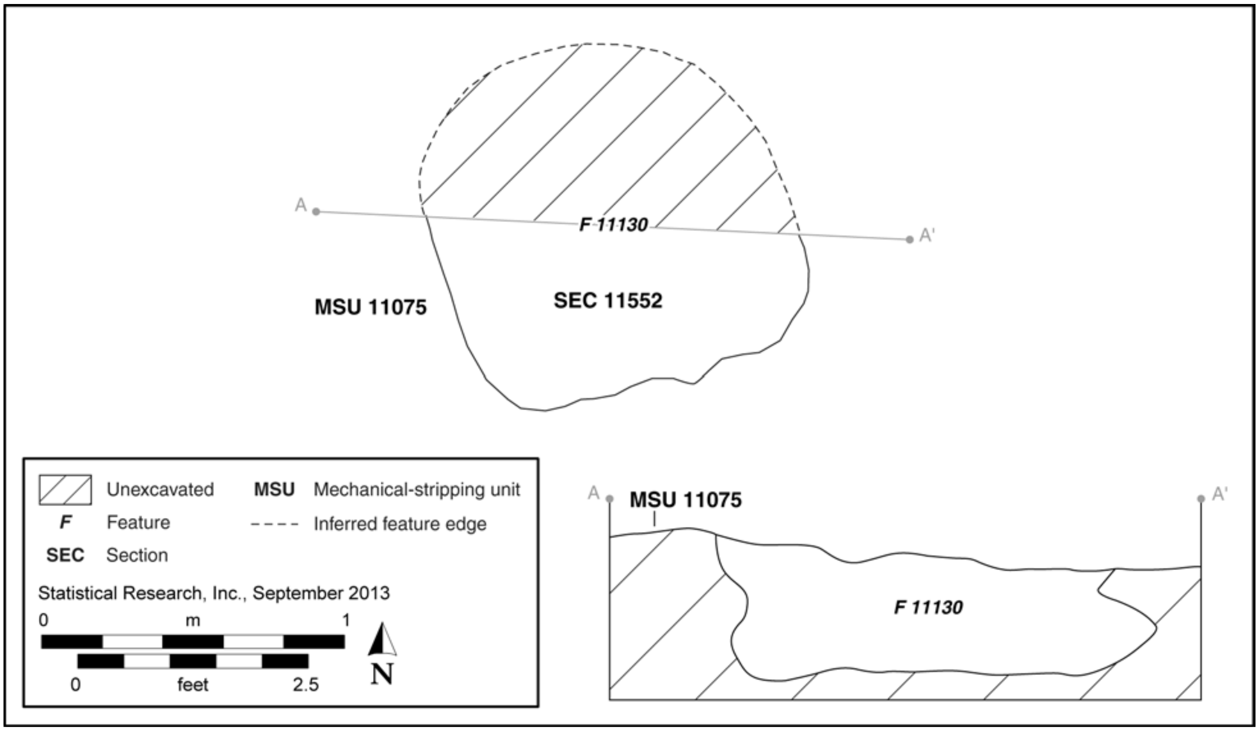

Figure 193. Mid-excavation plan view and cross section of Feature 11130 (a shallow, nonthermal, bell-shaped pit of typical volume [NB1]) at Falcon Landing.

Figure 194. Post-excavation photograph of Feature 11130 (a shallow, nonthermal, bell-shaped pit of typical volume [NB1]) at Falcon Landing, view to the south.

Feature Fill

The pit contained a single stratum of yellowish brown sandy loam with no visible charcoal. The pit walls and base were oxidized. Artifacts in the fill included two pieces of unworked faunal bone, one manuport, two ground stone fragments, and seven pieces of FAR. Bioturbation from roots and insects was noted in the fill.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 11130 was located on the Unit IIA surface, underlying late Holocene alluvial-fan deposits (Unit IV). The unconformity between the Unit IIA surface and Unit IV provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of mesquite wood (Prosopis sp.) was submitted to Aeon for AMS dating. It returned a 2σ calibrated date range of 790–550 cal. B.C. (Aeon Sample No. 1527) (see Chapter 2, Volume 2), corresponding to the Early Cienega phase of the Late Archaic period.

Abandonment Processes

Although the pit may have been used for the thermal processing of food or other resources, the fill seemed thermally unaffected and likely represents naturally deposited alluvial or aeolian sediments that accumulated after the use of the pit. Alternatively, the pit may have been used for storage, with the walls purposely burned to harden the sediments or remove contamination.

Stratigraphic Relationships and Associated Features

Feature 11130 originated at the surface of Unit IIA, the age of which corresponds to the Middle Archaic to Pioneer period. Radiocarbon dates from the feature indicate a more specific date range corresponding to the Early Cienega phase of the Late Archaic period. Within 10 m of Feature 11130, the Unit IIA surface was occupied by 13 features that may be contemporaneous with Feature 11130 (see Appendix A). These included a surface structure, Feature 11105, 1.5 m to the west. No absolute dates were obtained for the structure, but a pit at its southwestern corner (Feature 11106) was radiocarbon dated and returned a 2σ calibrated range of 790–520 cal. B.C. (Aeon Sample No. 1504), corresponding to the Early Cienega phase. Extramural pits in the same stratigraphic position included 11 nonthermal pits (Features 11093, 11096, 11103, 11104, 11106, 11107, 11108, 11124, 11128, 11129, and 11131) and 1 thermal pit (Feature 11102).

Late Cienega to Red Mountain Phase Component

Feature 10731

Feature type: nonthermal pit (NB3)
Age: Late Cienega to Red Mountain phase
Locus: Area A
Grid location: H5
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 1.28
Width (m): 1.26
Excavated depth (m): 0.97
Volume (m^3): 0.820

Excavation Methods

Feature 10731 was an extramural nonthermal bell-shaped pit in the central portion of Area A (see Appendix A). The pit is one of two shallow nonthermal bell-shaped pits with atypically large volumes (NB3) (see Table 73). It was identified during the excavation of MSU 10718, appearing as a circle with charcoal, ash, and FAR. The pit was bisected (SECs 12923 and 15001), and each half was hand-excavated in a single level (Figure 195). SEC 12923 was over-excavated in an attempt to identify the pit edges. Once the feature was visible in profile, SEC 15001 was excavated. A flotation sample was removed from SEC 12923, and the remaining fill of both sections was screened through 1/4-inch hardware cloth. A pollen sample was scraped from the base of the pit. At the completion of excavation, the excavator drew a scaled plan map and cross section and took digital photographs (Figure 196).

Feature Fill

The pit contained a single stratum of soft, brown silt loam with minimal charcoal inclusions. Rodent and insect disturbances were present in the fill. The only artifacts in the pit were 10 pieces of FAR that were not collected.

Chronometric Data

Diagnostic Material Culture

None.

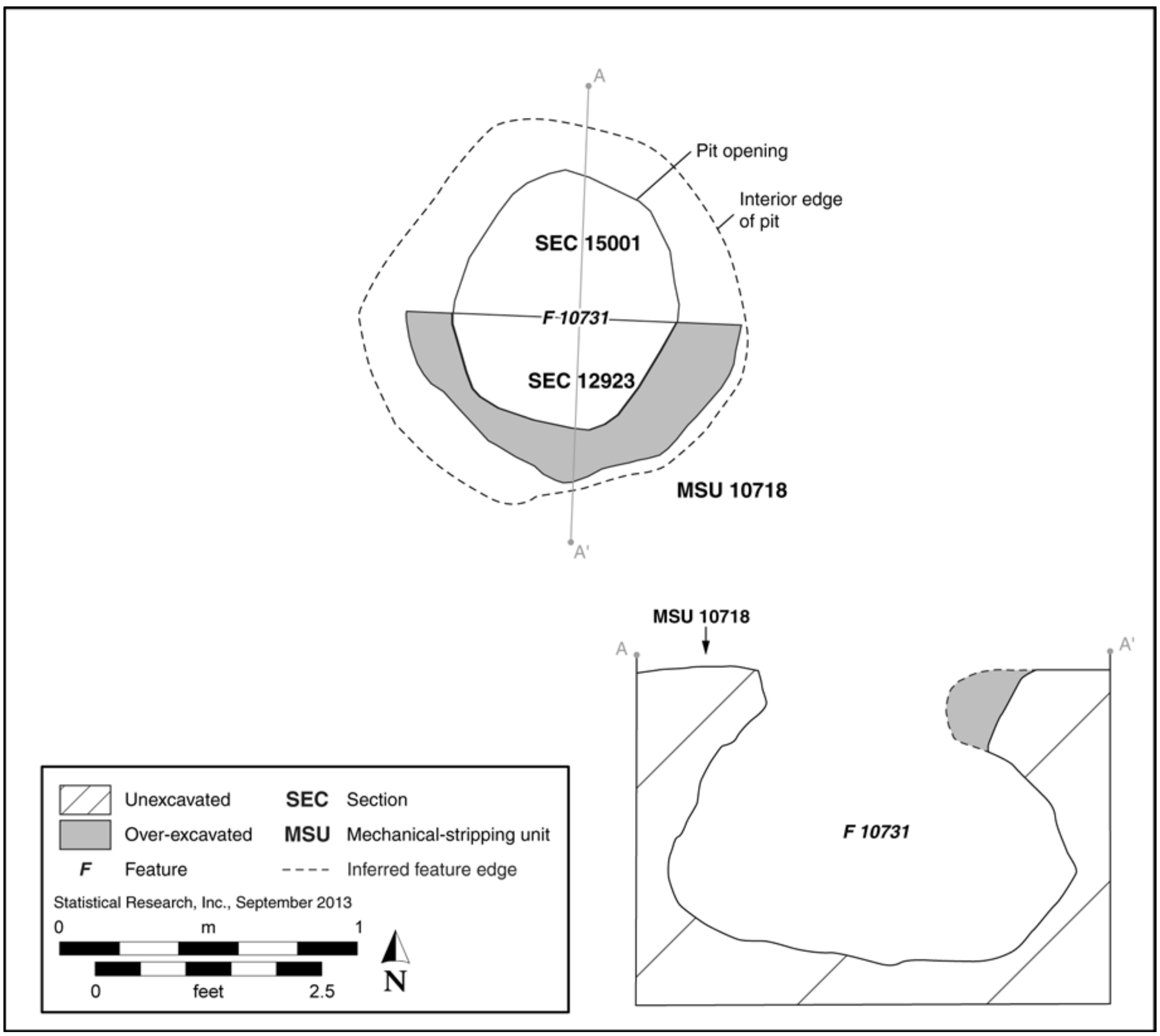

Figure 195. Post-excavation plan view and cross section of Feature 10731 (a shallow, nonthermal, bell-shaped pit of atypical volume [NB3]) at Falcon Landing.

Figure 196. Post-excavation photograph of Feature 10731 (a shallow, nonthermal, bell-shaped pit of atypical volume [NB3]) at Falcon Landing, view to the north.

<u>Geochronologic Analysis</u>

Feature 10731 originated in Unit III2cf. The bracketing age range for this unit is ca. 160 cal. B.C.–cal. A.D. 340 (see Chapter 2, Volume 2), corresponding to the Late Cienega to Red Mountain phase.

<u>Radiocarbon Analysis</u>

None.

Abandonment Processes

Feature 10731 is interpreted as a large storage pit that may have been filled by natural processes. No stratigraphy was present, although it may have been obscured by bioturbation. It is also possible that the pit was filled by the occupants of the site, as evidenced in the presence of FAR in the fill.

Stratigraphic Relationships and Associated Features

Feature 10731 was within 10 m of 10 other pits that originated in the same stratigraphic unit and dated to the Late Cienega to Red Mountain phase (see Appendix A). The closest was nonthermal-pit Feature 10759, 0.10 m to the north. Other nonthermal pits in the surrounding area included Features 10696, 10722, 10730, 10766, 10767, 10769, and 14662. Thermal-pit Features 14674 and 10736 were also in the same stratigraphic unit as Feature 10731.

A house-in-pit (Feature 10735) was 3.25 m to the northwest. It was located on the surface of Unit III2cf, below Unit V, as were two nearby thermal pits, Features 14141 and 10760. These features had a broad date range spanning the Early Ceramic to Protohistoric period and were potentially contemporaneous with Feature 10731.

Pioneer Period Component

Feature 19067

Feature type: nonthermal pit (NN1)
Age: Pioneer period
Locus: Area A
Grid location: F5
Level of effort: partial
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 1.00
Width (m): 1.00
Excavated depth (m): 0.10
Volume (m^3): 0.070

Excavation Methods

Feature 19067 was a nonthermal pit in the southeastern portion of Area A (see Appendix A). The feature represents a typical shallow nonthermal non-bell-shaped pit on the site (NN1) (see Table 73). The pit was first identified during excavation of MSU 14759, appearing as a charcoal- and ash-stained circle with FAR. The feature was bisected, and hand-excavation proceeded with the removal of the eastern half (SEC 18678) in two stratigraphic levels (Figures 197 and 198). Both levels were screened through 1/4-inch mesh, and a flotation sample was removed from Level 1. A pollen sample was taken from the base of the pit.

Feature Fill

Two distinct strata were identified in the pit fill. The upper stratum (Level 1) consisted of a slightly hard, dark yellowish brown silty clay loam with sparse charcoal flecks and FAR inclusions. The lower stratum (Level 2) consisted of a soft, yellowish brown silty clay loam containing slightly larger pieces of charcoal.

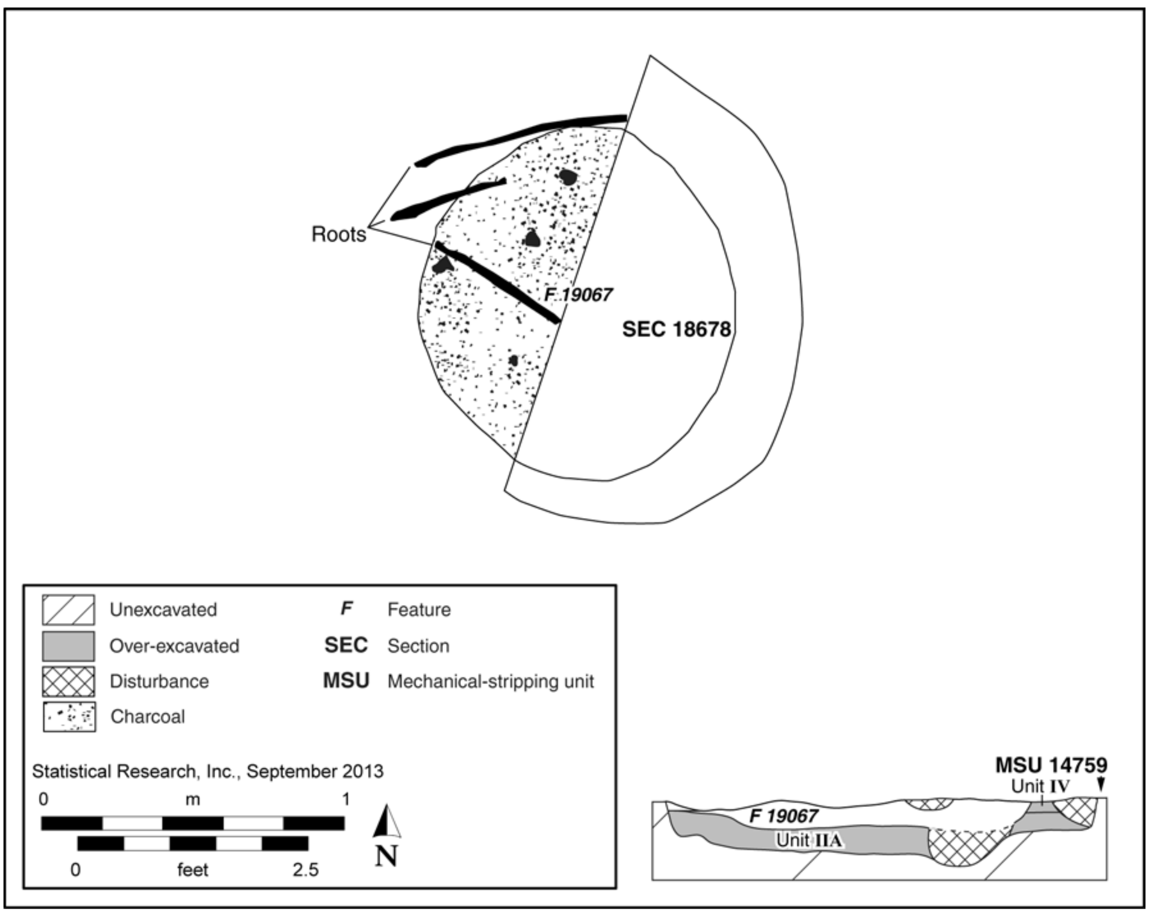

Figure 197. Mid-excavation cross section of Feature 19067 (a shallow, nonthermal, non-bell-shaped pit of typical volume [NN1]) at Falcon Landing.

Figure 198. Post-excavation photograph of Feature 19067 (a shallow, nonthermal, non-bell-shaped pit of typical volume [NN1]) at Falcon Landing, view to the west.

Plant roots caused bioturbation throughout the pit fill. Artifacts included one ceramic sherd, one unworked faunal-bone specimen, and seven pieces of FAR. A macrobotanical sample from Level 2 was submitted for analysis (see Chapter 6, Volume 2).

Chronometric Data

Diagnostic Material Culture

A Gila Plain sherd was recovered from the fill of Feature 19067 (see Chapter 5, Volume 2). Gila Plain ceramic wares date to ca. A.D. 300–1450 (Doyel and Elson 1985b:452), which overlaps in time with the Pioneer period date obtained from the radiocarbon analysis of Feature 19067 (see below).

Geochronologic Analysis

Feature 19067 originated within stratigraphic Unit IV. The bracketing age range for Unit IV is cal. A.D. 610–1220 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of charred mesquite (*Prosopis* sp.) wood was collected from Level 2 of Feature 19067 and submitted to Aeon for AMS analysis. The charcoal returned a 2σ calibrated date of A.D. 610–670 (Aeon Sample No. 1501) (see Chapter 2, Volume 2), corresponding to the Pioneer period.

Abandonment Processes

The original function of the small pit is unknown, but it appears to have contained cultural refuse from the site that was deposited in two separate episodes. It may have been refuse that was discarded in the pit sometime during the occupation of the site. The radiocarbon date and the sherd indicate that both strata in the feature dated to the Pioneer period.

Stratigraphic Relationships and Associated Features

Feature 19067 was within a cluster of nine likely contemporaneous pits (see Appendix A): seven nonthermal pits (Features 14817, 14824, 14825, 19068, 19069, 19070, and 19072), a thermal pit (Feature 19071), and a charcoal/ash lens (Feature 14801). All nine pits were within 3 m of Feature 19067.

Pioneer to Classic Period Component

Feature 3306

Feature type: thermal pit (TN3)
Age: Pioneer to Classic period
Locus: Area B
Grid location: D6
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 1.99
Width (m): 1.99
Excavated depth (m): 0.36
Volume (m^3): 0.810

Excavation Methods

Feature 3306 was an extramural thermal pit in the northeastern portion of Area B (see Appendix A). The pit was categorized as a shallow thermal non-bell-shaped pit with an atypically large volume (TN3) (see Table 73) and was one of the largest in that category. First identified during mechanical stripping of MSU 3209, the pit appeared on the substrate as a charcoal- and ash-stained circle with FAR and flaked stone. The feature was bisected, and each half (SECs 3374 and 8780) was removed by hand in a single level (Figures 199 and 200). The northern half was screened through $^1/_8$-inch mesh, and the southern half was screened through $^1/_4$-inch mesh. Pollen and flotation samples were collected from each level.

Figure 199. Mid-excavation photograph of Feature 3306 (a shallow, thermal, non-bell-shaped pit of atypical volume [TN3]) at Falcon Landing, view to the north.

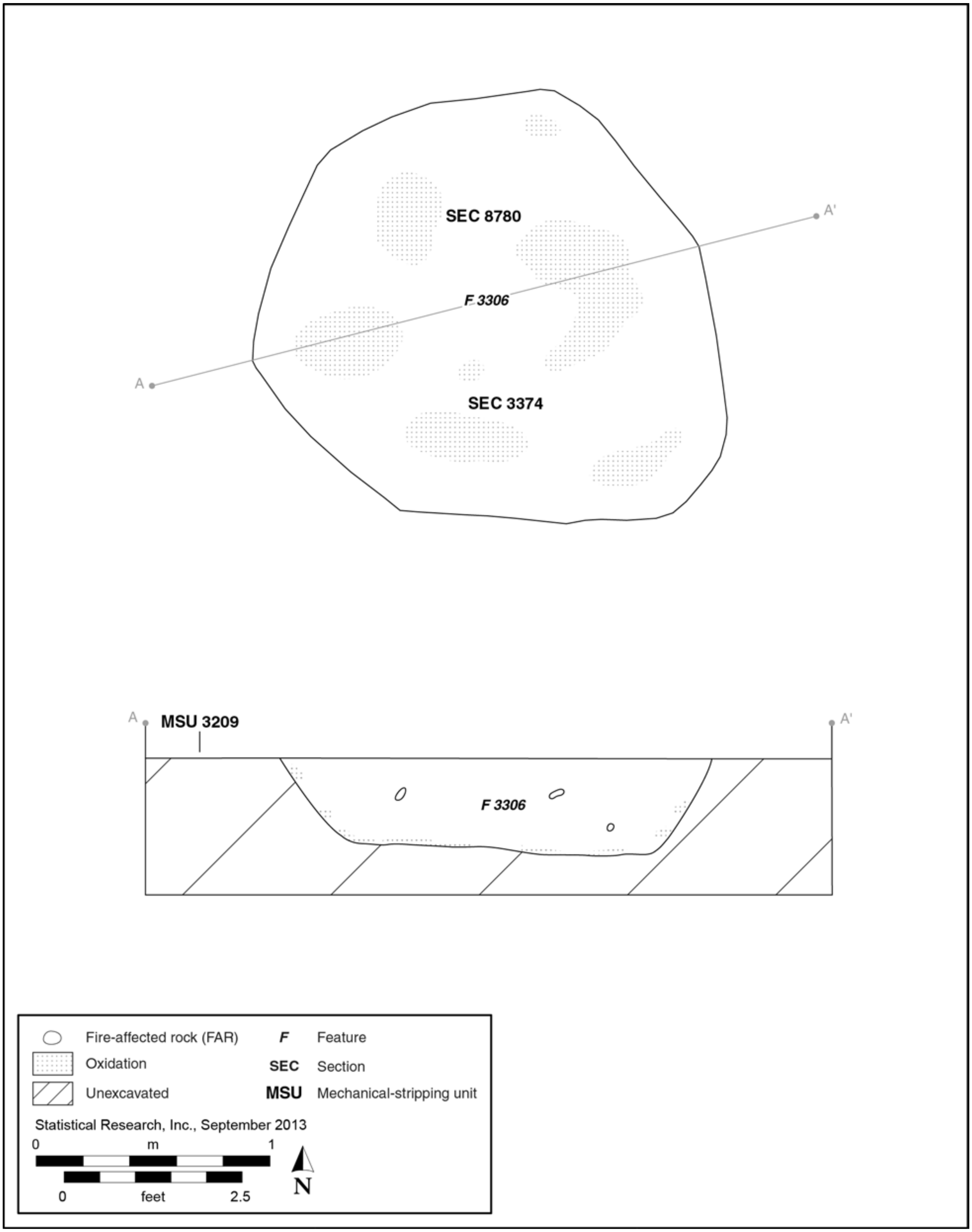

Figure 200. Mid-excavation plan view and cross section of Feature 3306 (a shallow, thermal, non-bell-shaped pit of atypical volume [TN3]) at Falcon Landing.

Feature Fill
The feature fill was a slightly hard, brown silt loam. Inclusions of charcoal, ash, and oxidized sediment were present throughout. The pit walls and base were moderately oxidized, although damage from insect, plant, and rodent activity had caused significant disturbance and obscured the feature boundaries. Artifacts included 156 pieces of unworked faunal bone, 27 pieces of lithic debitage, 1 core, 3 ground stone fragments, 3 cobble-mano fragments, 1 mano fragment, and 94 pieces of FAR.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 3306 originated within Unit IV. The bracketing age range for Unit IV is cal. A.D. 610–1220 (see Chapter 2, Volume 2), corresponding to the Pioneer to Classic period.

Radiocarbon Analysis
None.

Abandonment Processes
Thermal oxidation of the pit walls indicates that the feature was used for cooking, possibly with the FAR that was recovered from the pit. It appeared that the other artifacts in the pit represented refuse that was deposited during the occupation of the site. The faunal bone may have been the remnants of food that was cooked in the pit.

Stratigraphic Relationships and Associated Features
Feature 3306 was located within stratigraphic Unit IV, which dates to the Pioneer to Classic period. The area around Feature 3306 had a fairly dense arrangement of pits, only two of which originated in the same stratigraphic position (see Appendix A). These nonthermal pits, Features 11094 and 11095, were located 6.2 m to the northeast and 6.7 m to the north, respectively.

The remaining pits in a 10-m radius around Feature 3306 were in different stratigraphic locations. They were roughly equally divided into features on the surface of IIA, overlain by Unit IV, and features that originated in Unit IIA. These stratigraphic contexts date to the Middle Archaic to Pioneer period and the Middle Archaic period, respectively. Some of the features on the surface of Unit IIA may be contemporaneous with Feature 3306.

FAR Concentrations

FAR concentrations are defined as discrete clusters of FAR that are not specifically within an extramural-pit feature. They are believed to have been discarded on the aboriginal site surface over time. In some instances, the FAR concentrations may represent surface fires in which rock was heated for later use as heating or boiling stones, or rocks were used for parching on the surface (see Toms 2009); however, direct evidence of that is lacking. FAR concentrations may also represent cleanout of thermal pits, as many FAR concentrations are spatially associated with other extramural thermal and nonthermal pits. Of the approximately 10,000 pieces of FAR recovered from the Luke Solar project, the majority (75 percent) were from thermal and nonthermal extramural pits at Falcon Landing (see Chapter 3, Volume 2). Thermal and nonthermal pits outnumbered FAR concentrations 25 to 1 at Falcon Landing. The extramural pits routinely contained FAR, but extramural pits were defined by the presence of pits and categorized by pit morphology and thermal alteration rather than the presence or absence of FAR. Thus, an FAR concentration does not have an associated pit; rather, the FAR was most likely present on an aboriginal surface.

In total, 109 FAR concentrations were documented at Falcon Landing (Table 75). Not all the FAR at Falcon Landing was collected. In some instances, FAR was excavated from a feature, counted, then left with the feature. Approximately 940 pieces of FAR were recovered from FAR concentrations at Falcon Landing. The amount of FAR collected from an FAR concentration varied from 1 to over 100 pieces. FAR concentrations were also quite variable in size, ranging from 0.1 to 9.7 m in diameter and from 0.01 to 0.6 m in depth. Generally, the length, width, and depth of an FAR concentration was measured by the maximum distribution of FAR. For example, the depth of an FAR concentration was calculated by subtracting the elevation of the lowest thermally altered rock from the elevation of the highest thermally altered rock. The lack of a definable pit in association with an FAR concentration precluded the normal length/width/depth calculations used for other extramural-pit features. Nine of the FAR concentrations (Features 2003–2010 and 2457) were identified on the site surface during SRI's Phase 1 investigation, and 6 of those had been previously identified by Tagg (2007:39–47). These surficial FAR concentrations likely represent areas from which deflation had removed the uppermost site sediments, exposing the FAR. An example of these surficial FAR concentrations is Feature 2010, which was hand-excavated during Phase 1. A 2-by-2-m control unit (TP 2838) was excavated in a single arbitrary 10-cm level over the concentration of FAR. The excavation did not result in identification of a subsurface feature associated with the FAR, but Level 1 of TP 2838 contained 6 pieces of flaked stone debitage, a piece of faunal bone, and a mano fragment. The following are descriptions of two representative examples of FAR concentrations.

Middle to Late Archaic Period Component

Feature 3722

Feature type: FAR concentration
Age: Middle to Late Archaic period
Locus: Area B
Grid location: C5
Level of effort: partial
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 1.84
Width (m): 1.43
Excavated depth (m): 0.18
Volume (m^3): 0.470

Excavation Methods

Feature 3722 was an FAR concentration located in the southeastern portion of Area B (see Appendix A). It was originally identified during mechanical excavation of MSU 3532 as a concentration of FAR. The southern half of Feature 3722 was excavated as SEC 6559 in one approximately 15-cm stratigraphic level (Figure 201). SEC 6559 was over-excavated beyond the limit of Feature 3722, both vertically and horizontally, in order to determine whether the FAR was associated with a pit feature (Figure 202). No pit feature was identified; therefore, the excavation was halted once the entirety of the FAR in the southern half of Feature 3722 had been exposed. The northern half of Feature 3722 was not excavated.

Feature Fill

Feature 3722 was a concentration of FAR not associated with a pit. The sediments surrounding the FAR consisted of a brown sandy silt with numerous rootlets and insect disturbances. No burned material was observed, and the sediments surrounding the FAR were indistinguishable from the natural sediments, aside from the presence of FAR. Artifacts recovered from Feature 3722 included 124 pieces of FAR, 9 fire-affected indeterminate ground stone fragments, 4 fire-affected mano fragments, a fire-affected hammerstone fragment, and 4 pieces of flaked stone debitage.

Chronometric Data

<u>**Diagnostic Material Culture**</u>
None.

Table 75. FAR Concentrations at Falcon Landing, by Chronologic Group

Feature No.	Level of Effort	Density of Burned Materials in Fill	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
Early to Middle Archaic Period												
7005	partial	sparse	0.73	0.57	0.09	0.007	—	—	—	—	—	—
11425	sampled	moderate	0.55	0.48	0.17	0.046	—	1	—	—	1	43.478
Early to Late Archaic Period												
1483	partial	sparse	0.65	0.60	0.05	0.016	—	—	—	—	—	—
1524	partial	moderate	0.80	0.60	0.07	0.025	—	—	—	18	18	1,200.000
3547	complete	sparse	0.54	0.43	0.17	0.034	1	3	—	—	4	235.294
3578	partial	abundant	1.14	0.54	0.16	0.075	2	1	—	—	3	78.947
3581	partial	moderate	0.55	0.52	0.13	0.026	—	—	—	10	10	769.231
3663	partial	moderate	0.42	0.30	0.05	0.008	—	—	—	—	—	—
3706	complete	sparse	0.99	0.76	0.14	0.073	3	2	—	—	5	68.493
3783	partial	indeterminate	0.70	0.50	0.10	0.056	—	1	—	—	1	35.714
3784	partial	sparse	0.46	0.23	0.16	0.017	—	—	—	—	—	—
Early Archaic to Pioneer Period												
3683	partial	sparse	0.40	0.25	0.06	0.014	—	—	—	—	—	—
11435	sampled	sparse	0.50	0.42	0.12	0.066	—	—	—	—	—	—
13171	sampled	sparse	0.50	0.50	0.29	0.241	3	2	—	31	36	300.000
Chiricahua Phase												
7986	complete	moderate	0.68	0.62	0.18	0.052	—	9	—	—	9	214.286
9475	complete	moderate	0.26	0.18	0.07	0.002	—	—	—	7	7	3,500.000
14562	examined	indeterminate	1.04	0.96			—	—	—	—	—	—
14581	sampled	moderate	1.30	0.90			3	—	—	12	15	—
14583	sampled	sparse	0.22	0.20	0.06	0.009	3	—	2	9	14	2,800.000
14612	sampled	sparse	0.48	0.31	0.13	0.032	—	—	—	7	7	437.500
14764	sampled	indeterminate	0.50	0.50	0.09	0.018	—	—	1	—	1	111.111
14804	examined	indeterminate	0.51	0.44			—	—	—	—	—	—
14836	examined	indeterminate	0.83	0.62			—	—	—	—	—	—
Middle to Late Archaic Period												
3122	partial	sparse	0.80	0.75	0.13	0.099	—	—	—	—	—	—
3126	partial	moderate	0.30	0.10	0.06	0.017	—	—	—	—	—	—
3144	partial	sparse	0.10	0.10	0.10	0.018	—	—	—	—	—	—
3645	partial	sparse	0.90	0.90	0.05	0.030	—	—	—	—	—	—

continued on next page

Feature No.	Level of Effort	Density of Burned Materials in Fill	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
3654	partial	moderate	0.19	0.16	0.05	0.004	—	—	—	—	—	—
3711	partial	sparse	0.50	0.14	0.07	0.015	1	2	—	—	3	600.000
3715	partial	moderate	0.35	0.25	0.07	0.014	—	—	—	—	—	—
3722	partial	abundant	1.84	1.43	0.18	0.351	5	13	—	124	142	1,014.286
3728	complete	abundant	1.92	1.18	0.14	0.204	2	3	2	—	7	85.366
3991	partial	moderate	0.77	0.77	0.10	0.020	1	3	3	—	7	437.500
4264	partial	moderate	0.23	0.21	0.02	0.008	—	—	—	—	—	—
4267	examined	indeterminate	0.40	0.40			—	—	—	—	—	—
11427	partial	moderate	1.09	0.90	0.11	0.100	—	2	—	27	29	580.000
13016	partial	sparse	0.69	0.68	0.16	0.056	—	—	—	2	2	71.429
13020	sampled	sparse	0.72	0.56	0.01	0.003	—	—	—	18	18	9,000.000
14672	sampled	moderate	1.34	0.90	0.08	0.138	1	2	1	16	20	289.855
15073	sampled	indeterminate	0.60	0.55	0.04	0.017	—	1	—	—	1	111.111
15075	sampled	moderate	0.60	0.60	0.13	0.055	—	4	—	—	4	148.148
Middle Archaic to Pioneer Period												
3224	partial	moderate	2.20	1.51	0.35	0.868	2	1	2	—	5	11.521
3285	partial	abundant	1.08	0.90	0.16	0.125	—	5	—	1	6	96.774
4603	complete	moderate	0.60	0.60			1	14	1	12	28	—
4656	partial	moderate	1.00	0.93	0.07	0.045	—	1	—	—	1	45.455
7724	complete	moderate	0.63	0.32	0.09	0.009	—	—	—	—	—	—
8449	complete	moderate	0.70	0.50	0.19	0.063	—	4	—	5	9	142.857
9745	complete	moderate	0.33	0.25	0.07	0.008	—	5	—	1	6	750.000
11356	partial	moderate	0.69	0.68	0.09	0.035	—	—	—	41	41	2,277.778
14632	complete	nonexistent	4.80	2.75	0.04	0.307	—	—	—	75	75	244.300
18111	sampled	abundant	0.84	0.84	0.06	0.035	2	9	—	31	42	2,470.588
Middle Archaic to Protohistoric Period												
4600	complete	abundant	0.82	0.76	0.18	0.056	1	14	—	93	108	1,928.571
4607	partial	sparse	0.60	0.51	0.21	0.097	—	—	—	—	—	—
4628	complete	abundant	0.40	0.40	0.13	0.008	2	3	3	—	8	1,000.000
10655	partial	moderate	1.07	0.64	0.15	0.036	5	—	2	19	26	1,444.444
10703	partial	sparse	2.00	1.80	0.30	0.609	1	3	1	101	106	434.426
11319	partial	abundant	0.40	0.35	0.16	0.054	—	—	—	30	30	1,111.111
Late Archaic to Pioneer Period												
13031	sampled	moderate	0.30	0.30	0.05	0.004	2	—	3	9	14	7,000.000
13037	sampled	sparse	0.45	0.38	0.09	0.030	—	—	—	8	8	533.333
15024	sampled	sparse	0.70	0.60	0.10	0.033	—	—	—	4	4	235.294
15144	sampled	sparse	0.48	0.24	0.10	0.033	—	—	—	7	7	411.765
15354	examined	indeterminate	1.14	0.95			—	—	—	—	—	—

Feature No.	Level of Effort	Density of Burned Materials in Fill	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
Late Archaic to Protohistoric Period												
1420	partial	sparse	0.60	0.60	0.09	0.022	1	—	—	1	2	181.818
3510	partial	moderate	0.42	0.30	0.10	0.031	—	2	—	—	2	125.000
3800	partial	moderate	0.35	0.15	0.08	0.018	2	—	—	—	2	125.000
10593	sampled	sparse	0.88	0.82	0.60	0.534	—	—	—	—	—	—
10594	sampled	sparse	0.68	0.54	0.13	0.069	—	—	—	—	—	—
10614	sampled	sparse	1.45	1.40	0.12	0.131	—	—	1	70	71	1,092.308
10805	sampled	sparse	0.47	0.46	0.08	0.021	—	—	—	13	13	1,300.000
Late Cienega to Red Mountain Phase												
2485	sampled	moderate	3.250	2.200	0.09	0.644	—	—	—	—	—	—
10665	sampled	sparse	0.400	0.380	0.03	0.005	—	—	—	—	—	—
10666	partial	sparse	0.985	0.685			—	—	—	3	3	—
10773	sampled	moderate	0.440	0.350	0.09	0.018	—	—	1	9	10	1,111.111
14646	sampled	abundant	0.56	0.33	0.09	0.023	1	1	—	7	9	750.000
14649	sampled	abundant	4.05	2.55	0.14	1.029	1	—	—	2	3	2.915
14919	sampled	sparse	0.40	0.35	0.14	0.046	—	—	—	—	—	—
14920	sampled	sparse	0.94	0.80	0.06	0.030	6	2	1	7	16	1,066.667
18664	examined	indeterminate	0.44	0.26			—	—	—	—	—	—
18665	examined	indeterminate	0.75	0.50			—	—	—	—	—	—
19041	sampled	sparse	0.55	0.55	0.03	0.005	—	—	—	6	6	2,000.000
Early Ceramic to Protohistoric Period												
10687	partial	sparse	0.25	0.20	0.07	0.016	2	—	—	2	4	666.667
10817	sampled	moderate	0.68	0.49	0.09	0.036	—	—	—	—	—	—
14661	sampled	moderate	0.70	0.65	0.04	0.021	1	—	—	5	6	600.000
Pioneer to Classic Period												
3234	partial	sparse	1.01	0.97	0.21	0.141	—	1	—	—	1	14.286
3326	partial	moderate	0.25	0.22	0.03	0.002	5	1	—	—	6	6,000.000
3331	examined	indeterminate	0.59	0.53			—	—	—	—	—	—
3336	partial	abundant	2.02	2.00	0.22	0.484	1	1	—	21	23	95.041
11062	partial	sparse	0.15	0.12	0.04	0.011	—	—	—	3	3	600.000
14837	sampled	sparse	2.50	2.30	0.16	0.398	—	—	—	—	—	—
14864	sampled	indeterminate	0.50	0.20	0.18	0.032	—	1	—	1	2	125.000
14866	sampled	sparse	0.35	0.24	0.20	0.072	—	—	—	—	—	—

continued on next page

Feature No.	Level of Effort	Density of Burned Materials in Fill	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Faunal Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Total Artifacts (n)	Artifact Density (n/m^3)[a]
Classic to Protohistoric Period												
4625	complete	moderate	1.08	1.00	0.19	0.124	10	3	5	12	30	241.935
14690	sampled	sparse	0.30	0.25	0.15	0.039	—	—	—	2	2	100.000
Post–Middle Archaic Period												
11348	partial	moderate	0.34	0.34	0.08	0.026	—	—	—	—	—	—
Post–Late Archaic Period												
2005	examined	indeterminate	3.00	3.00			—	—	—	—	—	—
2009	examined	indeterminate	3.50	2.00			1	—	—	—	1	—
3065	examined	indeterminate	0.73	0.64			—	—	—	—	—	—
3067	partial	sparse	0.80	0.70	0.05	0.039	—	—	—	—	—	—
3071	partial	sparse	0.40	0.30	0.03	0.002	1	1	—	—	2	2,000.000
3753	partial	moderate	1.21	1.15	0.14	0.120	—	1	—	—	1	16.667
3766	partial	sparse	0.42	0.37	0.17	0.017	—	—	—	—	—	—
Post–Soho Phase												
2007	examined	indeterminate	4.00	2.00			—	—	—	—	—	—
2008	examined	indeterminate	4.00	3.00			—	—	—	—	—	—
2010	partial		2.50	2.50			6	1	1	—	8	—
2457	examined	indeterminate	1.70	1.70			—	—	—	—	—	—
Post–Early Historical Period												
2003	examined	indeterminate	10.93	9.60			—	—	—	—	—	—
2004	examined	indeterminate	9.70	7.51			—	—	—	—	—	—
2006	examined	indeterminate	4.00	4.00			—	—	—	—	—	—

[a] Artifact-density calculations are based on level of effort; therefore, partially excavated features have artifact densities based on the percentages of the features excavated.

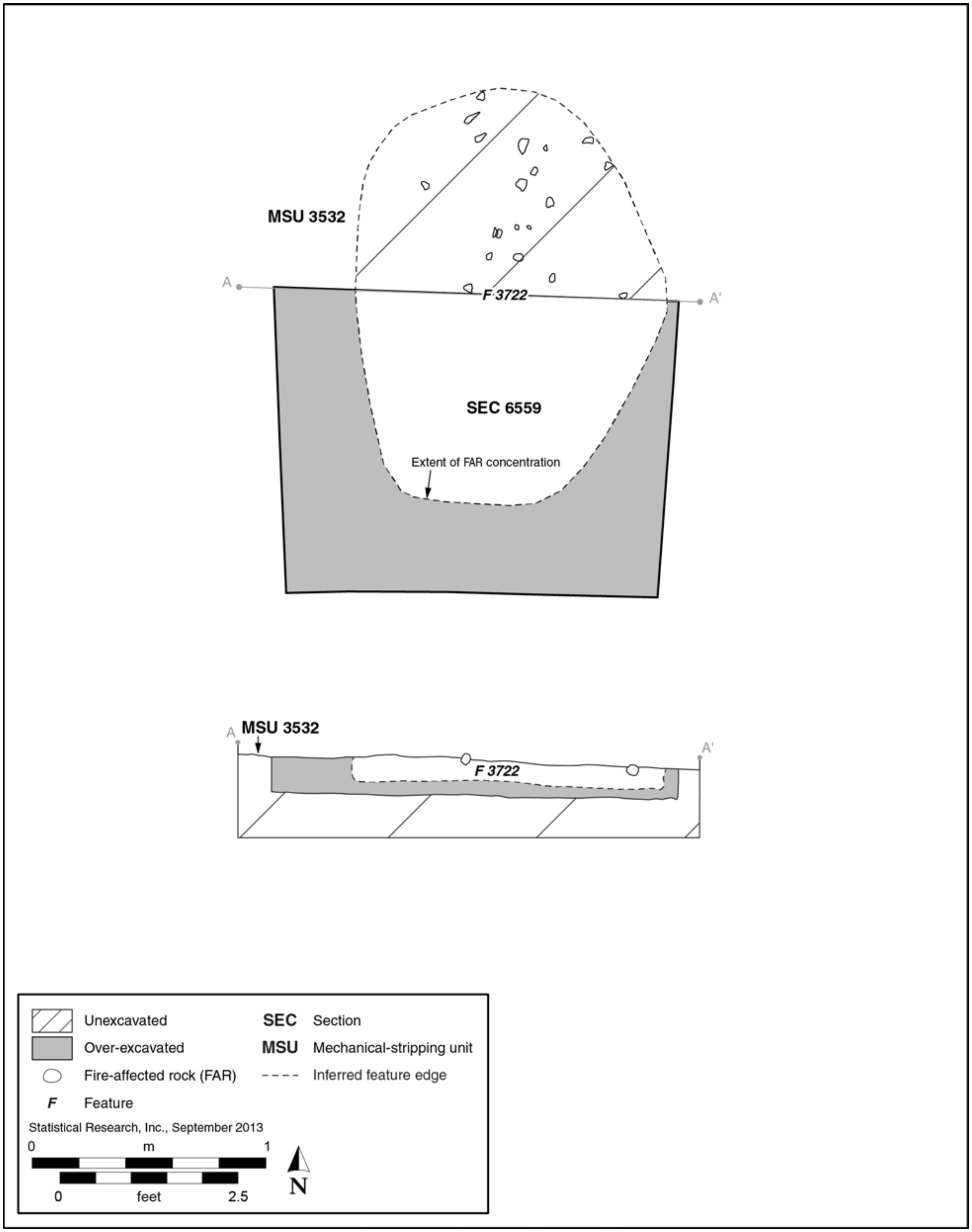

Figure 201. Mid-excavation plan view and cross section of Feature 3722 (a FAR concentration) at Falcon Landing.

Figure 202. Mid-excavation photograph of Feature 3722 (a FAR concentration) at Falcon Landing, view to the north.

Geochronologic Analysis

Feature 3722 was located within Unit IIs/sf. The bracketing age range for Unit IIs/sf is ca. 2540–790 cal. B.C. (see Chapter 2, Volume 2), placing the feature in the Middle to Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

The FAR associated with Feature 3722 was likely discarded on the aboriginal surface of the site in one event. No pit was identified with the FAR. The FAR concentration was later covered by natural alluvial and aeolian sediments.

Stratigraphic Relationships and Associated Features

Several features were spatially associated with Feature 3722, including four nonthermal pits (Features 3718, 3723, 3725, and 3726) and two FAR concentrations (Features 3711 and 3728) (see Appendix A). These features all share the same stratigraphic position as Feature 3722 and therefore date to the Middle to Late Archaic period.

Middle Archaic to Protohistoric Period Component

Feature 4600

Feature type: FAR concentration
Age: Middle Archaic to Protohistoric period
Locus: Area A
Grid location: J4
Level of effort: complete
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 0.82
Width (m): 0.76
Excavated depth (m): 0.18
Volume (m^3): 0.110

Excavation Methods

Feature 4600 was an FAR concentration located in the northwestern portion of Area A (see Appendix A). It was originally identified during mechanical excavations of MSU 4580. The feature was excavated in two sections; the southern half was excavated as SEC 9477, and the northern half was excavated as SEC 9498 (Figure 203). Both sections were over-excavated in an attempt to find an associated pit, but a pit was not found, and Feature 4600 was interpreted as an FAR concentration (Figure 204).

Feature Fill

The sediment surrounding Feature 4600 consisted of a very soft, loose, light yellowish brown silt loam with some fine to medium sand. Occasional small charcoal flecks were also present. Minor amounts of rodent

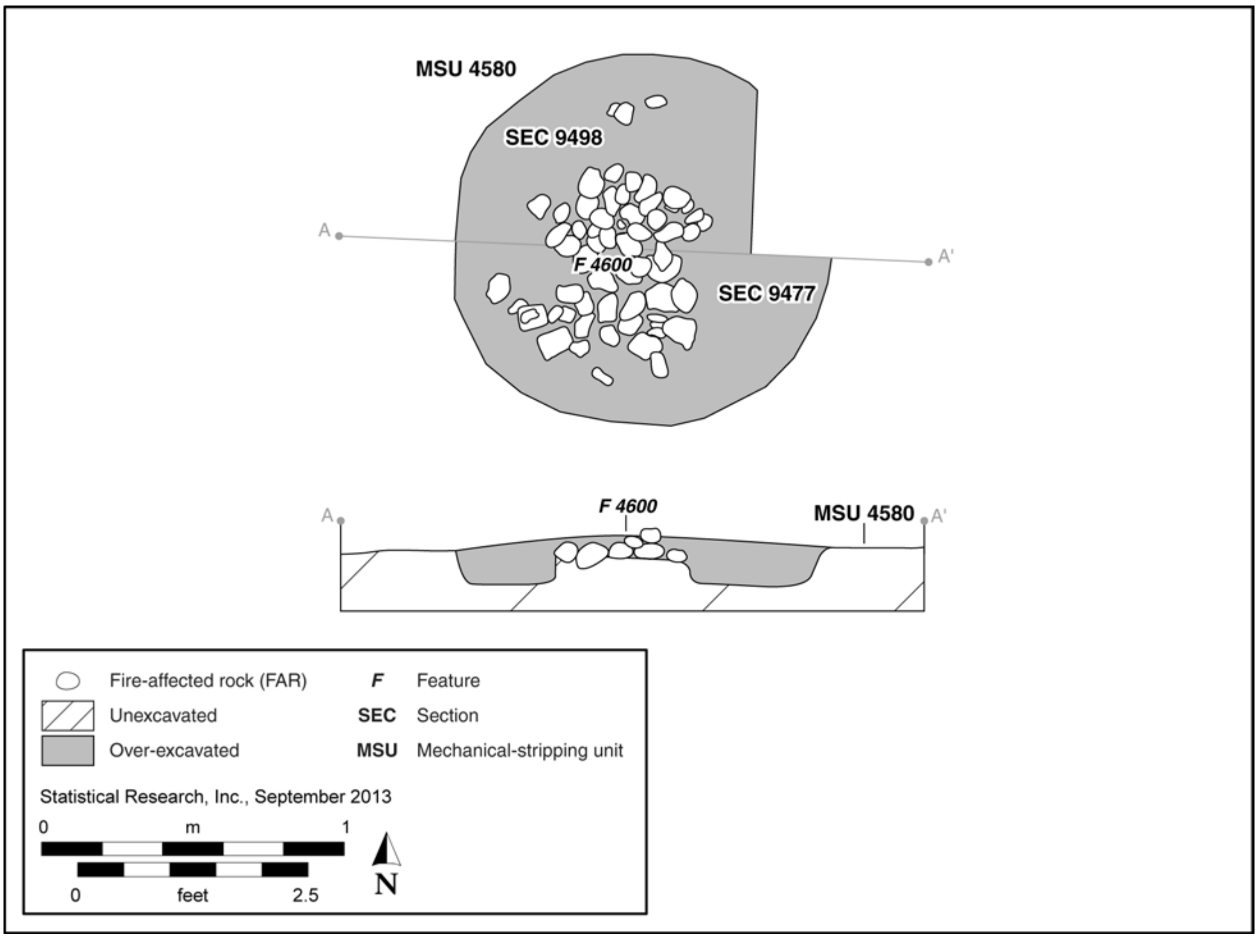

Figure 203. Post-excavation plan view and cross section of Feature 4600 (a FAR concentration) at Falcon Landing.

Figure 204. Post-excavation photograph of Feature 4600 (a FAR concentration) at Falcon Landing, view to the north.

disturbance and rootlets were noted in the upper part of the feature. The FAR associated with Feature 4600 rested on harder, slightly blocky natural sediments. Feature 4600 consisted of 93 pieces of FAR. Among the FAR were 8 fire-affected mano fragments, 1 fire-affected metate fragment, 5 fire-affected indeterminate ground stone fragments, and 1 hammerstone fragment.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 4600 was located at the surface of Unit IIA, with latest Holocene or Historical period alluvial-fan deposits (Unit V) overlying it. The unconformity between the surface of Unit IIA and Unit V provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), placing the feature in the Middle Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
The FAR associated with Feature 4600 was likely discarded on the aboriginal surface of the site in one event. No pit was identified with the FAR. The FAR concentration was later covered by natural alluvial and aeolian sediments.

Stratigraphic Relationships and Associated Features

Several features were stratigraphically associated with Feature 4600, including three nonthermal pits (Features 4599, 4611, and 4616), a thermal pit (Features 4606), one FAR concentration (Feature 4607), and a surface structure (Feature 4621) (see Appendix A).

Human Burials

A single human burial was identified at Falcon Landing, dated to the Late Archaic to Pioneer period.

Burial Feature 3139

Burial type: secondary inhumation
Age designation: adult
Length (m): 1.90
Width (m): 0.75
Burial-pit depth (m): 0.33

Burial-pit orientation: north–south
Burial orientation: indeterminate
Age: 18+ years
Sex: probable male

Excavation Methods

Fragmented human bone was encountered during mechanical stripping of MSU 3118 (see Appendix A). Mechanical excavations were immediately halted, the human remains were protected with natural cloth, and LAFB was contacted. Manual excavation began only after consultation between LAFB and the involved Native American tribes was completed. The bone was encountered near a pit containing FAR that was initially believed to be intruding upon the burial. As excavation progressed, it was discovered that the pit containing FAR was part of, and not intrusive to, the burial feature.

The burial pit was excavated in two sections to define the horizontal boundaries of the pit (Figure 205). The northern section (SEC 7226) contained all of the human bone associated with this feature. Five fragments or clusters of fragments were point-located in that section. SEC 7226 was excavated in two levels. Level 1 extended to a depth of approximately 30 cm and contained the five point-located bone clusters mentioned above as well as approximately five pieces of FAR. All fill from this level was screened through 1/8-inch mesh. Level 2 was initiated when excavators observed a possible pit outline below the level of the other remains. Nine small cranial fragments were found 3–4 cm below the previously discovered remains, but no additional pit was observed. The second level was excavated to a depth of approximately 20 cm, until no more human bone was encountered. The fill from this level was also screened through 1/8-inch mesh.

The southern section of the feature was excavated as SEC 7228 in a single level, to determine the presence or absence of human bone. No human remains were encountered during this excavation, but the section did include FAR, as had been originally identified in association with the remains. The section was excavated in a single level approximately 20 cm thick. All fill from this level was screen through 1/8-inch mesh.

Burial Pit

The burial pit was subrectangular in plan view and basin shaped in cross section (see Figure 205). The pit followed a roughly north–south orientation and measured 1.9 m in length, 0.75 m in width, and 0.33 m in depth. The pit boundaries were somewhat ephemeral and exhibited no evidence of burning.

Burial Fill

The burial fill was a brown silty loam with small, subrounded gravels. Calcium-carbonate development consisted of blebs approximately 1 cm each in thickness. The top 20 cm contained several fire-affected cobbles, mostly in the southern portion of the pit. The lower 15 cm of the pit contained human cranial fragments, all in the northern portion of the pit (SEC 7226). A small number of charcoal flecks was noted in the lower deposits, but no evidence of in situ burning was observed.

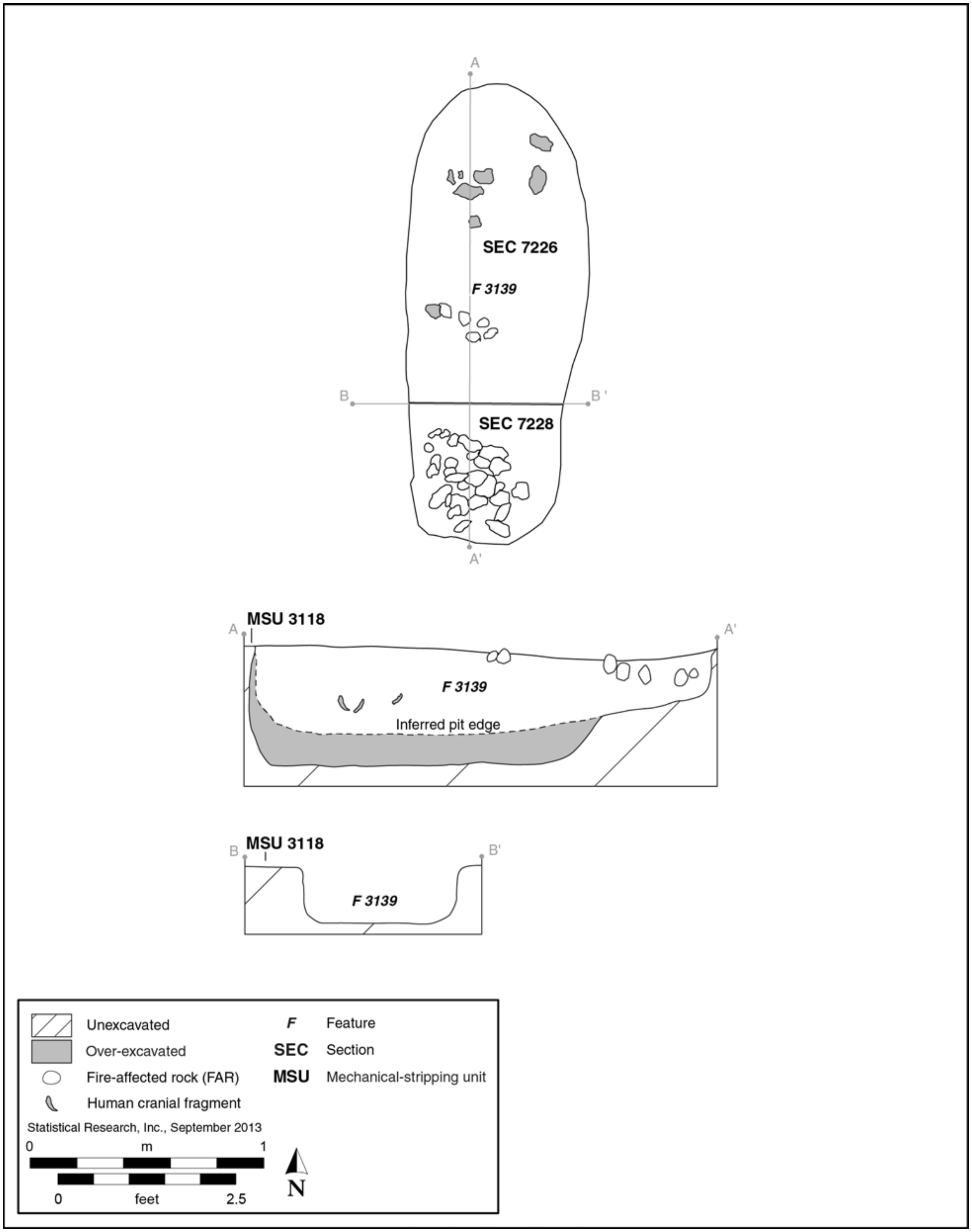

Figure 205. Plan view and profiles of Feature 3139 (a secondary inhumation) at Falcon Landing. Profile A–A is the north–south profile of the feature after the excavation of Section 7226. Profile B is the east–west cross section of the pit after excavation.

Burial Treatment

The human remains associated with this feature consisted of fragmentary cranial elements only. The placement of identifiable fragments was not consistent with an anatomical position. No elements were in articulation, and the distribution of fragments provided no indication of the original placement or orientation of the cranium. No burial artifacts were encountered, but 1 chert biface flake and 32 pieces of FAR were discovered near the middle and southern portions of the feature. The purpose of the FAR was not immediately clear; there was no evidence of in situ burning. All of the FAR was encountered above the human remains and may have served as a cap or grave marker. The bone exhibited slight charring and blackening in cross section, which is inconsistent with intentional cremation as a mortuary behavior. Thus, the burial type was determined to be a secondary inhumation. The biological attributes of the human remains and the mortuary practices observed will be discussed in Chapter 8, Volume 2 of this series.

Associated Artifacts

One artifact was associated with this burial: a chert biface flake.

Stratigraphic Relationships and Associated Features

No features intruded upon Feature 3139, and it did not intrude upon any other feature. Feature 3139 was located at the surface of Unit III1, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the surface of Unit III1 and Unit IV provides a geochronologic date of ca. 920 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), placing the feature in the Late Archaic to Pioneer period. Two features were encountered near Feature 3139 (see Appendix A): Feature 3130, a nonthermal pit 1.1 m to the south, and Feature 3137, a nonthermal pit 2.1 m to the east. Both of these features were examined only, and neither feature produced any artifacts. They appeared to be unrelated to burial Feature 3139.

Middens

In total, four middens were originally identified at Falcon Landing. Middens are defined as an accumulations of sediments containing cultural materials, such as charcoal, ash, and artifacts, that have been deposited through human action. Two of the middens identified at Falcon Landing (Features 10118 and 10951) were large areas, ca. 250 m^2 in plan view and between 0.4 and 0.6 m in depth. Both Features 10118 and 10951 contained ash and charcoal but relatively few artifacts. Further investigation and excavation of these features revealed that they were, in fact, natural deposits intermixed with cultural materials. The other two middens identified at Falcon Landing (Features 3256 and 14587) were much smaller, ca. 25 and 64 m^2 respectively, and were less than 0.2 m in depth. Further excavation of Features 3256 and 14587 resulted in their interpretation as sheet middens (Table 76). Sheet middens are defined as thin deposits of cultural materials deposited on the aboriginal ground surface and therefore lacking significant depth or stratification. The following are descriptions of the four features originally interpreted as middens, as well as explanations as to why the two large middens (Features 10118 and 10951) are now considered natural phenomena.

Chiricahua Phase Component

Feature 10951

Feature type: natural deposit
Age: Chiricahua phase
Locus: Area A
Grid location: J3
Level of effort: partial
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 21.50
Width (m): 11.50
Excavated depth (m): 0.38
Volume (m^3): 93.960

Table 76. Middens at Falcon Landing, by Chronologic Group

Feature No.	Level of Effort	Length (m)	Width (m)	Depth (m)	Volume (m^3)	Flaked Stone Artifacts	Ground Stone Artifacts	Expedient-Use Artifacts (FAR and Manuports)	Faunal Artifacts	Total Artifacts (n)	Artifact Density (n/m^3)[a]
Chiricahua Phase											
14587	partial	8.50	7.50	0.19	6.318	80	4	318	14	416	131.687
San Pedro Phase											
3256	partial	6.20	4.00	0.12	3.031	19	2	—	12	33	21.768

[a] Artifact-density calculations are based on level of effort; therefore, partially excavated features have artifact densities based on the percentages of the features excavated.

Excavation Methods
Feature 10951 was located in the northwestern corner of Area A, along the western edge of the APE (see Appendix A). It was originally identified during mechanical stripping and was believed to be a large structure characterized as an irregularly shaped, charcoal-rich stain. Initially, a 1-by-2-m test unit (TP 16556) was excavated within the boundary of Feature 10951, in four arbitrary 10-cm levels. The middle of Level 4 reached the base of the charcoal-rich deposit and exposed a possible floor or surface. Excavations were expanded to the north and west of TP 16556 (using SEC 16666) in order to define the possible structure. SEC 16666 measured 3.3 by 2.75 m in size and was excavated in one approximately 30-cm-deep level, to the possible structure floor. The plan-view exposure of the charcoal-rich sediments in SEC 16666 revealed extensive rodent disturbances but no cultural surface.

Several other extramural features surrounding Feature 10951 were excavated concurrently. These included Features 10901, 10902, 10915, 10916, 10923, and 10950. The excavation of these features determined that they were not individual extramural pits but, instead, parts of a larger, charcoal-rich deposit similar to and spatially associated with Feature 10951; therefore, the interpretation of each of the above extramural features was changed to noncultural feature. With that revelation, it became clear that Feature 10591 was much more extensive than originally thought.

In order to determine the full extent of Feature 10591, two backhoe trenches (TRs 13836 and 13838) were excavated through the deposit. TR 13836 was oriented north–south and extended about 30 m. TR 13838 was oriented east–west and extended about 20 m. The two trenches crossed in the center. The excavation of the two trenches allowed a more thorough examination of the charcoal-rich deposit in profile. The charcoal-rich sediments associated with Feature 10951 included numerous finely bedded silt and sand lenses. Additionally, several extramural-pit features were identified in the profile of the two trenches. In order to uncover the newly identified extramural pits exposed in trench walls, arbitrary units were excavated along the edges of the trenches, through the fill of Feature 10951. For example, HSU 19083 was excavated through the Feature 10951 deposit to uncover a thermal pit, Feature 17966. In total, six HSUs (HSUs 19079, 19083, 19513, 19523, 19531, and 19535) and two test units (TPs 18780 and 19501) were excavated through the fill of Feature 10951. These units were all excavated in arbitrary levels through the charcoal deposit to uncover an underlying extramural pit.

Feature Fill
Feature 10951 consisted of naturally deposited, charcoal-rich sediments with laminated fine sands and silts and occasional artifacts. Artifacts recovered from the charcoal-rich sediments included 27 pieces of FAR, 5 pieces of flaked stone debitage, a mano fragment, 2 metate fragments, and 4 freshwater-snail shells. Feature 10951 had a density of 0.37 artifacts per cubic meter.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 10951 was located within Unit IIA. The bracketing age range for Unit IIA is 2810–2420 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase.

Radiocarbon Analysis
Charcoal samples recovered from two extramural features associated with the midden were sent for macrobotanical analysis. Feature 10925 was located stratigraphically above or within the top portion of the charcoal deposit, and Feature 18439 was located stratigraphically below the charcoal deposit. Pieces of charred mesquite (*Prosopis* sp.) wood were submitted to Aeon for AMS analysis from Feature 10925, and a piece of charred ocotillo (*Fouquieria* sp.) wood was submitted from Feature 18439. The charcoal from Feature 10925 produced a date of 2870–2570 cal. B.C., and the charcoal from Feature 18439 produced a date of

2880–2610 cal. B.C. These two dates suggest that the charcoal deposit associated with Feature 10951 was deposited rapidly sometime during the Middle Archaic period.

Abandonment Processes

SRI's geomorphologist inspected Feature 10951 in trench profile and determined it to be a layer of naturally deposited charcoal associated with Unit IIA. The interpretation of this deposit is that it was derived from cultural activity but no longer exists in its primary context. In other words, the charcoal and other cultural materials were discarded by human action, but at some point in the history of the project area, sheetwash eroded them from their primary context and redeposited them into the location currently known as Feature 10951. So, Feature 10951 is considered a noncultural feature, because it represents a secondary deposit.

Stratigraphic Relationships and Associated Features

Features identified within or below the charcoal deposit were excavated, including an activity area (Feature 18782), three thermal pits (Features 10920, 17953, and 17966), six nonthermal pits (Features 17952, 19502, 19520, 19538, 19539, and 19540), and a charcoal lens (Feature 19503).

During site closure, a backhoe was used to remove the charcoal-rich sediments associated with Feature 10951, in order to determine whether any human remains or funerary objects were located below the deposit. In total, 47 features were identified below the charcoal deposit, 14 of which were thermal pits and 33 of which were nonthermal pits (see Appendix A).

Feature 14587

Feature type: sheet midden
Age: Chiricahua phase
Locus: Area A
Grid location: J5
Level of effort: partial
Plan-view shape: irregular
Cross-sectional shape: flat
Length (m): 8.50
Width (m): 7.50
Excavated depth (m): 0.19
Volume (m³): 6.318

Excavation Methods

Feature 14587 was located in the northeastern portion of Area A (see Appendix A). It was discovered in plan view in MSU 14574. Thirteen 1-by-1-m test units were used to excavate Feature 14587: TPs 13934, 13937, 13940, 13943, 13946, 13949, 13952, 13955, 13958, 13961, 13964, 13967, and 17880. The test units were arranged on a north-south-oriented grid and excavated in a checkerboard fashion within the boundary of the feature (Figures 206 and 207). The first test unit (TP 17880) was excavated in two arbitrary 10-cm levels. Two distinct stratums were identified: (1) a midden deposit consisting of the upper 10–15 cm and (2) natural sediments below the midden (see Figure 206). Once the stratigraphic boundary was recognized in TP 17880, each additional test unit was excavated stratigraphically. The fill from each level was screened through ¼-inch mesh, and pollen and flotation samples were collected.

Feature Fill

The midden fill associated with Feature 14587 consisted of a slightly compact, blocky, light yellowish brown silt loam with ash and charcoal staining. The underlying natural sediments consisted of a moderately compact, blocky silt loam with calcium-carbonate blebs (see Figure 206). Artifacts were mainly located in the upper stratum, but some were present in the lower stratum, likely because of the effects of bioturbation. In total, 416 artifacts were recovered from Feature 14587, 49 of which were from the natural stratum (Level 2 of the test units); the remaining 367 artifacts were from the upper midden deposit. Feature 14587 had a density of 131.687 artifacts per cubic meter. Artifacts included 318 pieces of FAR, 78 pieces of flaked stone debitage, 14 pieces of faunal bone, 2 flaked stone tools, 1 mano, and 3 pieces of indeterminate ground stone. Of these, 2 pieces of flaked stone debitage (PD 13975), an edge-modified flake (PD 13973), and a mano fragment (PD 13974) were point-located (see Figure 206).

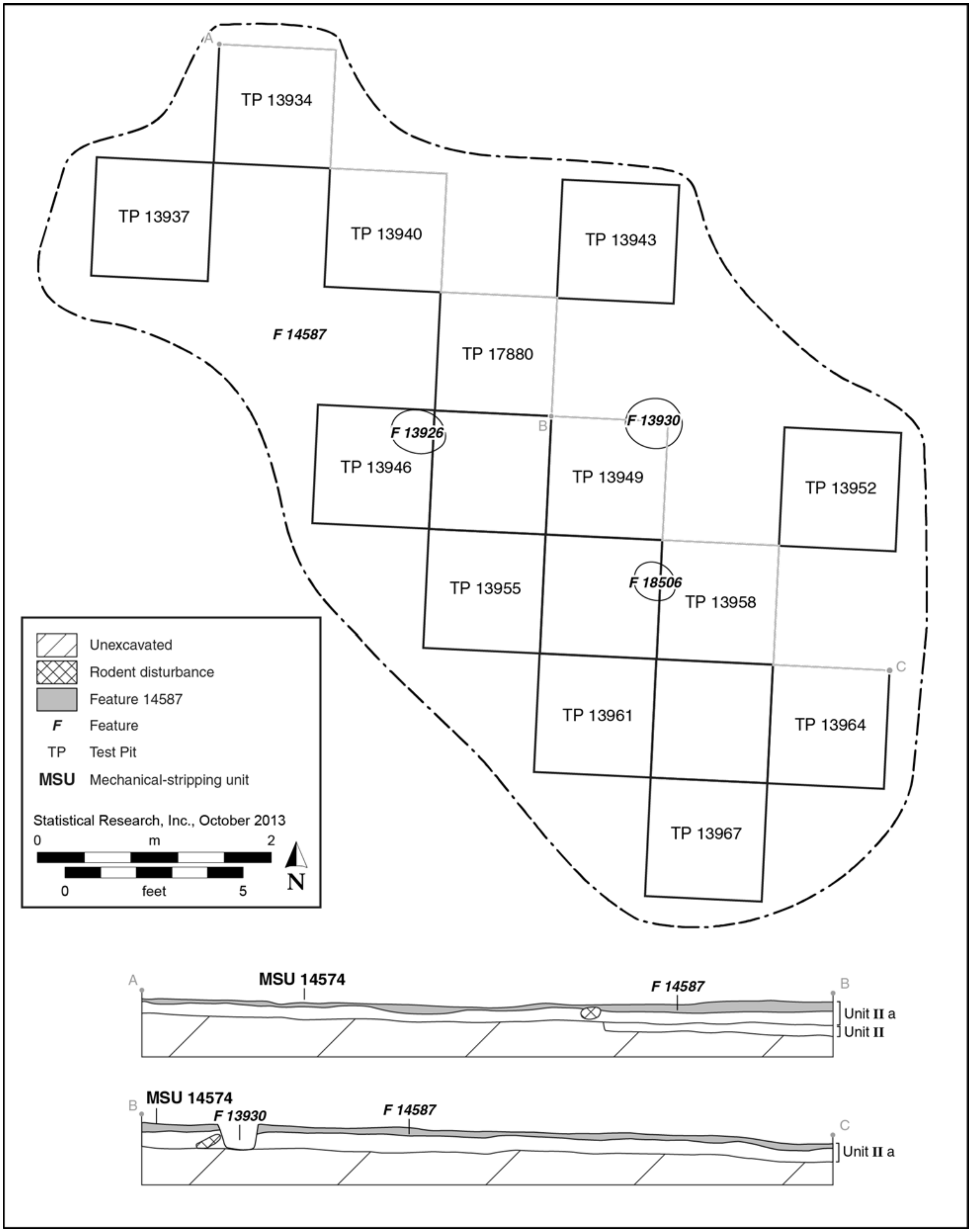

Figure 206. Plan view and cross section of Feature 14587 (a midden) and the 13 test pits used to partially excavate the feature and to determine the depth.

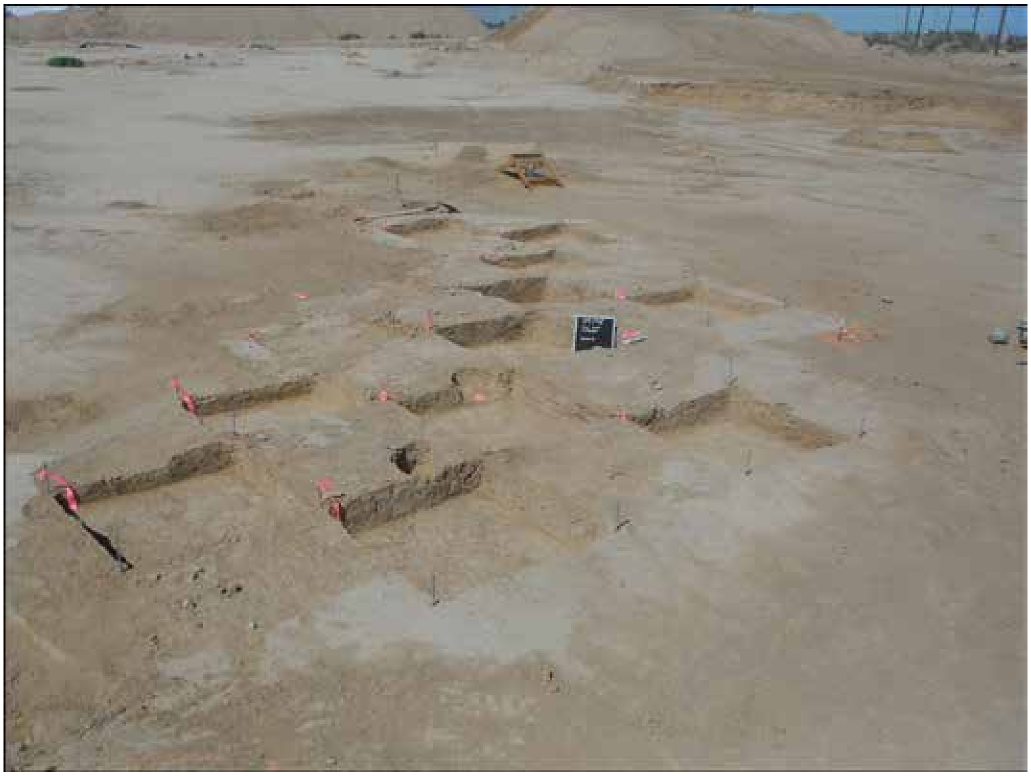

Figure 207. Photograph of the excavation grid in Feature 14587 (a midden) at Falcon Landing, view to the northwest.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 14587 was located within Unit IIA. The bracketing age range for Unit IIA is ca. 2810–2420 cal. B.C. (see Chapter 2, Volume 2), placing this feature in the Chiricahua phase of the Middle Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The sediments associated with Feature 14587 represent the deposition of cultural materials, including artifacts, ash, charcoal, and numerous pieces of FAR. It is likely that the sediments associated with Feature 14587 were deposited on the aboriginal surface in a low-lying area. The shallow depth of the sediments suggests that the materials were deposited over a short period of time. Once the sheet midden was abandoned, natural alluvial deposits covered the feature.

Stratigraphic Relationships and Associated Features
Feature 14587 originated within Unit IIA. Three nonthermal pits (Features 13926, 13930, and 18506) were intrusive into the sheet-midden deposit. No features were found below the sheet midden. Six extramural features were stratigraphically similar to Feature 14587 and therefore dated to the Chiricahua phase: four nonthermal pits (Features 14580, 14585, 14586, and 14588) and two FAR concentrations (Features 14581 and 14836) (see Appendix A).

San Pedro Phase Component

Feature 3256

Feature type: sheet midden
Age: San Pedro phase
Locus: Area B
Grid location: D5
Level of effort: partial
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 6.20
Width (m): 4.00
Excavated depth (m): 0.12
Volume (m^3): 3.031

Excavation Methods

Feature 3256 was originally identified during mechanical excavations of MSU 3209, in the northeastern corner of Area B (see Appendix A). Two 2-by-2-m test units were used to excavate the midden, and the fill was screened through 1/4-inch mesh. Pollen and flotation samples were collected from each level. The first test unit (TP 8601) was excavated in two arbitrary 10-cm levels. The first level contained cultural fill and artifacts. The second level reached natural (culturally sterile) sediments. The second test unit (TP 8655) was excavated in a single stratigraphic level approximately 10 cm in depth and terminated at the boundary between cultural and natural sediments (Figure 208).

Feature Fill

The fill of Feature 3256 consisted of a dark yellowish brown silt loam. The sediments were slightly compacted, had an ashy consistency, and contained concentrations of charcoal and oxidized sediments. The fill rested on Unit IIA deposits, consisting of a blocky, compact, calcium-carbonate-rich silt loam. Thirty-three artifacts were located within Feature 3256, resulting in a density of 21.768 artifacts per cubic meter. Artifacts included 18 pieces of flaked stone debitage, 12 pieces of faunal bone, 1 mano fragment, an indeterminate ground stone fragment, and a San Pedro–style projectile point.

Chronometric Data

Diagnostic Material Culture

A San Pedro projectile point was identified in Level 1 of TP 8655 (see Chapter 3, Volume 2). San Pedro points were produced from ca. 1500 B.C. to A.D. 500 (Sliva 2009), corresponding to the Late Archaic period.

Geochronologic Analysis

Feature 3256 was located at the surface of Unit IIA, with late Holocene alluvial-fan deposits (Unit IV) overlying it. The unconformity between the surface of Unit IIA and Unit IV provides a geochronologic date of ca. 2400 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of charred mesquite (*Prosopis* sp.) wood was collected from TP 8655 and submitted to Aeon for AMS dating. The charcoal produced a 2σ date of 1200–930 cal. B.C., corresponding to the San Pedro phase of the Late Archaic period (see Chapter 2, Volume 2) and corroborating the age established from the San Pedro projectile point.

Abandonment Processes

The sediments associated with Feature 3256 represented the deposition of cultural materials, including artifacts, ash, charcoal, and oxidized sediments. It is likely that the sediments associated with Feature 3256 were deposited on the aboriginal surface in a low-lying area. The shallow depth of the sediments suggests that the material was deposited over a short period of time. Once the sheet midden was abandoned, the feature was covered by alluvial sediments.

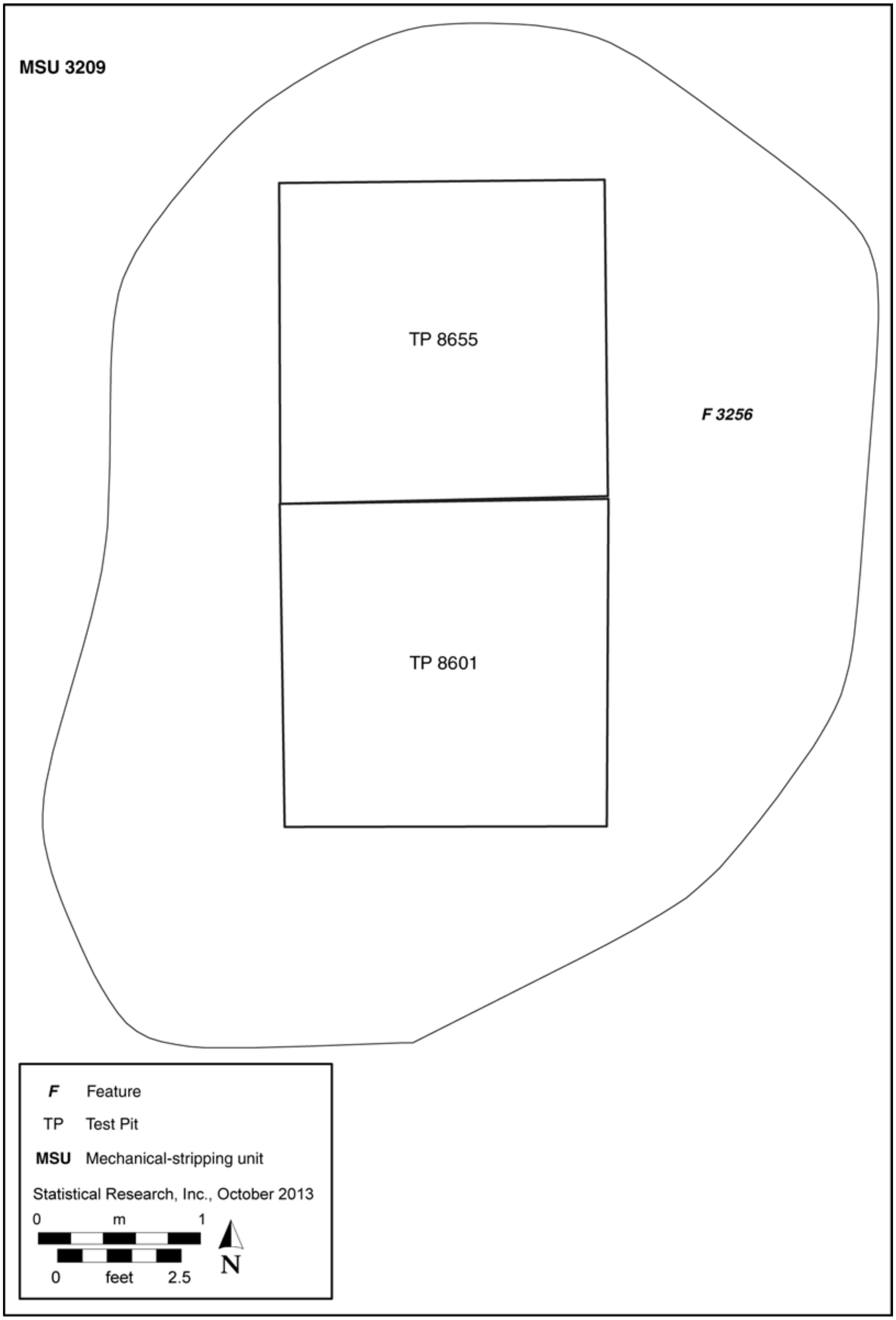

Figure 208. Plan view of Feature 3256 (a midden) and TPs 8601 and 8655, which were used to partially excavate the feature and to determine the depth.

Stratigraphic Relationships and Associated Features

No features were intrusive to Feature 3256 or intruded upon by it. Several features were stratigraphically similar to Feature 3256, including four nonthermal pits (Features 3223, 3257, 3270, and 3274) and one FAR concentration (Feature 3224). Other nearby features dating to the Chiricahua phase of the Middle Archaic period included one thermal pit (Feature 14963) and four nonthermal pits (Features 3219, 3220, 3221, and 3269) (see Appendix A).

Classic to Protohistoric Period Component

Feature 10118

Feature type: natural deposit
Age: Classic to Protohistoric period
Locus: Area B
Grid location: D1
Level of effort: partial
Plan-view shape: irregular
Cross-sectional shape: lenticular
Length (m): 18.20
Width (m): 13.70
Excavated depth (m): 0.60
Volume (m^3): 149.600

Excavation Methods

Feature 10118 was located along the western boundary of Falcon Landing, in Area B (see Appendix A). It was originally identified during the intersite-testing phase in TR 10023 as a large, ashy stain approximately 10 cm below the modern ground surface. Feature 10118 was then further defined in plan view during Phase 2 data recovery, using a backhoe. Once exposed in plan view, an excavation block was placed over the ashy stain, oriented on a north–south grid. Eleven 2-by-2-m test units were excavated in Feature 10118. Six units (TPs 1692, 1706, 1722, 1906, 1909, and 1911) were oriented north–south along the western edge of the ashy deposit, and five units (TPs 1696, 1700, 1712, 1730, and 1907) were oriented east–west, extending east across the ashy deposit and creating a T-shaped excavation block (Figure 209). Each 2-by-2-m test unit was excavated in arbitrary 10-cm levels. Sediments from each level were screened through 1/4-inch mesh, and flotation and pollen samples were collected. In order to ensure precise and consistent excavations within each test unit, a laser level was used to measure the depth of each level. Level 1 was excavated 112–122 cm below laser level, Level 2 was excavated 122–132 cm below laser level, and so on. The base of the ashy deposit was identified at approximately 162 cm below laser level, for a total depth of about 0.6 m. Once the 11 test units had been excavated to natural deposits, a scaled plan view and profile of the block excavation were drawn.

Feature Fill

The fill of Feature 10118 consisted of an ashy, yellowish brown silt loam with occasional artifacts. Underlying the ashy deposit were the natural sediments, which consisted of a light brown silt loam with moderate calcium-carbonate development. During the time of fieldwork, this ashy deposit was considered a midden; therefore, sediments containing ash were considered midden deposits. The levels assigned to mixed sediments were those excavated in natural sediments or those with both natural and ashy sediments. As stated above, the test-unit levels were not excavated stratigraphically; therefore, each level was assigned to either midden deposits or mixed deposits, depending on the context. In general, Levels 1–4 were associated with the ashy (midden) deposit, and Levels 5 and 6 were associated with mixed deposits. In total, 66 artifacts were assigned to midden deposits, and 54 artifacts were assigned to mixed deposits. Midden-associated artifacts included 41 pieces of faunal bone, 19 pieces of flaked stone debitage, 5 pieces of FAR, and 1 flaked stone tool. Artifacts from mixed contexts included 26 pieces of faunal bone, 21 pieces of flaked stone debitage, 4 flaked stone tools, 1 mano fragment, and 2 freshwater-snail shells. Considering only artifacts associated with the midden, Feature 10118 had a density of 0.44 artifacts per cubic meter. Considering both midden and mixed contexts, Feature 10118 had a density of 0.78 artifacts per cubic meter. In addition to prehistoric artifacts, the midden deposit also contained modern trash, such as plastic, glass, and metal (not collected). In TP 1906, a very large, burned mesquite stump was uncovered a few centimeters into Level 1 and was likely the source of the ashy sediments associated with the midden deposit.

Figure 209. Photograph of the excavation block over Feature 10118 (eventually deemed a natural deposit) at Falcon Landing, view to the west.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 10118 was located at the surface of Unit IV, with latest Holocene or Historical period alluvial-fan deposits (Unit V) overlying it. The unconformity between the surface of Unit IV and Unit V provides a geochronologic date of ca. cal. A.D. 1220–1520 (see Chapter 2, Volume 2), corresponding to the Classic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
The sediments associated with the ashy deposit were likely noncultural. The overall low artifact density, the presence of modern trash, and the large, burned mesquite stump suggest that the ashy deposit was actually an extensive, natural tree burn. Artifacts associated with the ashy deposit may have been present in the natural sediments or may have been carried into the deposit through natural processes.

Stratigraphic Relationships and Associated Features
Feature 10118 was located at the surface of Unit IV, and no features intruded upon it. Four nonthermal pits (Features 14911, 14912, 14913, and 14914) were located below Feature 10118. During site closure, the sediments associated with Feature 10118 were mechanically removed, to examine the midden for the presence

of burials. The four nonthermal pits were identified below the Feature 10118 sediments. Three other features were located in proximity to Feature 10118: two nonthermal pits (Features 1628 and 14917) and an FAR concentration (Feature 14919). These three features were stratigraphically lower than Feature 10118 but were not directly below the midden deposit (see Appendix A).

Reservoir

By far, the largest pit feature identified at Falcon Landing was Feature 10278. Located in the east-central portion of Area A, Feature 10278 was situated at the surface of Unit I, with Unit III2/Unit IV alluvial-fan deposits overlying it. The fill of Feature 10278 contained complex stratigraphy with alternating lenses of sand, silt, and clay. The relative size, internal stratigraphy, and location of Feature 10278 suggest that it functioned as a possible water-catchment feature or small reservoir. With a volume of 2.64 m^3, Feature 10278 is +40σ above the mean volume ($\chi = 0.044$ m^3) for the nonthermal basin-shaped pits analyzed in the sample described above. A volume of 2.64 m^3 is also equivalent to approximately 700 gallons; however, this calculation assumes the maximum possible volume, and Feature 10278 likely held less water at any given time. Previous investigations of prehistoric reservoirs (Bayman 1993; Ciolek-Torrello and Nials 1987; Dart 1983; Raab 1975) have demonstrated that large Hohokam reservoirs were not uncommon in southern Arizona. Bayman et al. (2004) recently conducted extensive research on a large reservoir in southwestern Arizona and concluded that in some circumstances, Hohokam reservoirs may have provided year-round sources of water. Wegener and Ciolek-Torello (2011:189–190) identified and excavated a reservoir in the western Phoenix Basin that had been constructed during the Red Mountain phase, showing that substantial water-catchment features existed during the Early Ceramic period. Relative to other reservoirs identified in southern Arizona, Feature 10278 was remarkably small; however, it had a radiocarbon date of 1120–940 cal. B.C., placing it much earlier in time than previously identified reservoirs. Other Late Archaic or Early Ceramic period water-catchment features have been reported, such as several wells from along the Gila River, near Phoenix (Wright et al. 2012). As Wright et al. (2012:56) pointed out, well features dating to ca. 1000 B.C. indicate “an indigenous response to resource unpredictability,” such that the investment of constructing a well or small reservoir during the Late Archaic period suggests evidence of increasing diversity of resource exploitation, a response to more arid conditions, or both (see also Wills and Huckell 1994). Bayman et al. (2004) and Wright et al. (2012) also pointed out the ethnographic evidence of successful well and reservoir use by the O’odham people of southern Arizona (see also Haury 1976:152–153). Naturally occurring *charcos*, or small water holes located in drainages, would have been easily expanded to create more-substantial wells or reservoirs in proximity to resource-procurement areas. This circumstance illustrates the author’s interpretation of Feature 10278. Unfortunately, ostracode analysis was not performed on the sediments from Feature 10278, which would have potentially helped confirm or disqualify this feature as a reservoir. The following description provides evidence of a possible reservoir constructed during the San Pedro phase.

Feature 10278

Feature type: possible reservoir
Age: San Pedro phase
Locus: Area A
Grid location: J5
Level of effort: partial
Plan-view shape: irregular
Cross-sectional shape: basin
Length (m): 3.80
Width (m): 2.90
Excavated depth (m): 0.55
Volume (m^3): 2.640

Excavation Methods

Feature 10278 was a possible reservoir located in the east-central portion of Area A (see Appendix A). It was originally identified as a possible structure in both faces of TR 10061 during the intersite-trenching phase, and was further defined in plan view during Phase 2, with MSU 14596. A control unit (TP 14000) was placed in the approximate center of the feature, south of TR 10061 (Figure 210), and was excavated

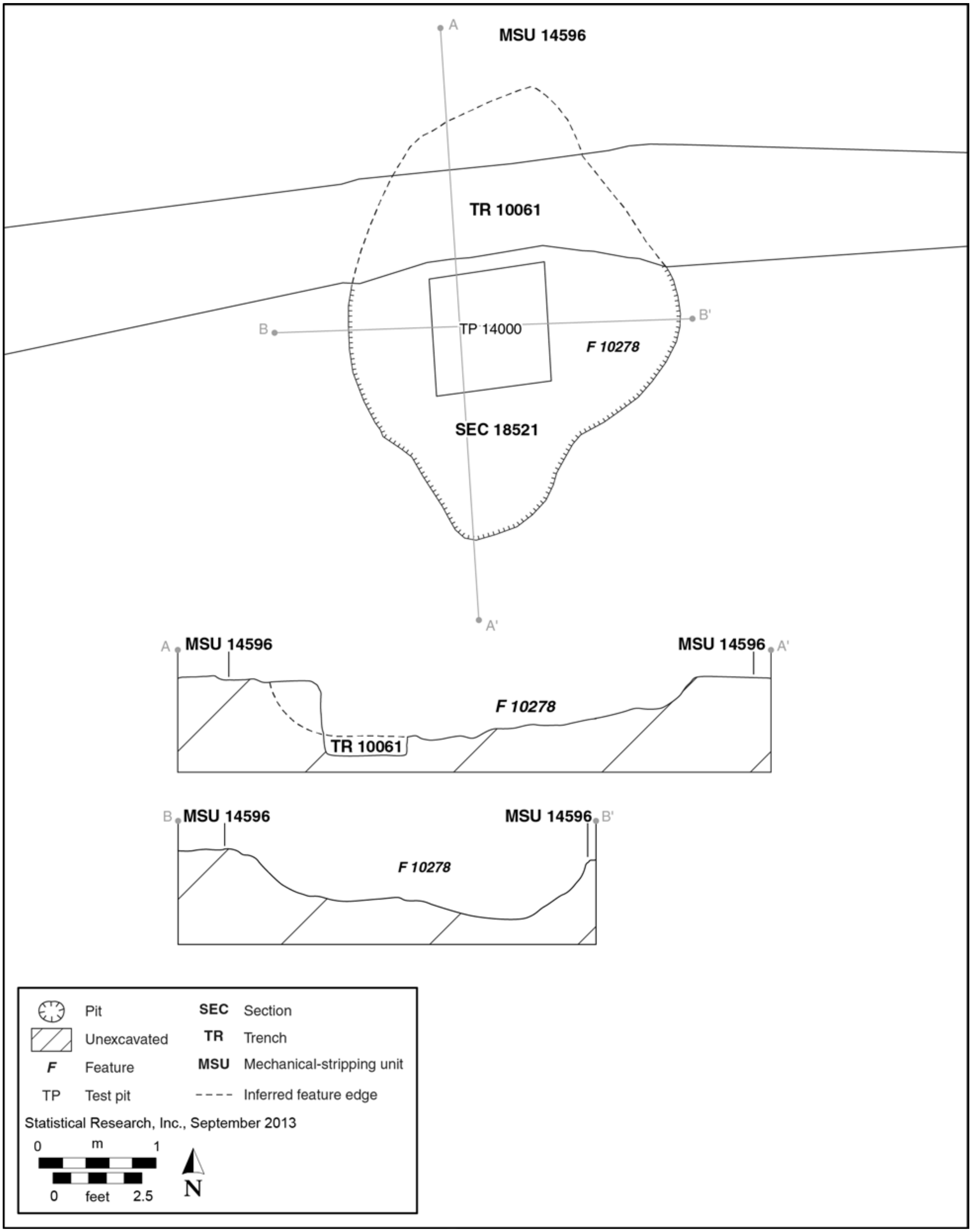

Figure 210. Plan view and cross sections of Feature 10278 (a possible reservoir) at Falcon Landing.

in four arbitrary 10-cm levels; Level 5 uncovered the base of the feature. Once the base of the pit had been identified in TP 14000, the remainder of the feature fill south of TR 10061 was excavated as SEC 18521. The portion of Feature 10278 north of TR 10061 was not excavated, and a profile of the internal stratigraphy was drawn (Figure 211). SEC 18521 was excavated in two levels, to the base of the pit: Level 1 was excavated to an arbitrary depth, and Level 2 ended at the pit base. Sediment samples were collected from Levels 3, 4, and 5 of TP 14000 and were submitted for further analysis. A scaled map and cross section were drawn at the completion of excavation (see Figure 210), and digital photographs were taken (Figure 212).

Feature Fill

Excavation of Feature 10278 revealed complex stratigraphy, suggesting that this pit may have functioned as a water-capturing feature or small reservoir. In general, Feature 10278 contained numerous alternating layers of light brown silty loam and dark brown clay. The individual layers were not specifically defined in the field. The base of the feature had a layer of coarse sand and gravel (see Figure 211). Particle-size sediment analysis was conducted on three sediment samples collected from the profile of Feature 10278 (see Chapter 2, Volume 2). The base of the pit, corresponding to Level 5 of TP 14000, showed a high sand content, indicating that high-energy alluvium was deposited soon after the pit was originally excavated (Table 77). Sediment samples from Levels 3 and 4 of TP 14000 showed very high silt content, indicating the presence of standing water at multiple times during the use of the pit. A moderate amount of charcoal and FAR were also noted in the feature fill. Artifacts recovered from Feature 10278 included six pieces of flaked stone debitage, a piece of faunal bone, and one projectile point.

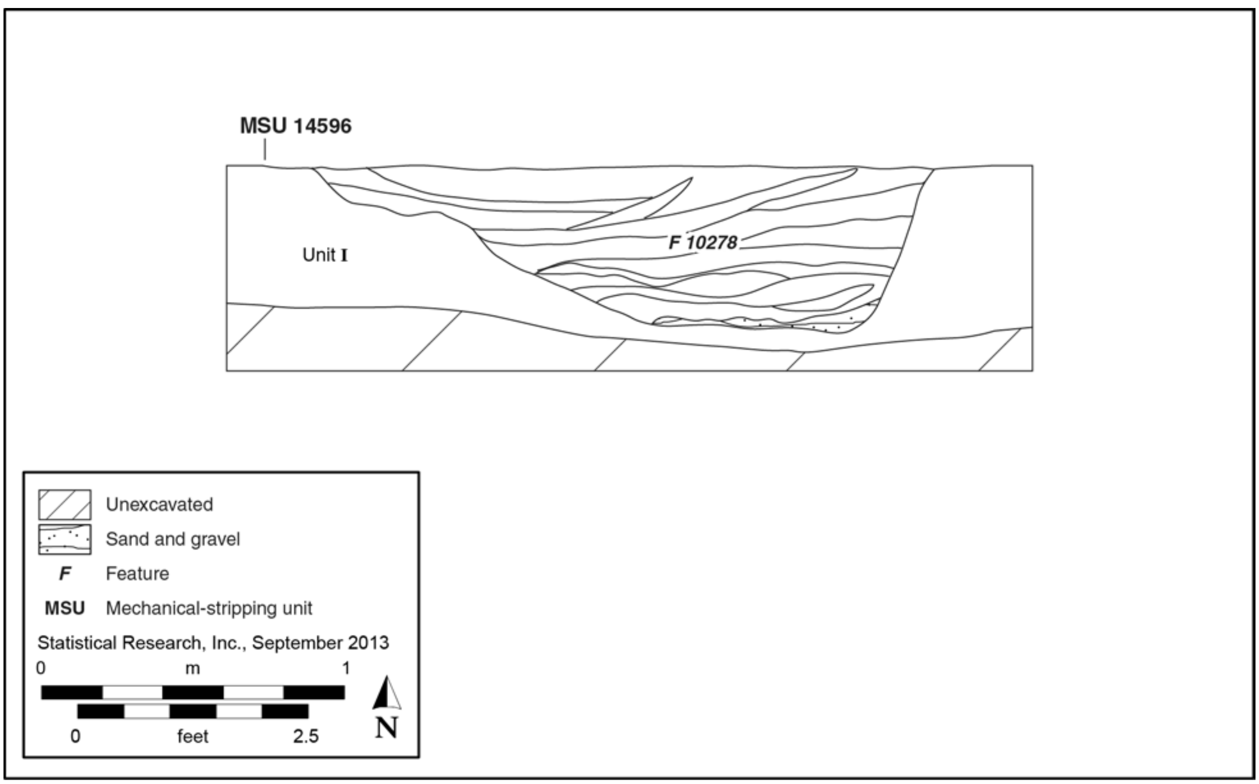

Figure 211. Profile of Feature 10278 (a possible reservoir), in the northern face of TR 10061, at Falcon Landing.

Figure 212. Photograph of Feature 10278 (a possible reservoir) at Falcon Landing, view to the south.

Table 77. Particle Sizes of Sediments in Feature 10278 at Falcon Landing

TP 14000	Sand (%)	Silt (%)	Clay (%)
Level 3	3.9	88.8	7.3
Level 4	11.9	82.2	5.9
Level 5	21.6	73.4	5.0

Chronometric Data

Diagnostic Material Culture

A side-notched projectile point was recovered from Level 5 of TP 14000, near the base of the pit. This particular projectile point could not be confidently assigned to any specific type, but it is likely associated with other Middle or Late Archaic period–style points (see Chapter 3, Volume 2).

Geochronologic Analysis

Feature 10278 originated at the surface of Unit I, with late Holocene alluvial-fan deposits (Unit III2/Unit IV) overlying it. The unconformity between the surface of Unit I and Unit III2/Unit IV provides a geochronologic date of ca. 5320–1190 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon Analysis

A piece of charred mesquite (*Prosopis* sp.) wood from Level 5 of TP 14000 was submitted to Aeon for AMS dating. The charred plant material produced a 2σ calibrated date range of 1120–1000 cal. B.C. (Aeon Sample No. 1485), corresponding to the San Pedro phase (see Chapter 2, Volume 2).

Abandonment Processes

Feature 10278 had multiple, alternating deposits of silt and clay as well as a basal deposit of coarse sand and gravel. As a result, it appears that Feature 10278 was aboriginally excavated and immediately filled with a deposit of high-energy sand and gravel. After the sand and gravel deposition, the feature was left open for a prolonged period, allowing standing water to accumulate. This resulted in the deposition of intermittent layers of silt and clay throughout the rest of the feature fill. Charcoal from the basal deposit was radiocarbon dated to the San Pedro phase, but the upper deposits of Feature 10278 were not dated. So, the duration of deposition within Feature 10278 is unknown. The profile of Feature 10278 (see Figure 211) shows multiple layers of silt and clay that may represent different uses of the pit, such as intentional dredging out of sediment followed by natural redeposition. This process is particularly evident in the upper-left-hand portion of the profile, where the upper limits of Feature 10278 appear to have been expanded horizontally to encompass a larger area, with corresponding bowl-shaped silt and clay deposits.

Stratigraphic Relationships and Associated Features

Few features were present in the vicinity of Feature 10278 (see Appendix A). Three nonthermal pits (Features 14655, 14679, and 14687) and a charcoal/ash lens (Feature 14688) were in proximity to Feature 10278, but none of them were contemporaneous.

Nonfeature Deposits

The main focus of SRI's Phase 2 data recovery was the excavation of feature contexts. In some instances, however, the natural site sediments were excavated in a controlled manner, and it was determined that artifacts were present within the natural sediments. The following discussion summarizes the results of excavation within nonfeature contexts. For the purposes of this discussion, the nonfeature contexts in Areas A and B are presented separately, and not all nonfeature contexts are discussed here. Only two locations have been selected for this discussion, one in Area A and one in Area B. These two locations were chosen on the basis that they both were deep excavations (between 0.5 and 1 m in depth), produced relatively high densities of artifacts, and were spatially associated with areas containing relatively high densities of structures and extramural features.

Area A Test Units

During mechanical excavations in Area A, two large, adjacent charcoal/ash lenses (Features 2537 and 14656) were identified (see Figure 145). Hand-stripping units were used to define these large features in plan view, and 1-by-1-m test units were used to define their depths. TP 17853 was used to excavate Feature 2537, and TP 17865 was used to excavate Feature 14656. Both TPs 17853 and 17865 were excavated in arbitrary 10-cm levels, or stratigraphically, when possible. Sediments were screened through 1/4-inch mesh, and pollen and flotation samples were collected from each level. TP 17853 had a total of 11 levels, and TP 17865 had a total of 10 levels. Although nearly every level of the test units produced artifacts, both Features 2537 and 14656 were very shallow, corresponding to only the first 30 cm of test-unit excavation (Figure 213; see Figure 146). The remainder of the test-unit excavation below the level of the feature consisted of the natural site sediments. Detailed stratigraphic profiles were drawn of the test-unit walls, allowing for a correlation between excavated levels and natural stratigraphy (see Chapter 2, Volume 2, for a more detailed description of the natural stratigraphy). The two test units each have a volume of 1 m^3, for a combined volume of 2 m^3. In total, 124 artifacts were recovered from the two units (Table 78), for a combined density of about 60 artifacts per cubic meter. The artifacts were predominantly flaked stone debitage (n = 104) but also included faunal bone, FAR, and a biface.

Both TPs 17853 and 17865 were excavated into Unit III2cf, corresponding to an isolated deposit of channel-fan alluvium. The bracketing age range for Unit III2cf is 160 cal. B.C.–cal. A.D. 340 (see Chapter 2,

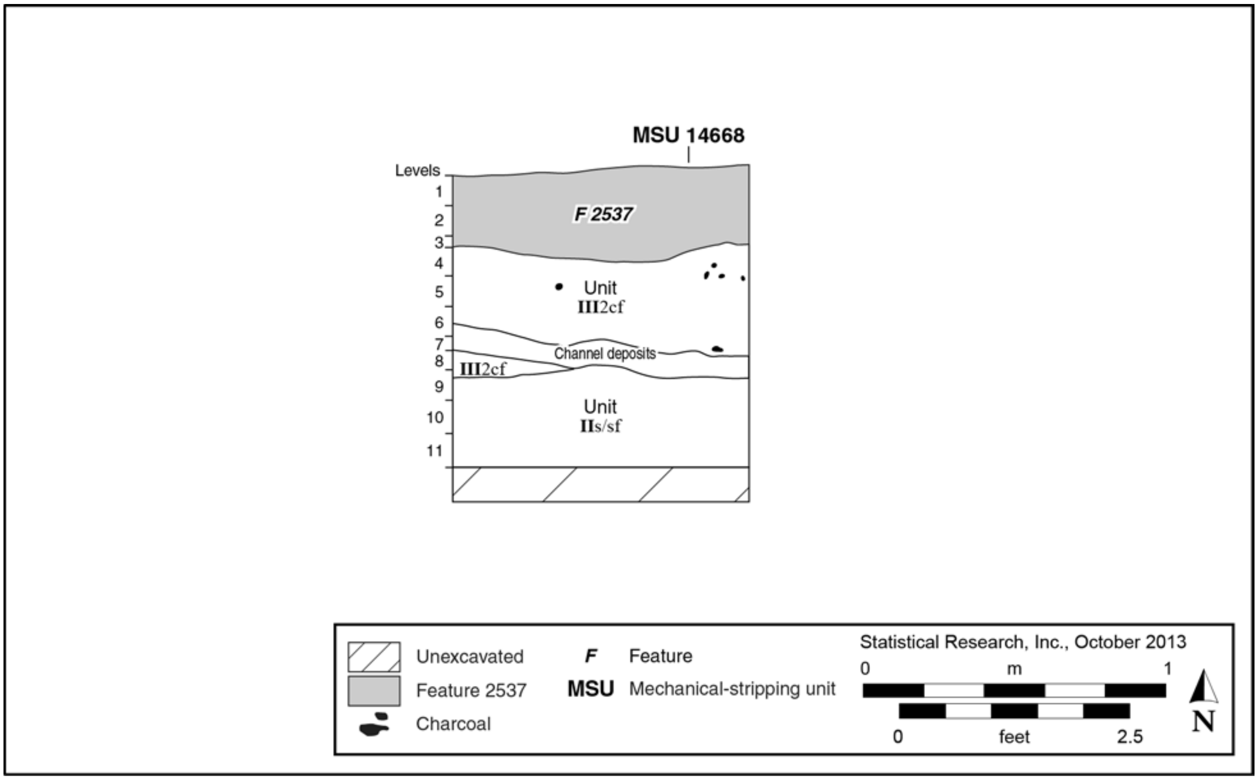

Figure 213. Profile of Feature 2537 (a charcoal/ash lens), in the northern face of TP 17853, at Falcon Landing.

Table 78. Artifacts Recovered from Area A Test Units at Falcon Landing

Level No., by TP No.	Unworked Faunal Bone	Lithic Artifacts			Total
		FAR	Flaked Stone Debitage	Flaked Stone Tools	
17853					
1	3	7	4	—	14
2	1	—	1	—	2
5	—	—	—	1	1
8	—	—	2	—	2
9	—	—	1	—	1
Subtotal	4	7	8	1	20
17865					
1	6	—	38	—	44
2	—	—	37	—	37
3	—	—	13	—	13
4	1	—	4	—	5
7	1	—	1	—	2
8	—	—	2	—	2
9	—	—	1	—	1
Subtotal	8	—	96	—	104
Total	12	7	104	1	124

Volume 2), corresponding to the Late Cienega to Red Mountain phase. The bottom levels of TPs 17853 and 17865 encountered the upper surface of Unit IIs/sf, which postdates 790 cal. B.C. Pieces of charred mesquite (*Prosopis* sp.) wood from Levels 1, 6, and 8 of TP 17865 were submitted to Aeon for AMS dating, to further the geoarchaeological analysis of the natural site sediments. Charcoal from Level 1 produced a 2σ date of cal. A.D. 70–320 (Aeon Sample No. 1516), charcoal from Level 6 produced a 2σ date of cal. A.D. 80–250 (Aeon Sample No. 1517), and charcoal from Level 8 produced a 2σ date of ca. A.D. 1–220 (Aeon Sample No. 1518). These dates also indicate a rapid sedimentation rate for Unit III2cf, with approximately 70 cm of deposition occurring over approximately 100 years.

Area B Test Units

On January 19, 2012, an isolated piece of human bone was identified on the surface of MSU 1281 and was not associated with a feature. In order to determine whether a human burial was present, a 2-by-2-m test unit (TP 8230) was placed over the location of the human bone (Figure 214). TP 8230 was excavated in five arbitrary 10-cm levels to a depth of 0.5 m below the stripped surface, resulting in an excavated volume of 2 m^3. The sediments from TP 8230 were screened through 1/8-inch mesh, and pollen and flotation samples were collected from each level. Upon excavation of TP 8230, it was realized that a portion of the southern end of the trench overlapped with previously backfilled TR 1230. No other human bone was encountered. Five more 2-by-2-m test units (TPs 8265, 8282, 8380, 8382, and 8949) were excavated in the area surrounding TP 8230 to further investigate whether a human burial was present (see Figure 214). TP 8282 was placed along the northern end of TR 1230, and TP 8380 was placed to the south of TR 1230. Each unit was excavated in the same manner as TP 8230. No human remains were encountered in any of the test-unit excavations, but relatively high densities of artifacts were recovered. The six test units excavated in MSU 1281 had a combined volume of 10.8 m^3, or an average of 1.8 m^3 per unit. The six test units produced 1,143 artifacts of flaked stone, ground stone, faunal bone, and shell (Table 79), resulting in approximately 100 artifacts per cubic meter. Artifacts recovered from the test units were predominantly flaked stone debitage (n = 646) and faunal bone (n = 471).

All six Area B test units were excavated into Unit III2 sediments, corresponding to late Holocene alluvial-fan deposits. Unit III2 has a bracketing age range of 1190–200 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Late Archaic period. The bottom levels of TPs 8282, 8380, and 8382 reached the Unit I surface, which postdates 5320 cal. B.C., and at that point, cultural materials were no longer recovered from the test units.

Nonfeature Results

The nonfeature excavations in both Areas A and B showed that abundant artifacts are present in the natural site sediments. These artifacts provide a general idea of the natural processes at work in the APE. Discrete extramural-pit features are not the only contexts that contain cultural materials, because prehistoric groups undoubtedly left their refuse on aboriginal surfaces. Over time, these artifacts were likely transported horizontally across the site through sheetwash and vertically through the natural sediments via bioturbation and soil formation (Schiffer 1996).

In both areas described above, the nonfeature excavations were located in proximity to discernible clusters of features. For example, in Area A, TPs 17853 and 17865 were located in Grids H5 and I5, respectively (see Appendix A). Both these grid locations included numerous structures and spatially associated extramural features. Similarly, in Area B, the test units described above were located in Grid B4 (see Appendix A), where numerous structures, activity areas, and extramural features were located. The association of feature clusters to high densities of artifacts in the natural sediments is likely not a coincidence. For instance, features within Grid B4 have been radiocarbon dated to ca. 2400 cal. B.C.–cal. A.D. 1200, a range of approximately 3,600 calendar years. Thousands of years of human occupation in the project area have undoubtedly contributed to the accumulation of artifacts in the natural sediments.

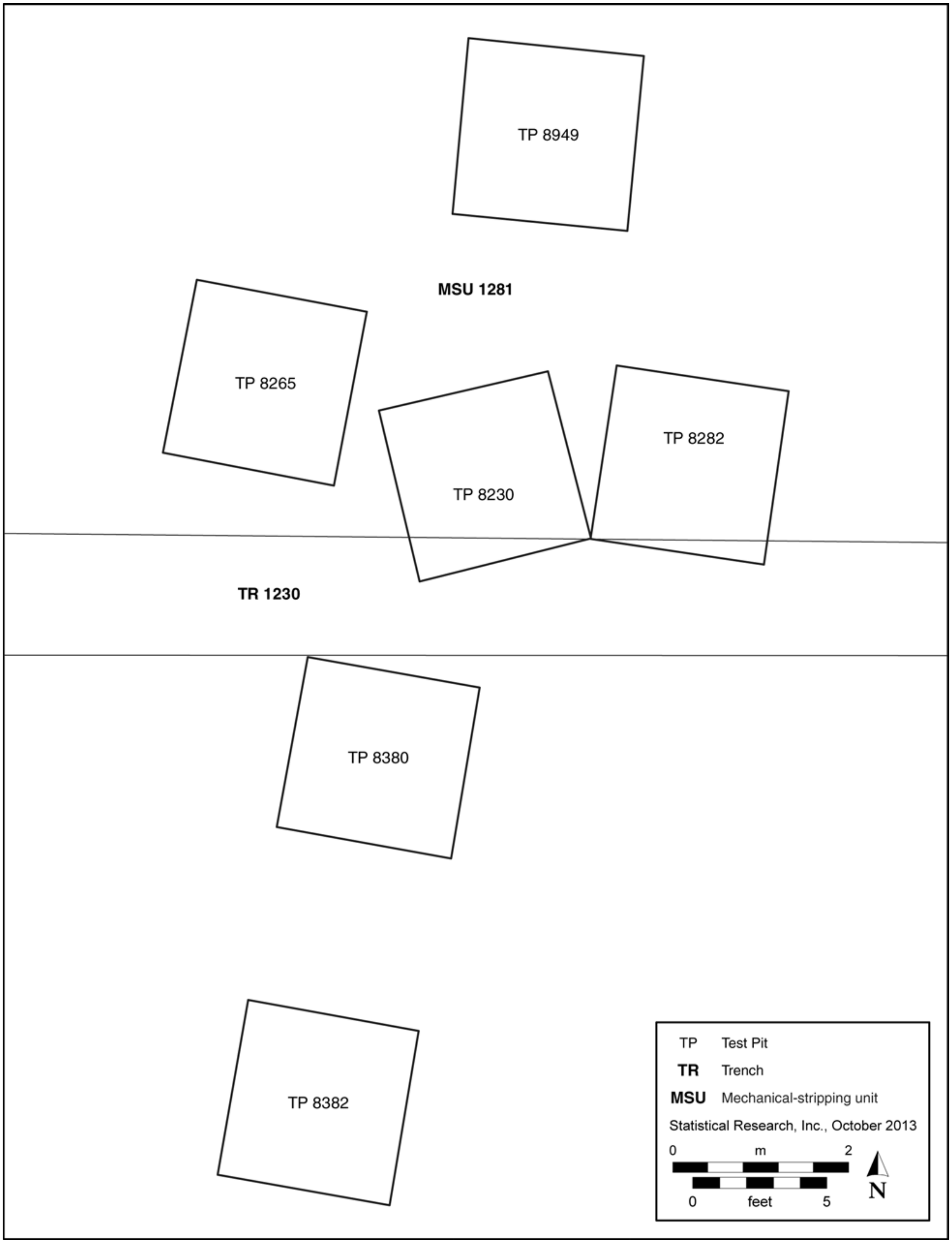

Figure 214. Plan view of TPs 8230, 8265, 8282, 8380, 8382, and 8949 and TR 1230 at Falcon Landing.

Table 79. Artifacts Recovered from Area B Test Units at Falcon Landing

Level No., by TP No.	Unworked Faunal Bone	Lithic Artifacts							Unworked Shell	Total
		FAR	Flaked Stone Debitage	Flaked Stone Tools	Ground/ Battered Stone	Manos	Metates	Projectile Points		
8230										
1	20	—	31	—	—	—	—	1	—	52
2	25	1	39	—	—	—	1	1	1	68
3	27	—	42	1	—	1	—	—	—	71
4	28	—	28	1	—	—	—	—	—	57
5	26	—	9	—	—	—	—	—	—	35
Subtotal	126	1	149	2	—	1	1	2	1	283
8265										
1	27	—	45	—	—	—	—	—	—	72
2	27	—	30	—	—	—	—	—	—	57
3	6	—	12	—	—	—	—	—	1	19
Subtotal	60	—	87	—	—	—	—	—	1	148
8282										
1	12	1	31	—	2	1	1	—	—	48
2	11	—	17	—	—	3	1	—	—	32
3	8	1	14	1	—	—	—	—	—	24
4	4	1	22	—	—	—	—	—	—	27
Subtotal	35	3	84	1	2	4	2	—	—	131
8380										
1	20	—	56	—	—	—	—	—	—	76
2	14	—	32	—	—	—	—	—	—	46
3	7	—	23	—	—	—	—	—	—	30
4	9	—	15	—	—	—	—	—	—	24
5	4	—	5	1	—	—	—	—	—	10
Subtotal	54	—	131	1	—	—	—	—	—	186

continued on next page

Level No., by TP No.	Unworked Faunal Bone	Lithic Artifacts							Unworked Shell	Total
		FAR	Flaked Stone Debitage	Flaked Stone Tools	Ground/ Battered Stone	Manos	Metates	Projectile Points		
8382										
1	41	—	46	—	1	—	—	—	—	88
2	13	—	23	—	—	—	—	—	—	36
3	13	—	26	—	—	—	—	—	—	39
4	15	—	32	1	—	—	—	—	—	48
5	40	—	4	—	—	—	—	—	—	44
6	—	1	2	—	—	—	—	—	—	3
Subtotal	122	1	133	1	1	—	—	—	—	258
8949										
1	18	—	18	—	—	—	—	—	—	36
2	21	—	18	—	—	—	—	—	—	39
3	13	1	19	—	—	—	—	—	—	33
4	22	—	7	—	—	—	—	—	—	29
Subtotal	74	1	62	—	—	—	—	—	—	137
Total	471	6	646	5	3	5	3	2	2	1,143

Historical-Period Component

A small Historical period component was identified at Falcon Landing. It consisted of a scatter of surface artifacts that were point-located and collected during Phase 1 (see Appendix D) as well as a single pit (Feature 1664) that contained copious amounts of faunal bone (for a more in-depth discussion of the faunal-bone analysis, see Chapter 4, Volume 2). The following is a description of the single Historical period feature at Falcon Landing.

Feature 1664

Feature type: nonthermal pit
Age: Historical period
Level of effort: complete
Plan-view shape: ovate
Cross-sectional shape: basin

Length (m): 1.33
Width (m): 1.02
Excavated depth (m): 0.12
Volume (m^3): 0.080

Excavation Methods

Feature 1664 was an extramural nonthermal feature identified during the excavation of MSU 4437, in the southwestern portion of Area B (see Appendix A). Stripping was halted when quantities of faunal bone appeared at the edge of the stripping unit. Mechanical stripping removed an unknown amount of the northern portion of Feature 1664 before mechanical stripping was halted. The southern portion of the feature remained pedestaled and was hand-excavated as HSU 1666 until the southern pit outline was observed (Figure 215). A pit edge was identified approximately 20 cm into the excavation of HSU 1666, where the pit was excavated into Unit II, beneath some rodent disturbance, and it was thereafter identified as a feature. The pit was then excavated in two sections. The northern half was excavated as SEC 1673, and the southern half was excavated as SEC 1676 (see Figure 215). Each of the sections was excavated in a single level and screened through $^1/_8$-inch hardware cloth. Flotation samples were collected from the fill of each section, and a pollen sample was collected from the base of the feature. A scaled map and cross sections were drawn at the completion of excavation, and digital photographs were taken.

Feature Fill

The feature was first identified around 0.3–0.5 m below the modern ground surface. The upper portion of the pit was not visible in HSU 1666, and the lower part was dug into Unit III2cf. The pit was roughly ovoid and basin shaped and was dug into yellowish brown sandy loam with subangular fine and coarse gravels (Figure 216). The fill was loosely compacted, brown sandy loam with coarse, subangular gravels and was heavily disturbed by recent rodent burrowing; the upper fill contained mostly rodent bone, which became denser toward the pit base. Immature kangaroo-rat and pocket-mouse bones recovered from the fill likely represented burrow deaths; these two genera are known to share burrows in southern Arizona (Hoffmeister 1986). The pit base was also disturbed by bioturbation. No charcoal or prehistoric artifacts were recovered, but the pit fill and that of adjacent HSU 1666 contained a 12-gauge shotgun shell and an astonishing 1,827 faunal bones and fragments representing a wide and diverse variety of taxa. Leporid bones dominated the faunal collection, including black-tailed- and antelope-jackrabbit and cottontail bones. Many other taxa were present, including cotton rat, woodrat, kangaroo mouse, pocket mouse, antelope ground squirrel, coyote or dog, probable hawk, robin, quail, possible sapsucker, collared lizard, rattlesnake, nonvenomous snake, and frog or toad. There were also a few pieces of turtle or tortoise shell; some eggshell; a very small, intrusive *Succinea* sp. land snail; and a few pieces of sheep/goat and cattle bone. The rabbit carcasses appeared to have been relatively complete when placed in the pit and so were unlikely to have been food waste. Rather, the feature probably represents a hunting episode in which many individual animals were taken but discarded relatively unprocessed. The high proportion of leporid bones and the timing indicated by the shotgun shells suggest that this feature may represent a rabbit-hunting event such as occurred in times of booming jackrabbit

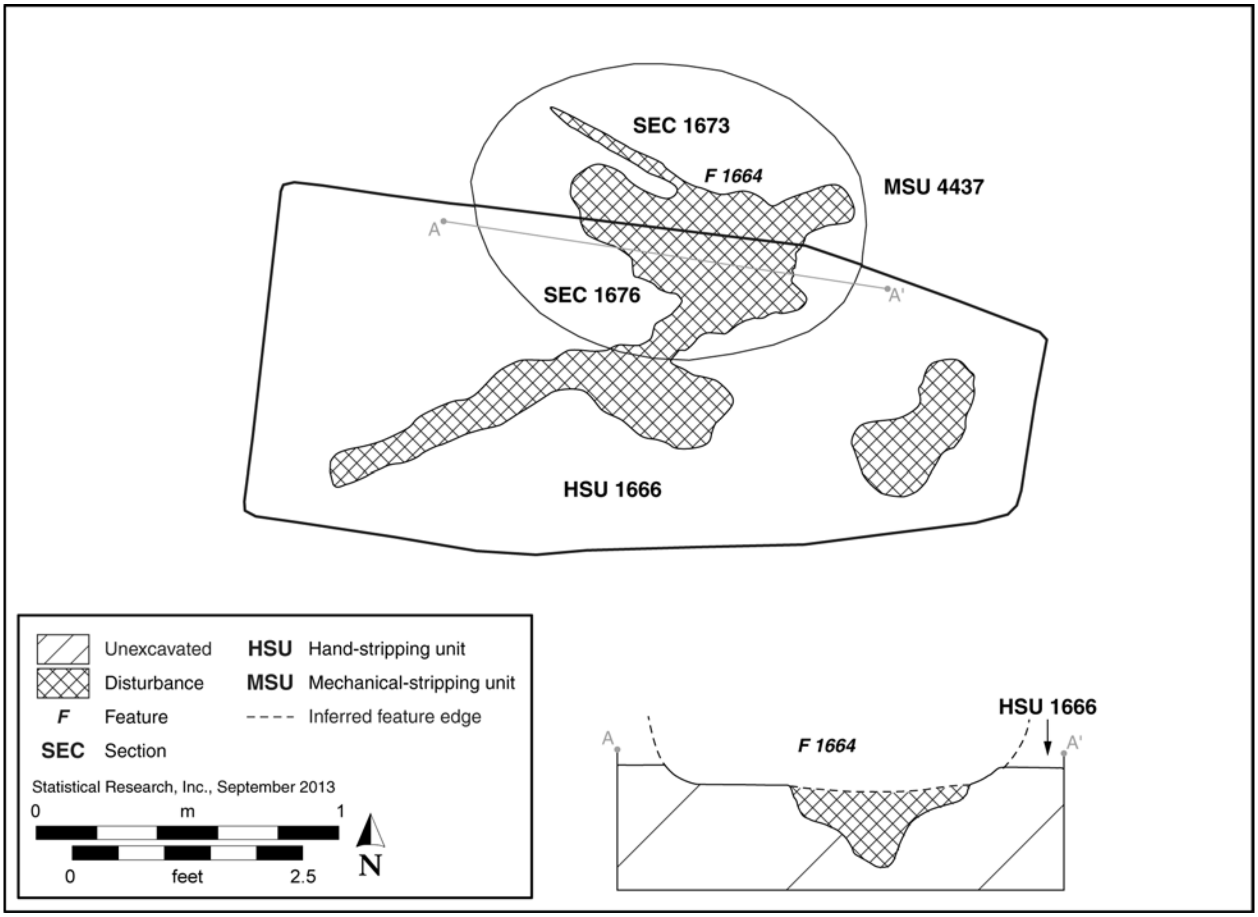

Figure 215. Post-excavation plan view and cross section of Feature 1664 (a Historical period nonthermal pit filled with an unusual quantity of faunal bones) at Falcon Landing.

Figure 216. Photograph of the in-progress excavation of historical-period pit Feature 1664 at Falcon Landing, showing exposed faunal remains.

populations. Jackrabbit populations fluctuated greatly during the late nineteenth and early twentieth centuries, and farmers and ranchers responded to the booming jackrabbit population by killing large quantities of the animals (see Chapter 4, Volume 2, for additional details).

Chronometric Data

Diagnostic Material Culture

Shotgun shells intermixed with the bones provided a well-defined date of deposition for the feature. The four 12-gauge shotgun shells from the feature were heavily corroded. Only one headstamp remained partially legible; it read "[WINCHESTER/LEADER]/№ 12". The "1901 Leader" was produced by the Winchester Repeating Arms Company beginning in the 1900s and continued in production for many decades. That particular headstamp, though, was produced only until 1920. The shotgun shells had red, roll-crimped paper barrels, and the company claimed that the cartridge was the "finest smokeless powder shell science can produce" (Farrar 2013).

Geochronologic Analysis

Feature 1664 was intrusive into Unit III2cf (see Chapter 2, Volume 2). The upper boundary of Feature 1664 was not identified during mechanical excavations of MSU 4437, but the pit likely originated at or very near the modern surface of the site.

Radiocarbon Analysis

None.

Abandonment Processes

Feature 1664 appeared to have had a single use, after which it was abandoned. It filled after the animal carcasses were in place. The brief use of this pit and its rapid filling made it very difficult to distinguish from the surrounding natural sediments.

Stratigraphic Relationships and Associated Features

No associated Historical period features were present. Historical period artifacts were present on the surface of Falcon Landing (see Appendix A) but could not be directly associated to this feature.

AZ T:7:68 (ASM)

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Although only a small portion (about 3 percent) of Site 68 was investigated as part of the current project, we feel quite confident that the site likely contains an extensive series of seasonal encampments, much like the ones seen at nearby Falcon Landing (see Chapter 4). Only four distinct occupations were identified, however: the Early to Middle Archaic period, the Middle to Late Archaic period, the Late Archaic to Protohistoric period, and the Snaketown phase of the Pioneer period. Of significance is that only the northernmost 2 acres (8,400 m^2) of this previously recorded 60-acre site (Adams 1991:4) is located within the APE (Figure 217). A single isolated historical-period artifact was also encountered, on the site surface (see Appendix D).

Site 68 is located on a broad, silty alluvial expanse that, today, is dominated largely by moderately dense saltbush (*Atriplex* sp.), wolfberry (*Lycium* sp.), and creosote bush (*Larrea tridentata*). A drainage lined with palo verde (*Parkinsonia microphylla*) trees is located to the northwest, and there are several others in the immediate area. Average site elevation is 325 m (1,066 feet) AMSL, and the most predominant geologic marker near the site is a salt dome (Sunset Point) approximately 1.6 km (1 mile) to the east. The nearest mountain range is the White Tank Mountains, 9.7 km (6 miles) to the west, and the Agua Fria River is 7 km (4.3 miles) to the east (see Figure 2). Site 68 is located 25 m southwest of Falcon Landing and 76 m south of Site 423 (see Figure 1).

The entirety of our work at the site resulted in the point-location of 8 artifacts and the investigation of 37 features: 33 extramural pits, 2 structures, 1 burial, and 1 artifact concentration (Table 80).

Previous Archaeological Investigations

Site 68 was originally recorded in 1991 by ACS, during a cultural resource survey of a 440-acre parcel directly south of LAFB (Adams 1991). The parcel surveyed by ACS includes the entirety of the Luke Solar project APE. Adams (1991:4) stated that within the parcel,

> [t]he majority of artifactual material . . . consists of chipped and ground stone implements with low density ceramic scatters. This type of artifact assemblage over a large area is most often interpreted as plant processing and temporary or seasonal camps. The distribution of the artifactual material suggests extensive, repeated utilization of the wild resources of the area. The low proportion of ceramic to stone artifacts is sometimes interpreted as indicating an Archaic age, and the presence of an isolated Archaic style projectile point supports this interpretation.

Interestingly, Adams's summary of the archaeological material within the ACS parcel corresponds well to the results of SRI's intensive data recovery. In all likelihood, Site 68 represents a continuation of what is defined within the Luke Solar project area. Also interesting is that ACS recorded only isolates within the current Luke Solar project area and did not consider that area a separate archaeological site.

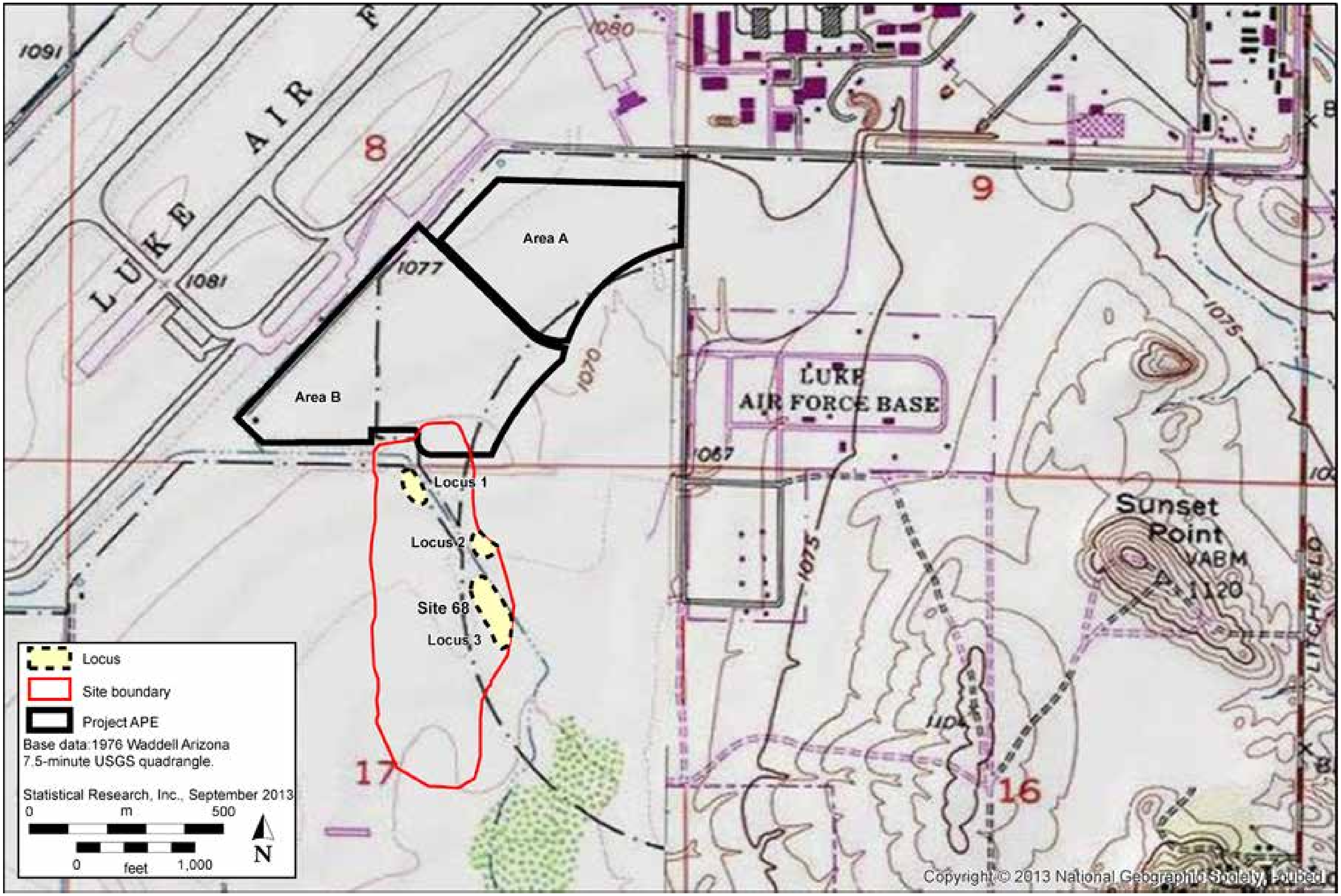


Figure 217. Site 68 as previously recorded by Adams (1991).

Table 80. Site 68 Feature Inventory and Excavation Level of Effort

Feature Type	Fully Excavated	Partially Excavated	Examined	Sampled	Total
Burials	1	—	—	—	1
Structures	2	—	—	—	2
Nonthermal pits	6	11	13	2	32
Nonthermal bell-shaped pits	1	—	—	—	1
Artifact concentration	1	—	—	—	1
Total	11	11	13	2	37

Site 68 was described by Adams (1991:4–6) as a prehistoric site extending 700 m north–south by 350 m east–west and covering about 60 acres. A series of artifact scatters is present, and there are three areas of relatively high density, designated Loci 1–3 (see Figure 217). These loci coincide with deflated surfaces where erosion has exposed archaeological remains that are preserved below the ground surface. Although Adams's loci are not within SRI's APE, based on SRI's findings, Adams rightly interpreted the eroded artifact concentrations as evidence of extensive buried cultural deposits in the area. The three loci consist of areas containing burned and unburned rock and flaked stone and ground stone artifacts. In addition, Adams (1991:Figure 4) indicated the presence of burned wood and daub in Locus 1.

In general, the artifacts associated with Site 68 include mainly flaked stone artifacts, including a few cores and a few ground stone artifacts. Flaked stone raw materials include basalt, rhyolite, andesite, and dacite. The only ceramic artifacts identified at Site 68 included a small scatter of six sand-tempered plain ware sherds and four isolated plain ware sherds (Adams 1991:4).

The northern boundary of Site 68 only slightly overlaps with the southern boundary of the Luke Solar project APE. The portion of Site 68 within the Luke Solar project APE extends about 80 m north–south by about 120 m east–west (see Figure 217). As a result, the major portion of Site 68 extends south of the Luke Solar project APE and beyond SRI's investigations.

Summary of Phase 1 Investigations

SRI conducted Phase 1 investigations at Site 68 on November 3–11, 2010. Phase 1 began with the resurvey and establishment of the site boundary within the APE, followed by the collection of all surface artifacts, which were individually point-located and collected. In sum, only two pieces of flaked stone debitage (PDs 3 and 4), one unidirectional core (PD 16), one indeterminate ground stone fragment (PD 6), and one machine-made can (PD 5) were found on the modern ground surface within the APE (Figure 218; Table 81). No features were identified on the modern ground surface. Once the surface artifacts were collected and mapped, four east-west-oriented backhoe trenches (TRs 7, 9, 14, and 18) were excavated through the site at 15-m intervals (see Figure 218). In total, 403 m of trench were excavated to depths between 1.30 and 1.65 m (4.3 and 5.4 feet) below modern ground surface. One mano, one multidirectional core, and one piece of flaked stone debitage were recovered during the excavation of TR 18; artifacts were not identified in any of the other trenches. Investigation of the trench walls resulted in the identification of two buried nonthermal pits (Features 11 and 17, in TRs 7 and 14, respectively) and one house-in-pit (Feature 13, in TR 7) (Table 82). The originating depths of the features were between 0.1 and 0.2 m below modern ground surface, either at the contact between Units III1 and V (Features 11 and 13) or within Unit III1 (Feature 17) (see Chapter 2, Volume 2). Each feature was photographed, described, and mapped with a scaled, hand-drawn profile (Figures 219 and 220), and feature locations (see Figure 218) were recorded using a total station. (Note: The profile of Feature 13 is not included in this report.) Flotation samples were collected from the profiles of both extramural features; one unmodified fragment of a medium-sized-mammal bone was recovered from the profile of Feature 11. No further Phase 1 work was conducted at Site 68.

Figure 218. Site 68 map, Phase 1.

Table 81. Point-Located Surface and MSU Artifacts at Site 68

PD No.	Artifact Class	Artifact Type	Technological Type	Condition or Portion	Count	Material	Comments
			Surface Artifacts				
3	flaked stone debitage	debitage	shatter	indeterminate	1	chert	
4	flaked stone debitage	debitage	core flake	proximal	1	rhyolite	
5	metal	can	machine-made	whole	1	metal	paint can, cylindrical, press-fit lid
6	ground/battered stone	ground stone	indeterminate	fragment	1	metamorphic	
16	flaked stone tool	core	unidirectional core	whole	1	rhyolite	
			MSU Artifacts				
77	ground/battered stone	metate	closed basin metate	whole	1	granite	
156	ground/battered stone	mano	cobble mano	whole	1	quartzite	
173	ground/battered stone	metate	flat/concave metate	whole	1	basalt	residue present on non-use surface

Table 82. Site 68 Feature Summary

Feature No.	Feature Type	Age	Phase Identified	Location	Phase Investigated	Level of Effort
11	nonthermal pit	Middle to Late Archaic period	Phase 1	TR 7	Phase 2	sampled
13	house-in-pit	Snaketown phase	Phase 1	TR 7	Phase 2	complete
17	nonthermal pit	Middle to Late Archaic period	Phase 1	TR 14	Phase 2	sampled
62	nonthermal pit	Early to Middle Archaic period	Phase 2	MSU 58	Phase 2	examined
63	nonthermal pit	Early to Middle Archaic period	Phase 2	MSU 58	Phase 2	examined
64	nonthermal pit	Early to Middle Archaic period	Phase 2	MSU 58	Phase 2	examined
65	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 58	Phase 2	complete
67	nonthermal pit	Early to Middle Archaic period	Phase 2	MSU 58	Phase 2	examined
68	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 58	Phase 2	complete
70	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 58	Phase 2	examined
71	nonthermal pit	Early to Middle Archaic period	Phase 2	MSU 58	Phase 2	complete
73	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	partial
74	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	partial
75	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	partial
79	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	partial
81	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	examined
82	artifact concentration	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	complete
84	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	partial
87	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 58	Phase 2	complete
88	house-in-pit	Middle to Late Archaic period	Phase 2	MSU 58	Phase 2	complete
89	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	examined
90	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	examined
91	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	examined
92	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	examined
93	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	examined
94	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	examined
95	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	partial

continued on next page

Feature No.	Feature Type	Age	Phase Identified	Location	Phase Investigated	Level of Effort
96	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 60	Phase 2	partial
97	nonthermal pit	Snaketown phase	Phase 2	MSU 60	Phase 2	partial
106	burial	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	complete
142	nonthermal bell-shaped pit	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	complete
146	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	partial
147	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	complete
148	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	partial
157	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	partial
158	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 60	Phase 2	examined
206	nonthermal pit	Late Archaic to Protohistoric period	Phase 2	MSU 58	Phase 2	complete

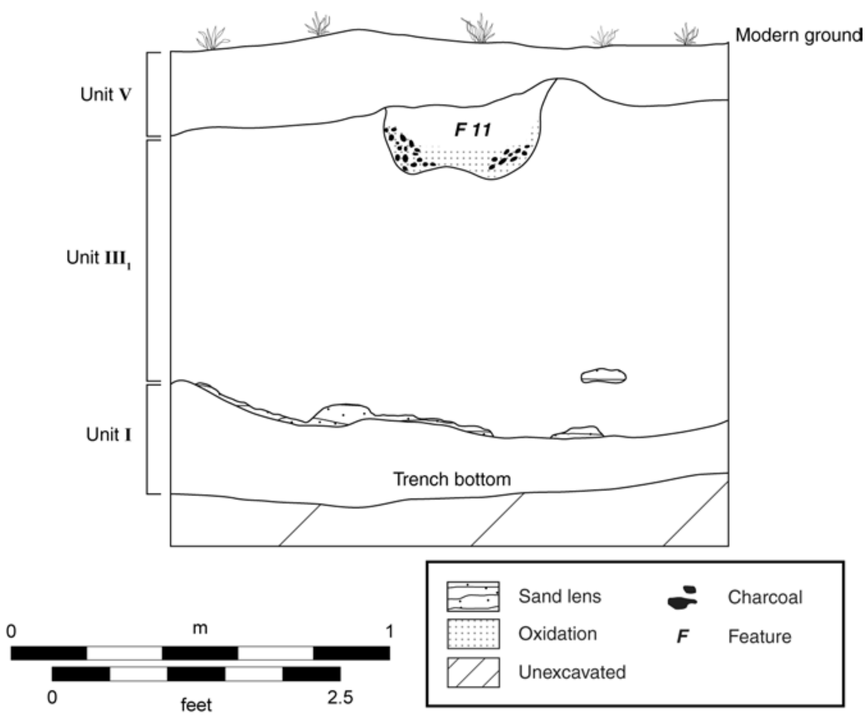


Figure 219. Profile of Feature 11, in the northern wall of TR 7.

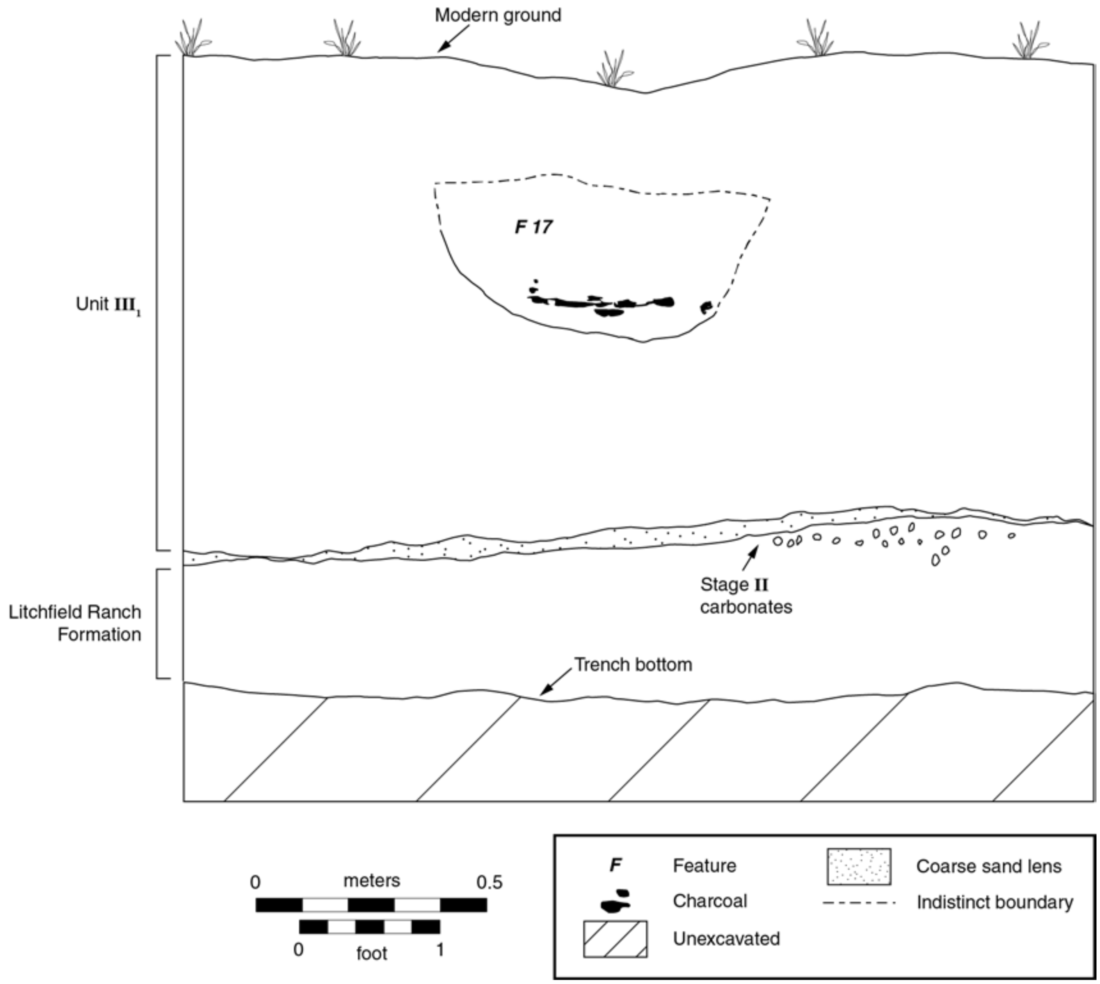


Figure 220. Profile of Feature 17, in the southern wall of TR 14.

Phase 2 Goals and Field Methods

Phase 2 investigations at Site 68 took place between September 17, 2011, and January 26, 2012. Our efforts began with mechanical stripping to expose Feature 13. This area was designated MSU 58, and the footprint was expanded either until it reached an erosion-control ditch that flanked the paved LAFB perimeter road that formed the southern edge of the APE or until a 15-m buffer was created around a feature (Figure 221). The depth of MSU 58 varied as features were identified. We found in our previously excavated test trenches that no feature originated within Unit I; so, if cultural materials were not present, MSU 58 was terminated upon reaching the Unit I/III1 interface, which was approximately 0.5 m below modern ground surface (see Chapter 2, Volume 2). MSU 58 encompassed 760 m^2 (0.19 acres), and roughly 203 m^3 of sediment were excavated.

A second MSU (MSU 60) was used to expose Features 11 and 17. The footprint and depth of MSU 60 was expanded in much the same way as MSU 58 had been, with the perimeter road, the erosion-control ditch, and the APE boundary to the south and a 15-m-wide feature buffer to the north, east, and west (see Figure 221). For the same reasoning used in the excavation of MSU 58, MSU 60 was terminated upon reaching the Unit I horizon, approximately 0.5 m below modern ground surface (see Chapter 2, Volume 2). MSU 60 encompassed 3,200 m^2 (0.8 acres), and roughly 898 m^3 of sediment were excavated.

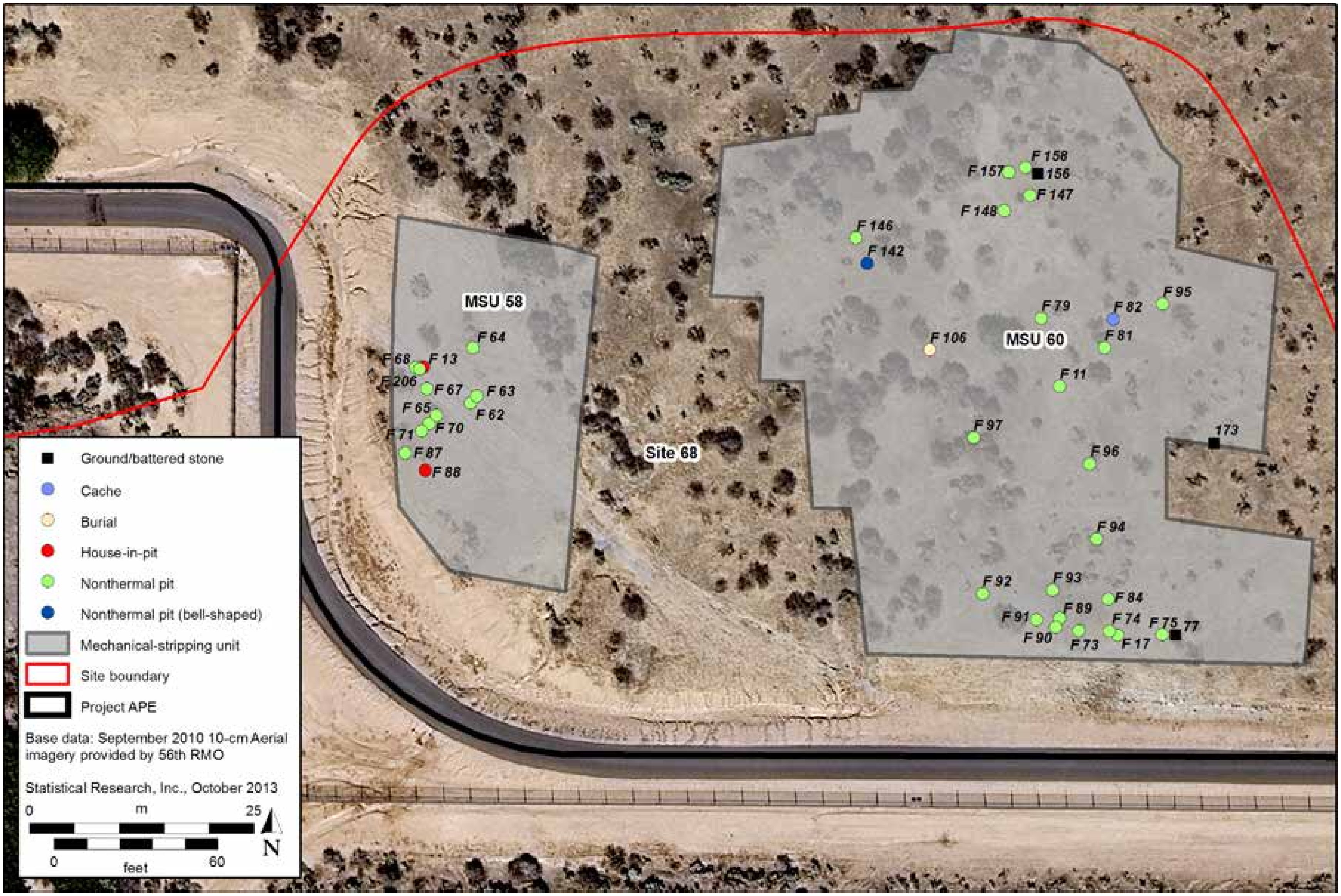


Figure 221. Site 68 map, Phase 2.

A single human-burial feature (Feature 106) was identified at Site 68. It consisted of a heavily disturbed cremation identified on the stripped surface of MSU 60. The cremation was represented by fragmentary human bone scattered over a 6.53-by-3.35-m area. Because no burial pit or clear feature boundary was identified, excavation was directed by the presence and location of human-bone fragments. The human-bone fragments were point-located on a hand-drawn map, and then a series of HSUs were excavated over the area until no additional human remains were encountered. HSUs were excavated in 10-cm-deep, arbitrary levels, and all sediments were screened through 1/8-inch mesh. The human remains exhibited varying degrees of thermal alteration, from superficially charred to completely calcined. Further details regarding the excavation procedures and findings are presented in the Human Burial section, near the end of this chapter.

Each structure was completely excavated, including all intramural pits and postholes. We then fully or partially excavated 57 percent of all extramural features. Detailed information regarding the excavation methods can be found in Chapter 3. In addition, further details regarding the structure- and extramural-feature-excavation procedures and findings can be found in the Architecture and Extramural Features sections of this chapter. Unexcavated extramural features were examined during Phase 2, on April 15, 2013, as part of a good-faith effort to clear the APE of human remains and funerary items (see the Site Closure section in Chapter 3). Further details regarding the results of extramural-feature examinations can be found in Table 83.

Phase 2 Results

In total, 37 features were identified at Site 68 (see Table 82). While exposing previously identified Feature 13 (a house-in-pit) in plan view, 11 additional features were identified in MSU 58: 10 nonthermal pits and 1 house-in-pit (see Figure 221). The excavation of MSU 60 exposed previously identified Features 11 and 17 (nonthermal pits) as well as 23 additional features: 20 nonthermal pits, 1 nonthermal bell-shaped pit (Feature 142), 1 burial (Feature 106), and 1 artifact concentration (Feature 82) (see Figure 221). Two metates (PDs 77 and 173) and one mano (PD 156) were also recovered during the excavation of MSU 60 (see Table 81). These were mapped with the total station and are identified as ground/battered stone in Figure 221.

In summary, 35 extramural features and 2 structures were investigated at Site 68. Both of the structures were completely excavated, and the 35 extramural features were excavated to varying degrees: 11 were partially excavated, 9 were fully excavated, 2 were sampled, and 13 were examined (see Table 80). Extramural-feature level-of-effort was determined based upon proximity to structures and other pits. Special attention was given to clusters of pits in relation to the structures, with the assumption that such clusters could represent activity areas associated with the occupation of a certain structure or group of structures. We systematically excavated 54 percent (11 were partially excavated, and 7 were fully excavated) of the 33 extramural-pit features (see Table 80). Investigation of the 13 examined features did not result in identification of additional human remains at Site 68.

The 35 extramural features at Site 68 were 33 pits, 1 artifact concentration, and 1 burial. The pits were subdivided into subtypes: nonthermal pits (n = 32) and nonthermal bell-shaped pits (n = 1), definitions of which can be found in Chapter 3. The feature description for the burial is located near the end of this chapter, in the Human Burial section. Figure 221 displays the relative locations of the features, and individual characteristics of all partially excavated, fully excavated, and sampled pits are presented in Table 84.

Site 68 Stratigraphy

Site 68 was located on the alluvial fan reach of the Unit III1 drainage network. Trenching revealed numerous upper-fan reach Unit III1 channels incised into Unit I. Features were positioned on the Unit III1 surface and buried by undifferentiated Unit IV/III2cf or Unit V alluvium. Unit III2 alluvial fan reach deposits were identified on the eastern side of the site (see Chapter 2, Volume 2).

Table 83. Characteristics of Examined Pits at Site 68

Feature No.	Type	Dimensions (m)			Plan-View Shape	Cross-Sectional Shape	Charcoal?	Ash?	Cobbles?	FAR?	Oxidized Sediment?
		Length	Width	Depth							
Early to Middle Archaic period											
62	nonthermal pit	0.79	0.67	indeterminate	circular	indeterminate	no	no	no	no	no
63	nonthermal pit	0.64	0.59	indeterminate	circular	indeterminate	no	no	no	no	no
64	nonthermal pit	0.61	0.53	indeterminate	circular	indeterminate	no	no	no	no	no
67	nonthermal pit	0.88	0.73	indeterminate	circular	indeterminate	no	no	no	no	no
Middle to Late Archaic period											
70	nonthermal pit	0.49	0.41	indeterminate	circular	indeterminate	no	no	no	no	no
81	nonthermal pit	0.39	0.35	indeterminate	circular	indeterminate	no	no	no	no	no
158	nonthermal pit	0.55	0.54	indeterminate	circular	indeterminate	no	yes	no	no	no
Late Archaic to Protohistoric period											
89	nonthermal pit	0.38	0.37	indeterminate	circular	indeterminate	no	no	no	no	no
90	nonthermal pit	0.42	0.38	indeterminate	circular	indeterminate	no	no	no	no	no
91	nonthermal pit	0.41	0.41	indeterminate	circular	indeterminate	no	no	no	no	no
92	nonthermal pit	0.34	0.29	indeterminate	circular	indeterminate	yes	no	no	no	no
93	nonthermal pit	0.38	0.31	indeterminate	circular	indeterminate	yes	yes	no	no	no
94	nonthermal pit	0.3	0.28	indeterminate	circular	indeterminate	no	yes	no	no	no

Table 84. Characteristics of Excavated or Sampled Extramural Pits at Site 68

Feature No.	Pit Type	Level of Effort	Plan-View Shape	Cross-Sectional Shape	Charcoal	Ash	Oxidized Sediment	FAR	Dimensions (m)			Excavated Volume (m^3)	Collected Artifacts				
									Length	Width	Depth		Flaked Stone	Ground Stone	Faunal Remains	Ceramic Artifacts	Total
Early to Middle Archaic period																	
71	nonthermal	complete	circular	basin	yes	yes	yes	no	0.51	0.50	0.12	0.13	—	—	—	—	—
Middle to Late Archaic period																	
11	nonthermal	sampled	IND	irregular	yes	no	yes	no	0.46	IND	0.26	IND	—	—	1	—	1
17	nonthermal	sampled	IND	basin	yes	no	no	no	1.58	IND	0.62	IND	—	—	—	—	—
65	nonthermal	complete	circular	basin	yes	no	yes	yes	1.70	1.60	0.16	1.82	—	—	2	—	2
75	nonthermal	partial	IND	basin	no	no	no	no	0.71	IND	0.10	IND	—	—	—	—	—
87	nonthermal	complete	circular	basin	yes	yes	no	no	0.80	0.74	0.20	0.50	—	—	2	—	2
142	nonthermal bell shaped	complete	circular	bell	no	no	yes	yes	1.37	1.10	1.20	0.95	—	—	—	—	—
146	nonthermal	partial	circular	basin	no	yes	no	no	0.60	0.52	0.07	0.04	—	—	—	—	—
147	nonthermal	complete	circular	conical	yes	no	no	no	0.77	0.75	0.32	0.39	1	—	—	—	1
148	nonthermal	partial	circular	conical	yes	yes	no	no	0.80	0.80	0.38	0.51	—	—	1	—	1
157	nonthermal	partial	circular	conical	yes	no	no	no	0.60	0.60	0.53	0.40	—	—	—	—	—
Late Archaic to Protohistoric period																	
68	nonthermal	complete	IND	basin	yes	no	no	no	0.54	IND	0.16	IND	—	—	2	—	2
73	nonthermal	partial	circular	basin	no	yes	no	no	0.70	0.70	0.19	0.19	—	—	—	—	—
74	nonthermal	partial	ovate	basin	no	no	no	no	1.16	0.84	0.08	0.20	—	—	—	—	—
79	nonthermal	partial	circular	basin	yes	yes	no	no	0.71	0.68	0.20	0.20	—	—	—	—	—
84	nonthermal	partial	ovate	irregular	yes	no	no	no	1.22	0.70	0.14	0.20	—	—	—	—	—
95	nonthermal	partial	circular	basin	yes	no	no	no	0.65	0.62	0.50	0.42	—	—	—	—	—
96	nonthermal	partial	circular	basin	yes	no	no	no	0.59	0.54	0.09	0.06	—	—	—	—	—
206	nonthermal	complete	ovate	irregular	yes	yes	yes	no	0.93	0.68	0.72	1.91	1	—	1	—	2
Snaketown phase																	
97	nonthermal	partial	circular	conical	yes	yes	yes	yes	0.56	0.52	0.46	0.28	—	—	—	—	—

Key: IND = indeterminate

Feature Descriptions

This section of the chapter details the excavation methodology and feature descriptions for partially and fully excavated features, including architectural features, extramural features, and the human burial. The following feature descriptions are arranged by feature type, then chronological component. As described above, several groups of spatially associated features were investigated during Phase 2. In the following feature descriptions, the section Stratigraphic Relationship and Associated Features summarizes spatially associated and potentially contemporary features within a 10-m radius of the feature being described. Features at Site 68 were assigned to four chronological groups: the Early to Middle Archaic period, the Middle to Late Archaic period, the Late Archaic to Protohistoric period, and the Snaketown phase of the Pioneer period.

Architecture

Both of the structures identified at Site 68 were in close proximity to one another (see Figure 221), but based on geochronologic and radiocarbon analyses, they were not contemporary. Both structures at Site 68 are considered house-in-pit-style structures. Although the exact dimensions of Feature 13 are unknown, both features were likely circular to oval in plan view and were constructed in pits that measured at least 0.18 m deep. Because of the lack of visible postholes, it was difficult to interpret entryways and to determine whether the structures had been built within or over the pits. Both structures had simple earthen floors and 1–2 intramural pits each. No architectural debris was evident, and neither structure was found to contain a hearth or any artifacts. Overall, these structures are best interpreted as representing ephemeral pole-and-brush, pole-and-grass, or pole-and-mat structures.

Middle to Late Archaic Period Component

A single structure (Feature 88) at Site 68 was assigned to the Middle to Late Archaic period.

Feature 88

Feature type: house-in-pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: A1
Level of effort: complete
Plan-view shape: circular
Cross-sectional shape: basin

Total floor area (m^2): 4.4
Effective floor area (m^2): 4.0
Orientation: indeterminate
Length (m): 2.7
Width (m): 2.2
Excavated depth (m): 0.18
Volume (m^3): 2.42

Excavation Methods

Feature 88 was a possible house-in-pit that dated to the Middle to Late Archaic period. It was identified during the mechanical excavation of MSU 58 (see Figure 221), appearing as a large, circular, organic, ashy stain. A 1-by-1-m control unit (TP 99) was first hand-excavated within the center of the stain. The remainder of the structure fill was then manually removed in two sections; SEC 139 encompassed the northern part of the feature, and SEC 144 encompassed the southern part (Figure 222).

A single stratum was present within the structure. The control unit (TP 99) and the sections (SECs 139 and 144) were excavated in two levels: Level 1 (fill) was arbitrarily defined, and Level 2 (floor fill) ended upon reaching the structure floor, which consisted of a relatively compact, continuous, and hard surface. Flotation, pollen, and ^{14}C samples were recovered from both levels of TP 99. Additional pollen and ^{14}C samples were recovered from both levels of SEC 139, and additional flotation samples were collected from Level 2 of both sections and from Level 1 of SEC 144. Two pollen samples were also recovered from the floor.

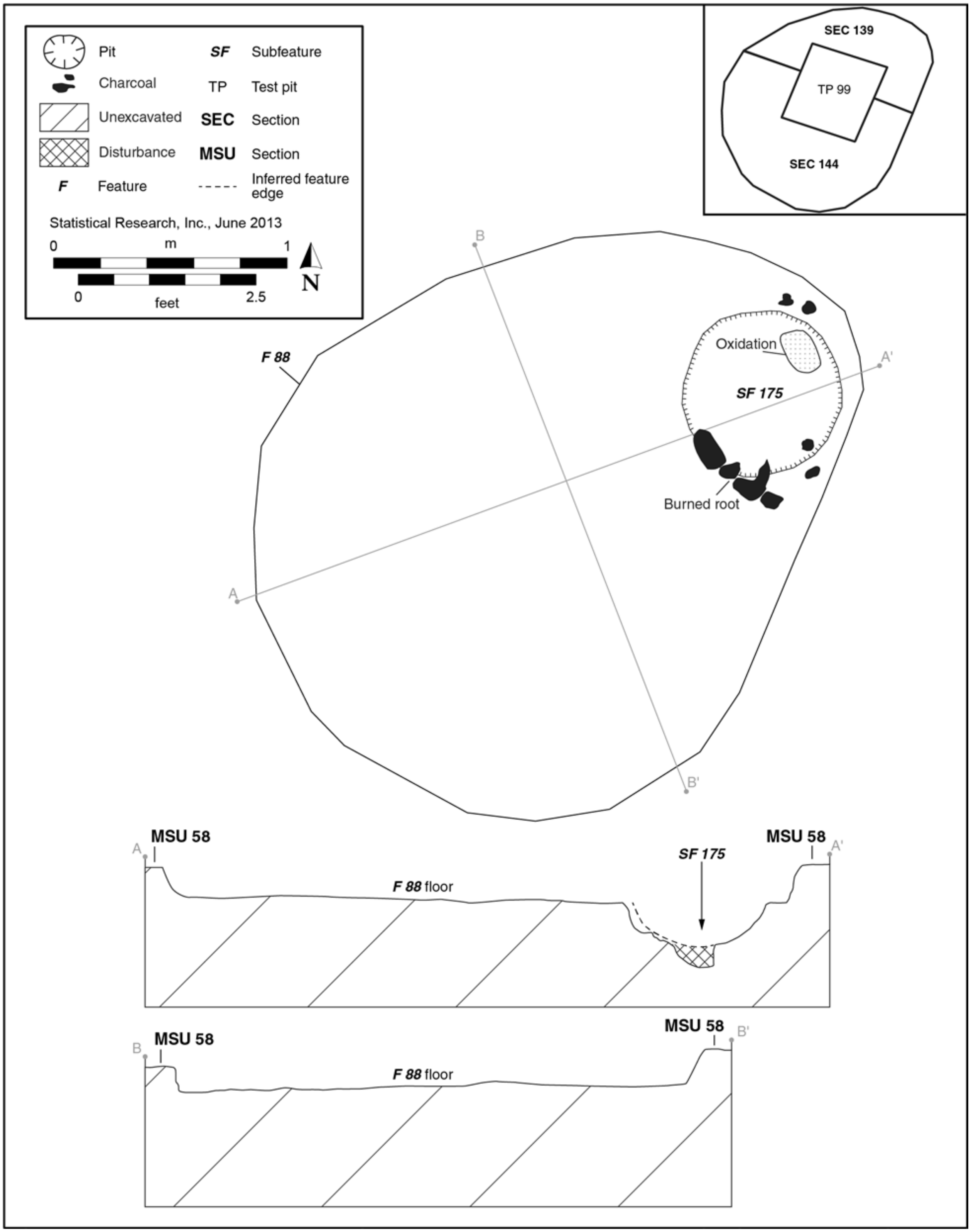


Figure 222. Plan view and profile of Feature 88.

Feature Fill

The structure fill consisted of a massive deposit of light-yellowish-brown silt clay loam mottled with light-brown sediment fragments and charcoal flecking. The light-brown sediment fragments were softer and less blocky than the surrounding light-yellowish-brown sediment. No water-lain or windblown lamina was apparent. Seven pieces of unworked faunal bone were present in Level 2 of SEC 139. Charcoal recovered from the Level 2 floor fill was submitted for species identification (see Chapter 7, Volume 2). The structure fill was impacted throughout by moderate root, insect, and animal disturbance. A large burned root was also found within the structure fill, near the eastern pit wall.

Construction Details

Walls and Roof

Feature 88 was built either in or around a circular pit that was at least 0.18 m deep (Figure 223). Whether the structure was in or surrounding the pit was impossible to interpret, because no wall postholes were identified. In addition, because architectural debris was not present within the structure fill, little can be said about the structure walls and roof. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The structure floor consisted of the natural substrate but displayed noticeable use compaction. No artifacts were found in contact with the floor, but a pollen sample recovered from the surface was submitted for analysis (see Chapter 8, Volume 2).

Figure 223. Overview photograph of Feature 88.

Entry
An entryway was not discernible.

Interior Features
A single intramural pit (Subfeature 175) originated at the structure floor (see Figure 222). The pit was unburned, basin shaped in cross section, and 0.14 m deep. It was circular in plan view and measured 0.63 by 0.70 m. Subfeature 175 was divided into two sections (SECs 176 and 178), and each section was excavated in one stratigraphic level. A flotation sample was collected from each section, and the remaining fill was screened through 1/4-inch mesh. A pollen sample was also scraped from the base of the pit in SEC 178. The fill was of the same color and consistency as the structure fill, indicating that the pit was filled at the same time as the structure. The large burned root first discovered in the fill of the structure also intruded into this pit. Associated patches of oxidation were noted throughout the pit fill and on the pit walls and base. A single piece of unworked faunal bone was present in the pit fill.

Evidence of Remodeling
No obvious evidence of remodeling was found.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 88 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The lack of artifacts in contact with the structure floor suggests that the structure was cleaned prior to abandonment. The mottled coloration of the structure fill and the lack of evidence for windblown and water-lain deposits in the lower fill suggest that the structure was dismantled and that the pit was filled in a massive episode. Perhaps the mottled coloration of the fill is indicative of decomposed architectural material. The small amount of charcoal in the fill and the absence of oxidation and charcoal staining on the floor indicate that the structure did not burn.

Stratigraphic Relationships and Associated Features
Three features are spatially associated with and in the same stratigraphic position as Feature 88 (within Unit III1): nonthermal-pit Features 65, 70, and 87 (see Figure 221). Based on geochronologic dating, the feature dates to the Middle to Late Archaic period (1380–920 cal. B.C.); it was not dated in any other manner. Feature 88 was not in direct contact with any features.

Snaketown Phase Component

A single structure (Feature 13) at Site 68 was assigned to the Snaketown phase.

Feature 13

Feature type: house-in-pit
Age: Snaketown phase
Locus: Area B
Grid location: A1
Level of effort: complete
Plan-view shape: indeterminate
Cross-sectional shape: basin

Total floor area (m^2): indeterminate
Effective floor area (m^2): indeterminate
Orientation: indeterminate
Length (m): indeterminate
Width (m): 1.6
Excavated depth (m): 0.2
Volume (m^3): indeterminate

Excavation Methods

Feature 13 was a Snaketown phase house-in-pit. The structure was identified in profile during the mechanical excavation of TR 7 (see Figure 218), and the plan of the feature was later exposed in the excavation of MSU 58 (see Figure 221). Upon exposure, it became evident that the southern extent of the feature had been removed by TR 7 (Figure 224). A 1-by-1-m control unit (TP 159) was hand-excavated within the center of the structure. The remainder of the structure fill was then manually removed in four sections (SECs 180, 183, 185, and 187) (see Figure 224).

The control unit and sections ended upon exposure of the structure floor, which consisted of a relatively compact, continuous, and hard surface. TP 159 was excavated in three levels representing two cultural strata. Levels 1 and 2 corresponded to the upper stratum. Level 1 (fill) was terminated arbitrarily, and Level 2 (fill) ended upon exposure of another stratum. Level 3 (floor fill) corresponded to the lower stratum, which rested in contact with the structure floor. Flotation, pollen, and ^{14}C samples were collected from each level of TP 159.

Sections 180, 183, 185, and 187 were excavated in two stratigraphic levels; Level 1 (fill) corresponded to the upper stratum, and Level 2 (floor fill) corresponded to the lower stratum. Flotation and pollen samples were collected from the first level of each section but were omitted from the second level because of the fine nature of the charcoal, and to avoid redundancy with the samples collected from TP 159.

Feature Fill

Two distinct strata were present in the fill of Feature 13; both were a brown silt clay loam, but the lower stratum was slightly lighter in color. Each stratum contained fine lamination consistent with windblown and water-lain deposition. The upper stratum contained fine charcoal flecks as well as some larger charcoal fragments. The lower stratum also contained fine charcoal flecking but was looser than the upper stratum. Pollen and charcoal (macrobotanical) samples from both strata were submitted for analyses (see Chapters 7 and 8, Volume 2).

Faunal bone was the only artifact type present within either stratum. It included a variety of very-small-, small-, medium-, large-, and very-large-mammal bone. Nine specimens were identified in total. The most identifiable bones were canid (large), rodent (small and very small), and snake. No cut marks were identified, but the rodent and snake bones and two indeterminate small-mammal bones were burned. All but one specimen were identified in the upper stratum. Both strata were moderately disturbed by roots and insect burrowing.

Construction Details

Walls and Roof

Although only two wall postholes were identified within Feature 13 (Subfeatures 242 and 244), their location along the interior pit edge suggests that the structure was built within the pit (Figure 225; see Figure 224). Both wall postholes were circular in plan view and cylindrical in cross section and measured between 0.08 and 0.10 m in diameter and between 0.02 and 0.04 m in depth (Table 85). One additional posthole (Subfeature 240) was also present, near the center of the structure, and possibly represented a central support posthole. It was circular in plan view and slightly belled at the base, measuring 0.19 by 0.16 m in diameter and 0.20 cm in depth (see Table 85). The fill of each posthole was similar to the structure fill, including the charcoal flecking. Charcoal from the fill of Subfeature 240 was submitted for species identification (see

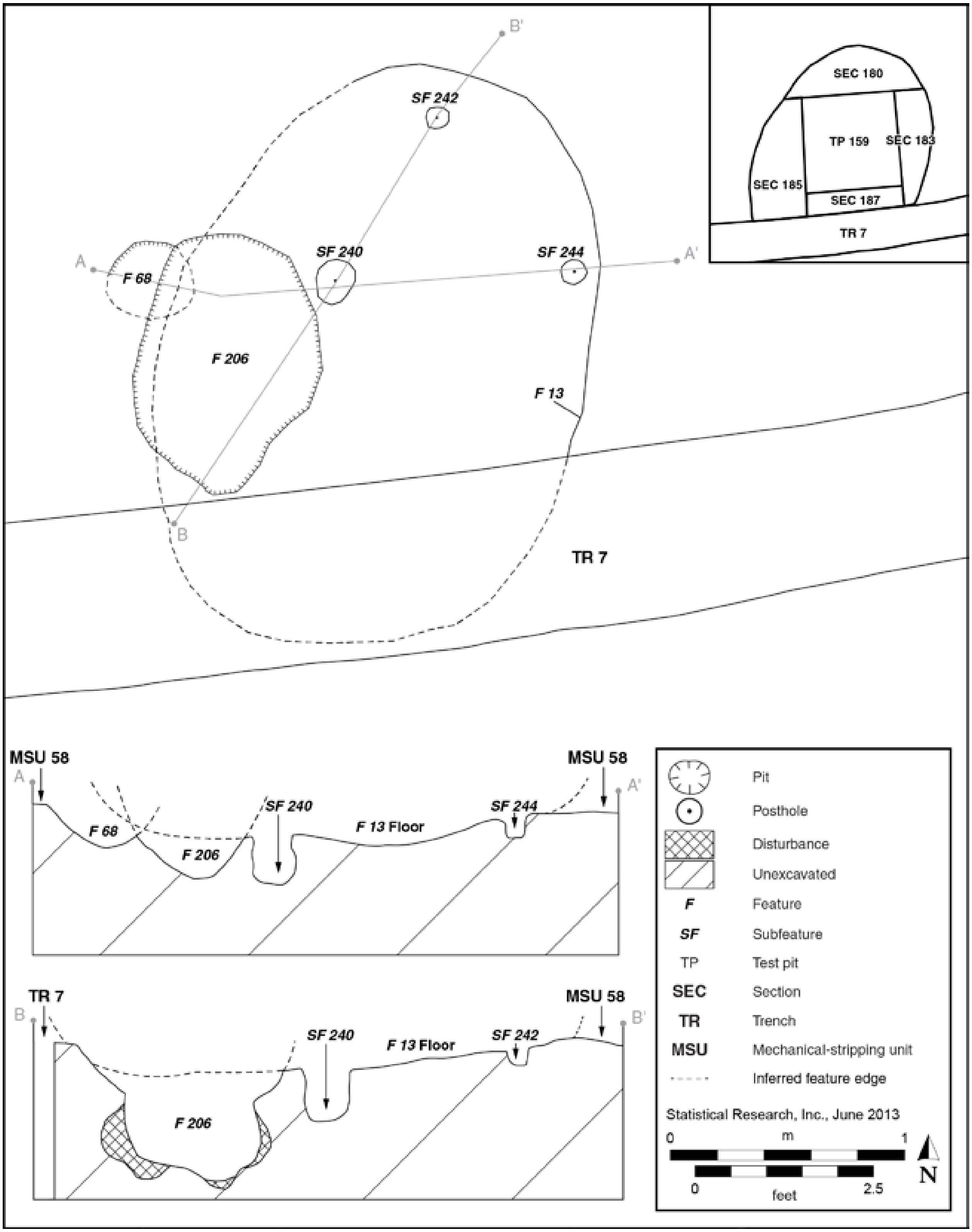


Figure 224. Plan view and profile of Feature 13.

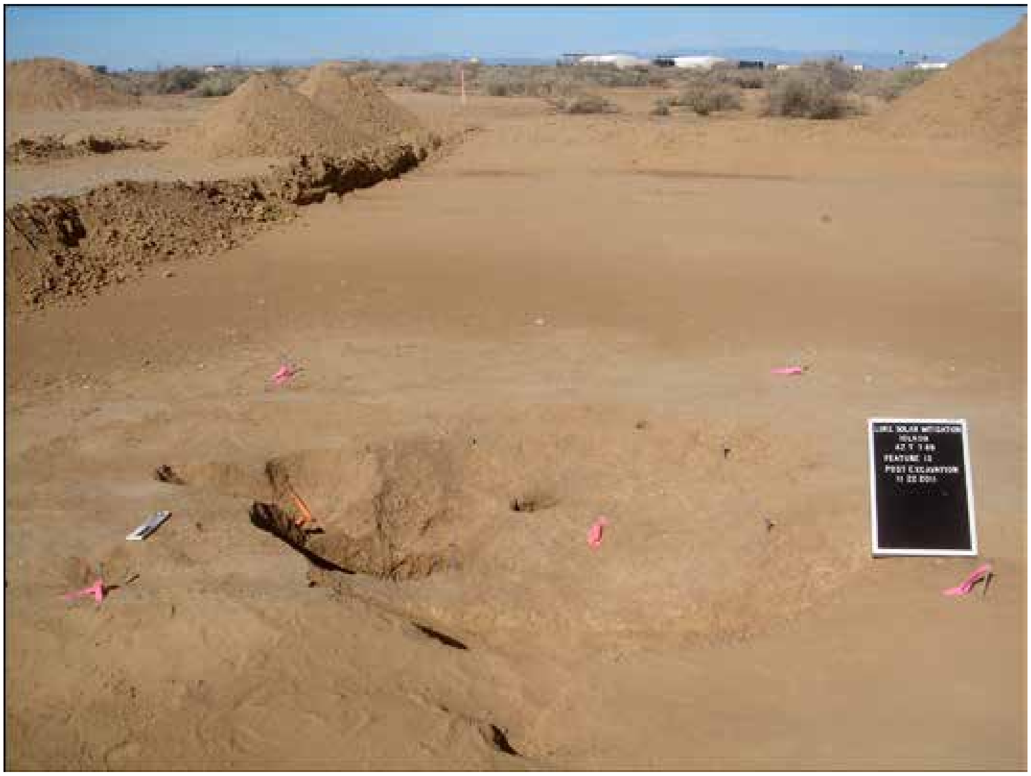


Figure 225. Overview photograph of Feature 13.

Table 85. Intramural Features in Feature 13 at Site 68

Subfeature No.	Type	Plan-View Shape	Cross-Sectional Shape	Length (m)	Width (m)	Depth (m)	Volume (m^3)
240	posthole	circular	bell	0.19	0.16	0.20	0.0061
242	posthole	circular	cylindrical	0.09	0.08	0.04	0.0003
244	posthole	circular	cylindrical	0.10	0.10	0.02	0.0002

Chapter 7, Volume 2). Besides the characteristics of the three postholes, little can be said about the structure walls and roof, because no architectural debris was present within the structure fill. Perhaps the lack of postholes and architectural debris is indicative of the impermanent nature of the structure.

Floor

The floor of the structure consisted of the natural substrate, which displayed noticeable use compaction and was stained from charcoal and ash. No artifacts were found in contact with the floor.

Entry

An entryway was not discernible.

Interior Features

None.

Evidence of Remodeling

No evidence of remodeling was present.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 13 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2).

Radiocarbon Analysis
A fragment of mesquite (*Prosopis* sp.) charcoal recovered from the floor fill (Level 3, TP 159) was submitted to Aeon Laboratories (Sample No. 1546) for AMS dating and returned a 2σ calibrated date range of cal. A.D. 650–780 (see Chapter 2, Volume 2). This date range places the use of the structure in the Snaketown phase of the Pioneer period (A.D. 400–750).

Abandonment Processes
The lack of artifacts in contact with the structure floor suggests that the structure had a planned abandonment. Both strata associated with the structure fill contained laminae indicative of windblown and water-lain deposits, suggesting that the structure may have been dismantled and the residual pit left open, subsequently filling with naturally deposited sediments. Perhaps the lighter coloration and softer consistency of the lower stratum were partially associated with dismantling or deterioration of the structure. The sparse amount of charcoal in both strata and the absence of oxidation on the floor suggest that the structure did not burn.

Stratigraphic Relationships and Associated Features
Two features are spatially associated with and in the same stratigraphic position as Feature 13 (at the Unit III1 surface, overlain by Unit V) (see Figure 221): thermal-pit Feature 206 and nonthermal-pit Feature 68. Based on geochronologic dating, they date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520). Feature 206 was intrusive to Feature 68, and both were intrusive to the structure, Feature 13 (Figure 226). Neither of the features underwent any additional dating.

Extramural Features

The 20 complete or partially excavated extramural features at Site 68 were 17 nonthermal pits, 1 nonthermal bell-shaped pit, 1 artifact concentration, and 1 burial. Figure 221 shows the relative locations of these features. The individual characteristics of all excavated and sampled pits are presented in Table 84.

Nonthermal Pits

The sampled or partially or completely excavated nonthermal pits were generally circular in plan view and basin shaped in cross section, and they averaged 0.33 m in depth (see Table 84). The plan-view shapes of other pits were ovate (n = 3) and indeterminate (because of disturbances) (n = 4). Other cross-sectional shapes were conical (n = 4) and irregular (n = 3).

Seventeen of the partially or completely excavated nonthermal pits contained burned material, such as charcoal, ash, or oxidized sediments, in their fill. Only two nonthermal pits (Features 65 and 97) contained FAR. Seven of the pits contained artifacts, including flaked stone and faunal bone. The presence of artifacts and ash-stained sediments in some of the pit features suggests postabandonment use as refuse receptacles; other pits seem to have been left open and filled in naturally. Following are individual descriptions of the 20 partially or completely excavated nonthermal pits at Site 68.

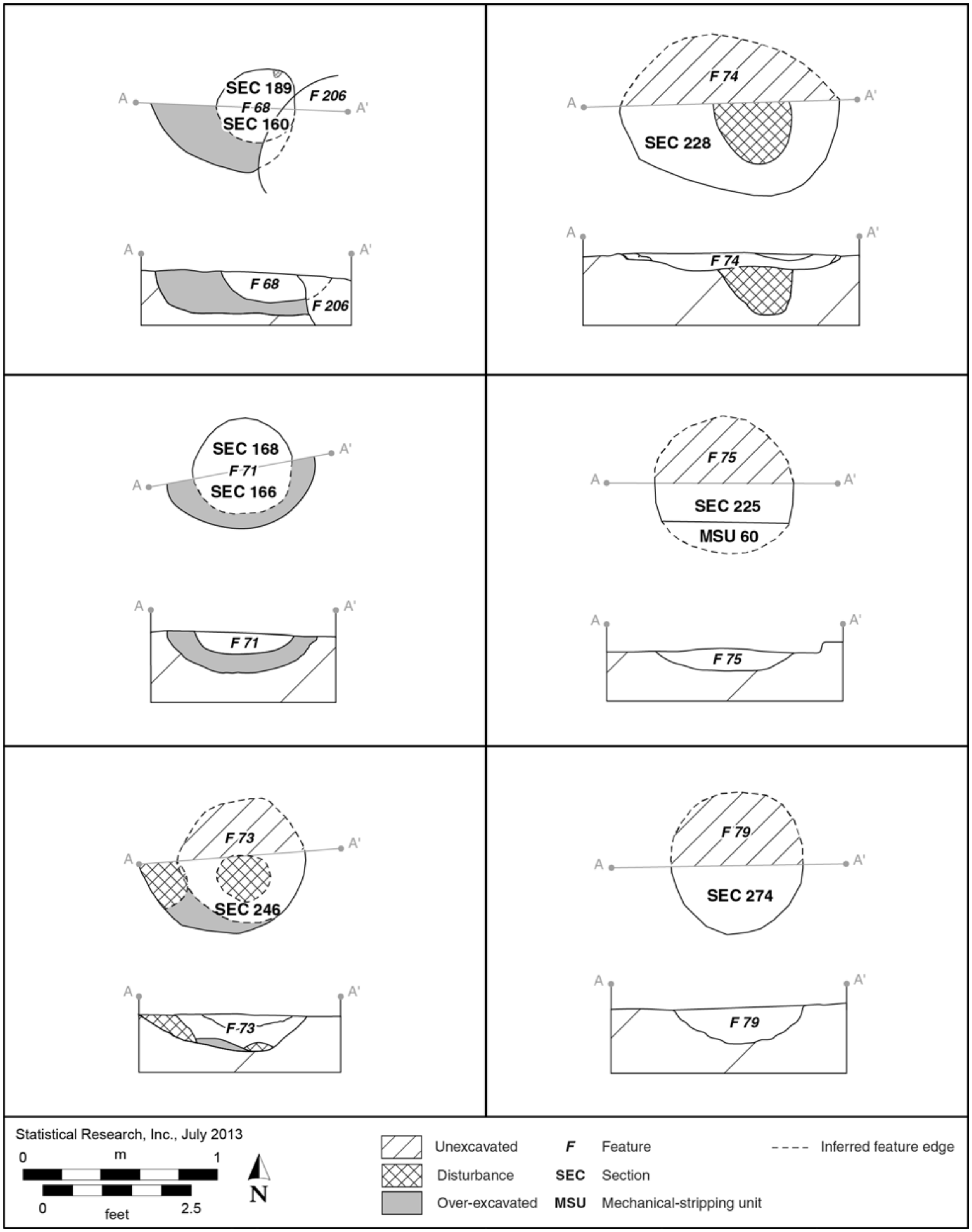


Figure 226. Plan views and profiles of Features 68, 71, 73, 74, 75, and 79.

Early to Middle Archaic Period Component

A single excavated nonthermal pit (Feature 71) at Site 68 was assigned to the Early to Middle Archaic period.

Feature 71

Feature type: nonthermal pit
Age: Early to Middle Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: complete

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.51
Width (m): 0.50
Excavated depth (m): 0.12
Volume (m^3): 0.13

Excavation Methods

Feature 71 was a nonthermal pit identified in MSU 58 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was excavated in two sections. The first, SEC 166, was over-excavated in one arbitrary 1/4-inch-screened level to clearly expose the feature in profile. The second section, SEC 168, was excavated in one stratigraphic 1/4-inch-screened level, to the base of the pit (see Figure 226).

Feature Fill

The pit contained a single stratum, which consisted of a light-yellowish-brown silty clay loam that had been stained from burned organic materials. Small charcoal flecks and oxidized sediment nodules were dispersed throughout, but no artifacts were encountered. A small amount of ash was also noted near the top of the feature. Abundant insect disturbance was documented throughout the fill.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 71 was located at the surface of Unit I. Late Holocene alluvial-fan deposits (Unit III1) overlay the structure. The unconformity between the Unit I surface and the Unit III1 stratum provides a geochronologic date of 5320–1380 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Early to Middle Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

The fill of the feature was massive and appeared to have been deposited in one episode. Based on the amount of charcoal and oxidized sediments in the fill, it was likely deposited around the time of site occupation, and it likely represents intentionally deposited refuse.

Stratigraphic Relationships and Associated Features

Three features are spatially associated with and in the same stratigraphic position as Feature 71 (at the Unit I surface, overlain by Unit III1): nonthermal-pit Features 62, 63, and 67 (see Figure 221). Based on geochronologic dating, all of these features date to the Early to Late Archaic period (5320–1380 cal. B.C.); they were not dated in any other manner. Feature 71 was not in direct contact with any features.

Middle to Late Archaic Period Component

Nine excavated nonthermal pits at Site 68 were assigned to the Middle to Late Archaic period.

Feature 11

Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: sampled

Plan-view shape: indeterminate
Cross-sectional shape: irregular
Length (m): 0.46
Width (m): indeterminate
Excavated depth (m): 0.26
Volume (m^3): indeterminate

Excavation Methods

Feature 11 is a nonthermal pit that was identified in the northern wall of TR 7 (see Figure 218). It appeared in profile as an irregularly shaped pit with charcoal, oxidized sediment, and faunal bone in the fill (see Figure 219). A flotation sample was removed from the pit fill, and the faunal bone was recovered with it. The pit was uncovered in plan view after the excavation of MSU 60 (see Figure 221); no additional excavation took place.

Feature Fill

The pit contains two strata. Specific details regarding the uppermost stratum were not recorded, but the base of the pit is lined with a dense layer of charcoal that surrounds a pocket of oxidized sediments (see Figure 219). The recovered faunal bone is an unburned, unidentifiable cortical mammal-bone fragment.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 11 was located within Unit III1, which provides a geochronologic date of 1380–920 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

Charcoal and oxidized sediments found in the base of the pit may represent the remnants of a primary fuel deposit that was simply left in place. Because the feature was only sampled in the profile, the characteristics of the upper pit fill were not described. The fill could either represent natural deposition or an intentional filling episode.

Stratigraphic Relationships and Associated Features

Several features are spatially associated with Feature 11: nonthermal-pit Features 79, 81, 96, and 97 and artifact-concentration Feature 82 (see Figure 221). Based on geochronologic dating, Feature 81 is the only feature contemporaneous with Feature 11, located within Unit III1. Features 79, 82, and 96 were assigned to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520). Feature 97 was radiocarbon dated to the Snaketown phase (cal. A.D. 670–780). Feature 11 is not in direct contact with any features.

Feature 17

Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: sampled

Plan-view shape: indeterminate
Cross-sectional shape: basin
Length (m): 1.58
Width (m): indeterminate
Excavated depth (m): 0.62
Volume (m³): indeterminate

Excavation Methods

Feature 17 is a nonthermal pit that was identified in the northern and southern walls of TR 14 (see Figure 218). It appeared in profile as a basin-shaped pit with dispersed charcoal flecking throughout the fill (see Figure 220). The pit was uncovered in plan view after the excavation of MSU 60 (see Figure 221); no additional excavation took place.

Feature Fill

The pit fill consists of a single stratum. Because the feature was only sampled in profile, specifics regarding the sediments were not recorded, but based on the profile, two large pieces of charcoal rested upon the pit base (see Figure 220). Artifacts were not present within the profile.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 17 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Middle to Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

Information regarding abandonment processes was not recorded.

Stratigraphic Relationships and Associated Features

One feature is spatially associated with and in the same stratigraphic position as Feature 17 (within Unit III1): nonthermal-pit Feature 75 (see Figure 221). Based on geochronologic dating, the features date to the Middle to Late Archaic period (1380–920 cal. B.C.). Feature 75 was not dated by any other method, and Feature 17 is not in direct contact with any features.

Feature 65

Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: complete

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 1.70
Width (m): 1.60
Excavated depth (m): 0.16
Volume (m³): 1.82

Excavation Methods

Feature 65 was a nonthermal pit identified in MSU 58 (see Figure 221). It appeared in plan view as a circular, organic stain, and based on size, it was thought to possibly be the remains of a small structure; however, subsequent excavation of Feature 65 determined that is was instead a large, shallow, nonthermal pit. A 1-by-1-m test unit (TP 199) was placed within the center of the stain (Figure 227). It was excavated in two 1/4-inch-screened levels; the first was terminated arbitrarily at a depth of 0.12 m, and the second ended within 0.02 m, at the pit base. The remainder of the pit was excavated in two units (SECs 202 and 204) (see Figure 227). Each of these was excavated in a single 1/4-inch-screened stratigraphic level.

Feature Fill

The pit contained a single stratum consisting of a yellowish-brown silty clay loam that was stained from burned organic materials. A moderate amount of charcoal flecking, some FAR, and small pieces of oxidized sediments were present throughout the pit fill, as well as two burned small-mammal and very-small-mammal leg bones.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 65 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Middle to Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

The fill of the feature was massive and appeared to have been deposited in one episode. Because of the amount of charcoal and oxidized sediments in the fill, it was likely intentionally deposited. It should be noted, though, that no thermal features were identified in the immediate area.

Stratigraphic Relationships and Associated Features

Several features are spatially associated with and in the same stratigraphic position as Feature 65 (within Unit III1): structure Feature 88 and nonthermal-pit Features 70 and 87 (see Figure 221). Based on geochronologic dating, all of the features date to the Middle to Late Archaic period (1380–920 cal. B.C.); they were not dated in any other manner. Feature 65 was not in direct contact with any features.

Feature 75

Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: indeterminate
Cross-sectional shape: basin
Length (m): 0.71
Width (m): indeterminate
Excavated depth (m): 0.10
Volume (m^3): indeterminate

Excavation Methods

Feature 75 is a nonthermal pit that was identified in MSU 60 (see Figure 221). It first appeared in plan view as a small, organic stain truncated along the southern edge by MSU 60. The feature was partially excavated in one section (SEC 225), which represented the south-central portion of the pit (the southern portion of the pit was destroyed during mechanical stripping). The section was removed in one 1/4-inch-screened level that was terminated at the base of the feature (see Figure 226).

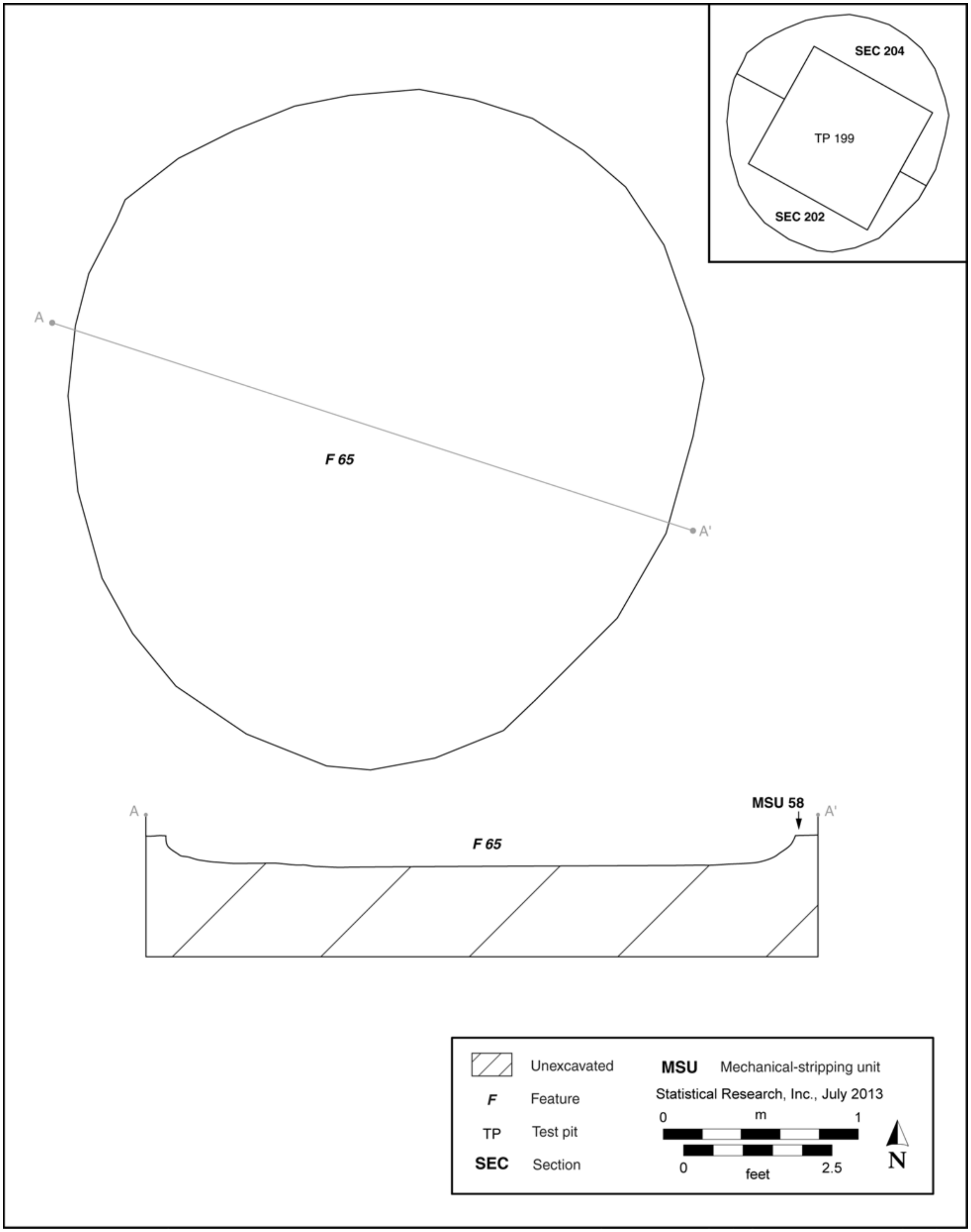


Figure 227. Plan view and profile of Feature 65.

Feature Fill

The pit contains a single stratum that consists of a loosely compacted brown sandy loam. Charcoal, ash, oxidized sediments, and artifacts were not encountered. Other than the previously discussed mechanical disturbance, no additional disturbances were evident.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 75 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Middle to Late Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

Although evidence was not described, the excavator suggested that the fill was representative of natural deposition.

Stratigraphic Relationships and Associated Features

One feature is spatially associated with and in the same stratigraphic position as Feature 75 (within Unit III1): nonthermal-pit Feature 17 (see Figure 221). Based on geochronologic dating, the feature dates to the Middle to Late Archaic period (1380–920 cal. B.C.); it was not dated in any other manner. Feature 75 is not in direct contact with any features.

Feature 87

Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: complete

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.80
Width (m): 0.74
Excavated depth (m): 0.20
Volume (m^3): 0.50

Excavation Methods

Feature 87 was a nonthermal pit identified in MSU 58 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was divided into two equal-sized sections (SECs 101 and 164). Each section was excavated in one $^1/_4$-inch-screened level to the base of the pit (Figure 228).

Feature Fill

The pit contained two strata, both consisting of a dark-brown silty clay loam. The upper stratum was approximately 0.05 m thick and contained numerous fine laminae, and the lower stratum was 0.15 m thick and massive (see Figure 228). Small charcoal fragments and ash were dispersed throughout both strata. One burned seed and two unburned shells (one *Succinea* and one *Mollusca*) were recovered (see Chapters 5 and 7, Volume 2). A minor amount of rodent and insect disturbance was noted throughout.

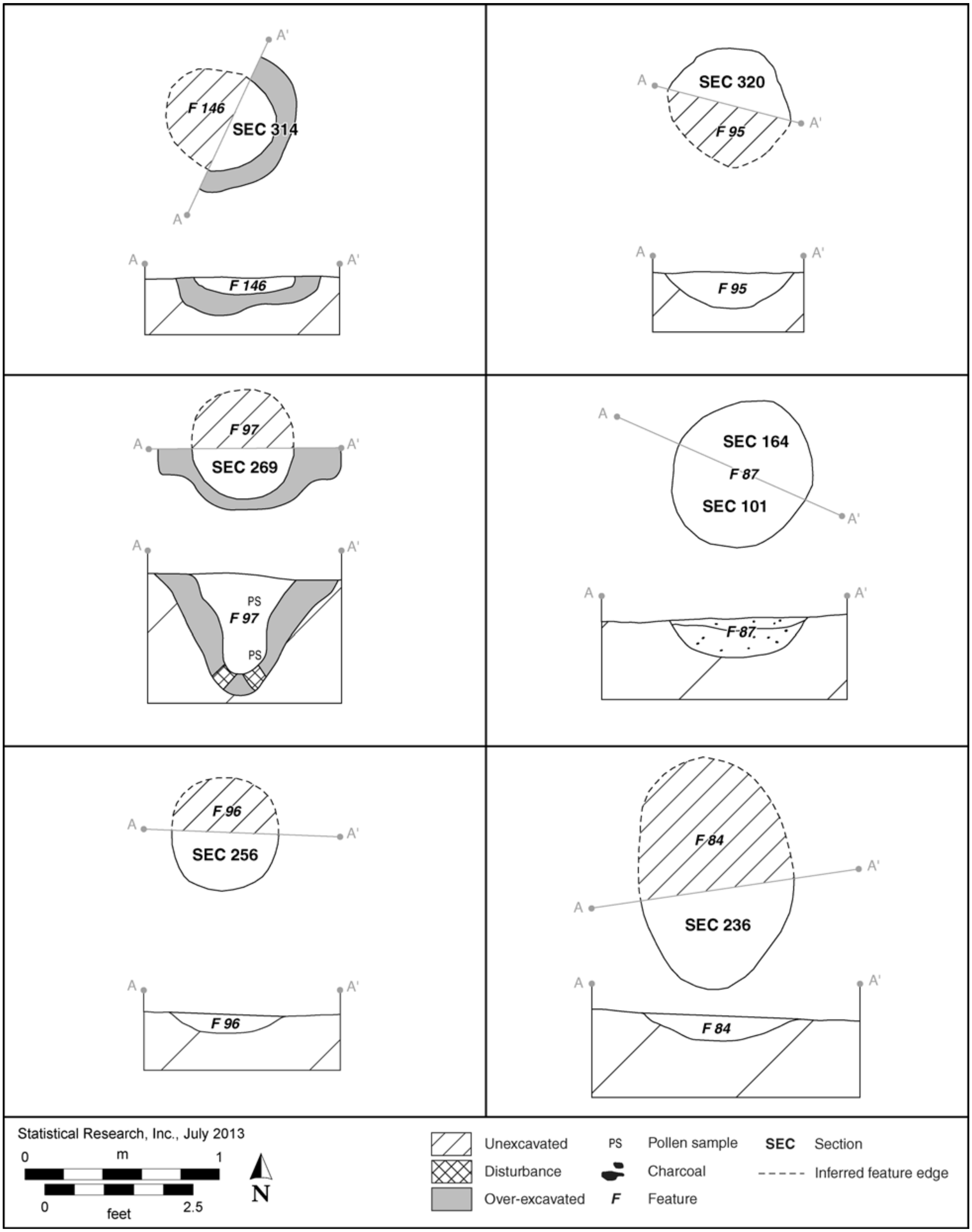


Figure 228. Plan views and profiles of Features 146, 97, 96, 95, 87, and 84.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 87 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The massive fill structure in the base of the pit suggests that it was deposited in one episode. The fine lamina found near the top of the pit indicates that this portion of the pit was left open and had filled over time by natural alluvial or aeolian processes.

Stratigraphic Relationships and Associated Features
Three features are spatially associated with and in the same stratigraphic position as Feature 87 (in Unit III1): nonthermal-pit Features 65 and 70 and a possible house-in-pit, Feature 88 (see Figure 221). Based on geochronologic dating, both of these features date to the Middle to Late Archaic period (1380–920 cal. B.C.); they were not dated in any other manner. Feature 87 was not in direct contact with any features.

Feature 146
Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.60
Width (m): 0.52
Excavated depth (m): 0.07
Volume (m^3): 0.04

Excavation Methods
Feature 146 is a nonthermal pit that was identified in the northwestern portion of MSU 60 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 314), which represents the approximate southern half of the pit. The section was over-excavated in one 1/4-inch-screened, arbitrary level, in order to fully expose the feature in profile (see Figure 228).

Feature Fill
The pit contains a single stratum that consists of a loose grayish-brown silt loam. Ash was noted throughout the fill, but artifacts were not encountered. A small amount of insect disturbance was recorded.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 146 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
A single unstratified layer of ash-stained silt loam is present in Feature 146. The lack of stratigraphy suggests that the pit was filled in one episode rather than through gradual, natural processes. The presence of ash also suggests that the fill was intentionally deposited refuse from a nearby thermal feature.

Stratigraphic Relationships and Associated Features
One feature is spatially associated with and in the same stratigraphic position as Feature 146 (in Unit III1): Feature 142, a nonthermal bell-shaped pit (see Figure 221). Based on geochronologic dating, the feature dates to the Middle to Late Archaic period (1380–920 cal. B.C.); it was not dated in any other manner. Feature 146 is not in direct contact with any features.

Feature 147
Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: complete

Plan-view shape: circular
Cross-sectional shape: conical
Length (m): 0.77
Width (m): 0.75
Excavated depth (m): 0.32
Volume (m^3): 0.39

Excavation Methods
Feature 147, a nonthermal pit, was part of a small cluster of pits in the northern portion of MSU 60 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 251), which represents the approximate southern half of the pit. The section was over-excavated in one 1/4-inch-screened, arbitrary level, in order to fully expose the feature in profile (Figure 229).

Feature Fill
The pit contains two strata. The uppermost stratum was approximately 0.2 m thick and consisted of a dark-yellowish-brown subangular blocky sediment with abundant dispersed charcoal fragments. Laminated bedding was noted near the bottom. The lower stratum was approximately 0.3 m thick and was a highly mottled brown but showed a sharp decrease in charcoal content (see Figure 229). A piece of flaked stone debitage was recovered from the upper stratum, and minor rodent disturbance was noted in both strata.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 147 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

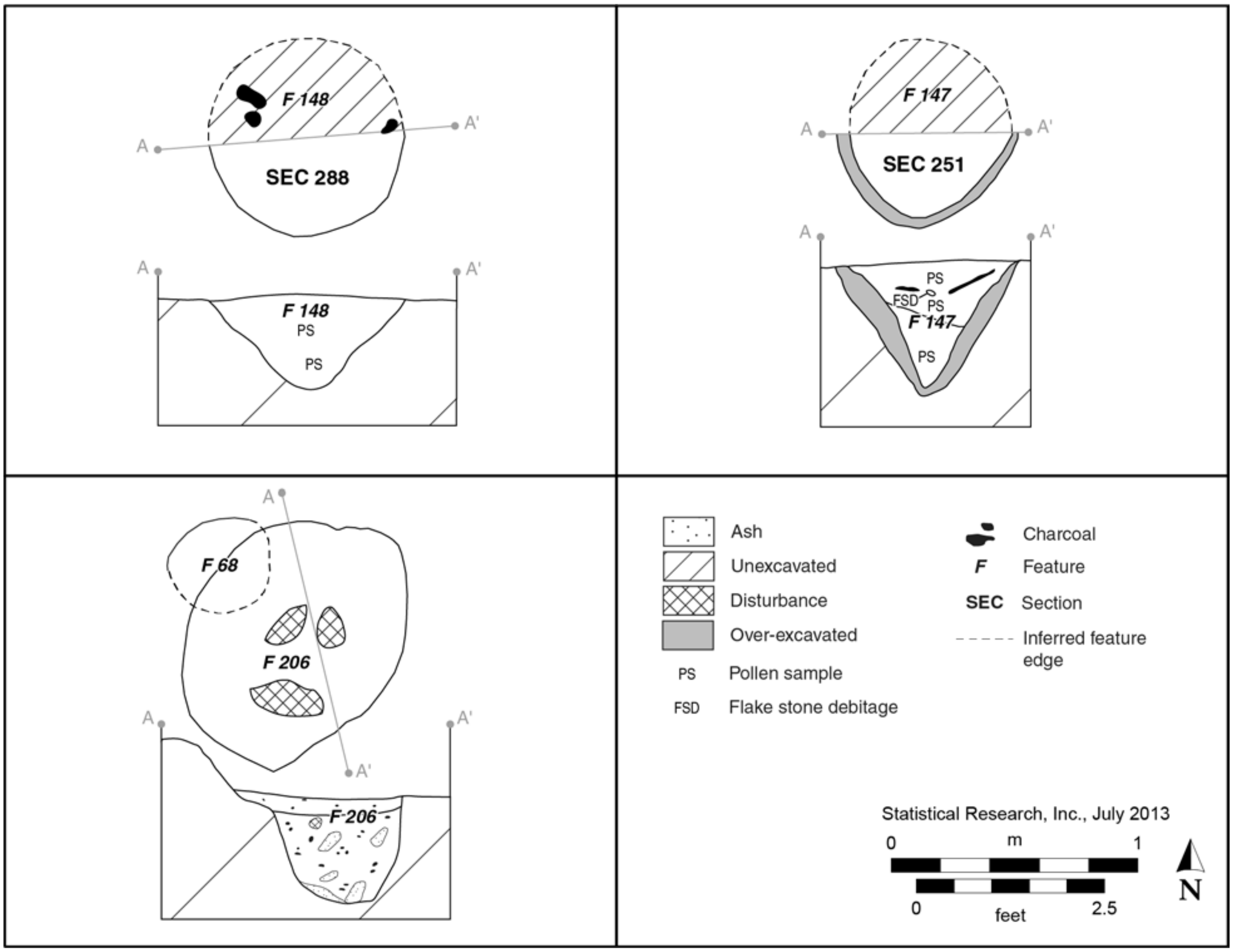


Figure 229. Plan views and profiles of Features 148, 206, and 147.

Abandonment Processes

Based on mottling, the lower portion of the feature seems to have been filled in one episode. The upper portion, though, likely filled in naturally over time, as evidenced in the laminated bedding near the base of the upper stratum.

Stratigraphic Relationships and Associated Features

Three features are spatially associated with and in the same stratigraphic position as Feature 147 (in Unit III1): nonthermal-pit Features 148, 157, and 158 (see Figure 221). Based on geochronologic dating, these features date to the Middle to Late Archaic period (1380–920 cal. B.C.); they were not dated in any other manner. Feature 147 was not in direct contact with any features.

Feature 148

Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: conical
Length (m): 0.80
Width (m): 0.80
Excavated depth (m): 0.38
Volume (m^3): 0.51

Excavation Methods
Feature 148 is a nonthermal pit located within a small cluster of pits in the northern portion of MSU 60 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 288), which represents the approximate southern half of the pit. The section was over-excavated in one 1/4-inch-screened level to the base of the pit (see Figure 229).

Feature Fill
The pit contains a single stratum that consists of a compact brown sandy clay loam. Minimal ash and charcoal flecking were noted throughout the fill, as well as an unburned mouse (*Peromyscus* sp.) humerus. A small amount of insect disturbance was recorded.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 148 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The lack of stratigraphy and the presence of ash and charcoal in the fill of Feature 148 suggest that the pit was intentionally filled with refuse, perhaps in a single episode from a nearby thermal feature.

Stratigraphic Relationships and Associated Features
Three features are spatially associated with and in the same stratigraphic position as Feature 148 (in Unit III1): nonthermal-pit Features 147, 157, and 158 (see Figure 221). Based on geochronologic dating, these features date to the Middle to Late Archaic period (1380–920 cal. B.C.); they were not dated in any other manner. Feature 148 is not in direct contact with any features.

Feature 157
Feature type: nonthermal pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: conical
Length (m): 0.60
Width (m): 0.60
Excavated depth (m): 0.53
Volume (m^3): 0.40

Excavation Methods
Feature 157 is a nonthermal pit located within a small cluster of pits in the northern portion of MSU 60 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 260), which represents the approximate southern half of the pit. The section was over-excavated in one arbitrary, 1/4-inch-screened level, in order to expose the feature in profile (Figure 230).

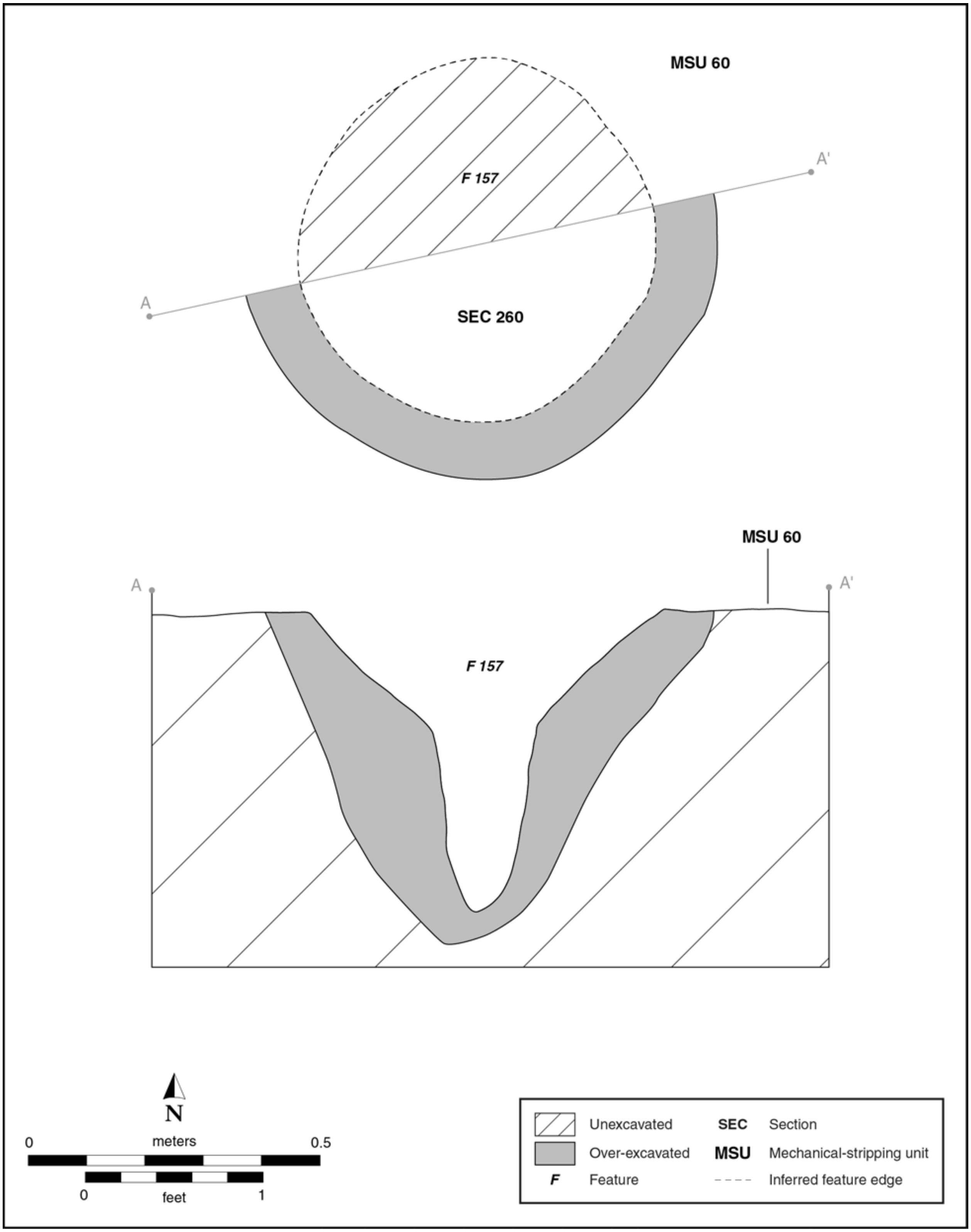


Figure 230. Plan view and profile of Feature 157.

Feature Fill
The pit contains a single stratum that consists of a dark-yellowish-brown silty clay loam. It is more organic than the surrounding natural horizon and also contains a moderate amount of charcoal throughout. Artifacts were not encountered. A moderate amount of insect and plant disturbance was recorded.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 157 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes
The feature fill appeared massive, with no evidence of naturally deposited materials. The pit fill is, therefore, interpreted as a single episode of intentionally deposited refuse, perhaps from a nearby thermal feature.

Stratigraphic Relationships and Associated Features
Three features are spatially associated with and in the same stratigraphic position as Feature 157 (in Unit III1): nonthermal-pit Features 147, 148, and 158 (see Figure 221). Based on geochronologic dating, these features date to the Middle to Late Archaic period (1380–920 cal. B.C.); they were not dated in any other manner. Feature 157 is not in direct contact with any features.

Late Archaic to Protohistoric Period Component

Eight excavated nonthermal pits at Site 68 were assigned to the Late Archaic to Protohistoric period.

Feature 68
Feature type: nonthermal pit
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: not applicable
Level of effort: complete

Plan-view shape: indeterminate
Cross-sectional shape: basin
Length (m): 0.54
Width (m): indeterminate
Excavated depth (m): 0.16
Volume (m^3): indeterminate

Excavation Methods
Feature 68 was a nonthermal pit identified in MSU 58 (see Figure 221). It was identified in plan view during mechanical stripping as a small, organic stain cut by a larger, circular stain to the east (Feature 206). The feature was excavated in two sections. The first, SEC 160, was over-excavated in one arbitrary, 1/4-inch-screened level, to clearly expose the feature in profile. The second, SEC 189, was excavated in one stratigraphic 1/4-inch-screened level to the base of the pit (see Figure 226).

Feature Fill
The pit fill consisted of a massive brown silty clay loam that was stained from burned organic materials. Small charcoal flecks were present throughout, as well as two unburned, small-mammal and very-small-mammal bones.

A pollen sample from the pit base and a charcoal sample (macrobotanical) from the pit fill were submitted for analyses (see Chapters 6 and 7, Volume 2).

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 68 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
The fill of the feature was massive and appeared to have been deposited in one episode. Because of the amount of charcoal in the fill, it was likely deposited around the time of site occupation.

Stratigraphic Relationships and Associated Features
Two features were spatially associated with and in the same stratigraphic position as Feature 68 (at the Unit III1 surface, overlain by Unit V): thermal-pit Feature 206 and structure Feature 13 (see Figure 221). Based on geochronologic dating, these features date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520). Feature 206 was intrusive to Feature 68, and both were intrusive to structure Feature 13 (see Figure 226). The structure was radiocarbon dated to the Snaketown phase (cal. A.D. 650–780). This shortened the geochronologic age range for Feature 68 from 920 cal. B.C.–cal. A.D. 1520 to cal. A.D. 780–1520 (Pioneer to Protohistoric period).

Feature 73

Feature type: nonthermal pit
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.70
Width (m): 0.70
Excavated depth (m): 0.19
Volume (m^3): 0.19

Excavation Methods
Feature 73 is a nonthermal pit that was identified in MSU 60 (see Figure 221). It was identified in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 246), which represented the approximate southern half of the pit. The section was removed in one 1/4-inch-screened level that was terminated at the base of the feature (see Figure 226).

Feature Fill
The pit fill consists of two strata. The uppermost stratum is approximately 0.08 m thick and consists of loose, ashy, yellowish-brown, fine- to medium-grained, laminated sands. The lower stratum is approximately 0.1 m thick and is a compact reddish-brown sandy silt that has been heavily disturbed by insects (see Figure 226). Artifacts were not encountered within either stratum. Several rodent burrows were noted in the base of the pit.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 73 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
The laminated sands that formed the upper stratum indicate that the pit was left open at the time of abandonment and has filled naturally, in increments, with either windblown or water-lain sediments. No individual laminae were identified in the lower stratum, suggesting that it was one massive deposit. Therefore, it seems that the pit was partially filled soon after abandonment, left open for a period of time, and later completely filled by natural alluvial processes.

Stratigraphic Relationships and Associated Features
Six features are spatially associated with and in the same stratigraphic position as Feature 73 (at the Unit III1 surface, overlain by Unit V): nonthermal-pit Features 74, 84, 89–91, and 93 (see Figure 221). Based on geochronologic dating, all of these features date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520); they were not dated in any other manner. Feature 73 is not in direct contact with any features.

Feature 74
Feature type: nonthermal pit
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: ovate
Cross-sectional shape: basin
Length (m): 1.16
Width (m): 0.84
Excavated depth (m): 0.08
Volume (m^3): 0.20

Excavation Methods
Feature 74 is a nonthermal pit that was identified in MSU 60 (see Figure 221). It first appeared in plan view as a small, ovate, organic stain. The feature was partially excavated in one section (SEC 228), which represents the approximate southern half of the pit. The section was removed in one 1/4-inch-screened level that was terminated at the base of the feature (see Figure 226).

Feature Fill
The pit contains two strata. The uppermost stratum is approximately 0.04 m thick and consists of loose yellowish-brown, fine-grained, laminated sands. The lower stratum is approximately 0.09 m thick and is a moderately loose brown sandy silt that has been heavily disturbed by rodents and insects (see Figure 226). Artifacts were not encountered within either stratum. A rodent burrow was noted in the base of the pit.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 74 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
The fine lamina within the uppermost stratum indicates that it was a series of natural deposits. No lamina was identified in the lower stratum, which suggests that it was one massive deposit. Therefore, it seems that the pit was partially filled soon after abandonment and was later completely filled by natural alluvial processes.

Stratigraphic Relationships and Associated Features
Five features are spatially associated with and in the same stratigraphic position as Feature 74 (at the Unit III1 surface, overlain by Unit V): nonthermal-pit Features 73, 84, 89, 90, and 91 (see Figure 221). Based on geochronologic dating, all of these features date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520); they were not dated in any other manner. Feature 74 is not in direct contact with any features.

Feature 79
Feature type: nonthermal pit
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.71
Width (m): 0.68
Excavated depth (m): 0.20
Volume (m^3): 0.20

Excavation Methods
Feature 79 is a nonthermal pit identified in MSU 60 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 274), which represents the approximate southern half of the pit. The section was removed in one 1/4-inch-screened level that was terminated at the base of the feature (see Figure 226).

Feature Fill
The pit contains a single stratum that consists of a yellowish-brown sandy loam. Charcoal and small pockets of ash were noted within the fill, but artifacts were not encountered. A minor amount of plant and insect disturbance was documented.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 79 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
The absence of stratigraphy within the fill of Feature 79 suggests that the pit was filled in one massive deposit. The presence of charcoal and small pockets of ash suggests that the fill was intentionally deposited with refuse, perhaps from a nearby thermal feature.

Stratigraphic Relationships and Associated Features
Two features are spatially associated with and in the same stratigraphic position as Feature 79 (at the Unit III1 surface, overlain by Unit V): nonthermal-pit Feature 11 and artifact concentration Feature 82 (see Figure 221). Based on geochronologic dating, both of these features date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520); they were not dated in any other manner. Feature 79 is not in direct contact with any features.

Feature 84

Feature type: nonthermal pit
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: ovate
Cross-sectional shape: irregular
Length (m): 1.22
Width (m): 0.70
Excavated depth (m): 0.14
Volume (m^3): 0.20

Excavation Methods
Feature 84 is a nonthermal pit that was identified in MSU 60 (see Figure 221). It first appeared in plan view as a small, ovate, organic stain. The feature was partially excavated in one section (SEC 236), which represents the approximate southern half of the pit. The section was removed in one 1/4-inch-screened level that was terminated at the base of the feature (see Figure 228).

Feature Fill
The pit contains a single stratum that consists of a dark-yellowish-brown sandy loam. Charcoal flecking was noted throughout the fill, but artifacts were not encountered. A significant amount of rodent, plant, and insect disturbance was present throughout, as well as two burned roots.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 84 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

Radiocarbon Analysis
None.

Abandonment Processes
The absence of stratigraphy within the fill of Feature 84 suggests that the pit was filled in one massive deposit. The presence of charcoal suggests that the fill was intentionally deposited with refuse, perhaps from

a nearby thermal feature. Alternatively, the pit may have been filled through natural alluvial process, during which charcoal may have been redeposited from another part of the site.

Stratigraphic Relationships and Associated Features

Six features are spatially associated with and in the same stratigraphic position as Feature 84 (at the Unit III1 surface, overlain by Unit V): nonthermal-pit Features 73, 74, 89–91, and 93 (see Figure 221). Based on geochronologic dating, Features 73 and 74 date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520); they were not dated in any other manner. Feature 84 is not in direct contact with any features.

Feature 95

Feature type: nonthermal pit
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.65
Width (m): 0.62
Excavated depth (m): 0.50
Volume (m^3): 0.42

Excavation Methods

Feature 95 is a nonthermal pit that was identified in the east-central portion of MSU 60 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 320), which represents the approximate southern half of the pit. The section was removed in one 1/4-inch-screened level that was terminated at the base of the feature (see Figure 228).

Feature Fill

The pit contains a single stratum that consists of a well-compacted silt loam. A sparse amount of charcoal was noted throughout the fill, but artifacts were not encountered. Minor root disturbance was also noted.

Chronometric Data

<u>**Diagnostic Material Culture**</u>

None.

<u>**Geochronologic Analysis**</u>

Feature 95 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

<u>**Radiocarbon Analysis**</u>

None.

Abandonment Processes

The absence of stratigraphy within the fill of Feature 95 suggests that the pit was filled with one massive deposit. The presence of charcoal suggests that the fill was intentionally deposited with refuse, perhaps from a nearby thermal feature. Alternatively, the pit may have been filled through natural alluvial process, during which charcoal was redeposited from another part of the site.

Stratigraphic Relationships and Associated Features

One feature was spatially associated with and in the same stratigraphic position as Feature 95 (at the Unit III1 surface, overlain by Unit V): artifact-concentration Feature 82 (see Figure 221). Based on geochronologic dating, the feature dates to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520); it was not dated in any other manner. Feature 95 is not in direct contact with any features.

Feature 96

Feature type: nonthermal pit	**Plan-view shape**: circular
Age: Late Archaic to Protohistoric period	**Cross-sectional shape**: basin
Locus: Area B	**Length (m)**: 0.59
Grid location: not applicable	**Width (m)**: 0.54
Level of effort: partial	**Excavated depth (m)**: 0.09
	Volume (m^3): 0.06

Excavation Methods

Feature 96 is a nonthermal pit that was identified in the east-central portion of MSU 60 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 256), which represents the approximate southern half of the pit. The section was removed in one 1/4-inch-screened level that was terminated at the base of the feature (see Figure 228).

Feature Fill

The pit contains a single stratum that consists of a dark-yellowish-brown sandy loam. A sparse amount of charcoal was noted throughout the fill, but artifacts were not encountered. A significant amount of insect disturbance was recorded, and a concentration of charcoal near the top of the pit may be the product of a burned root.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 96 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the pit. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

Radiocarbon Analysis

None.

Abandonment Processes

The absence of stratigraphy within the fill of Feature 95 suggests that the pit was filled in one massive deposit. The presence of charcoal suggests that the fill was intentionally deposited with refuse, perhaps from a nearby thermal feature. Alternatively, the pit may have filled through natural alluvial processes, during which charcoal may have been redeposited from another part of the site.

Stratigraphic Relationships and Associated Features

One feature is spatially associated with and in the same stratigraphic position as Feature 96 (at the Unit III1 surface, overlain by Unit V): nonthermal-pit Feature 94 (see Figure 221). Based on geochronologic dating, the feature dates to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520); it was not dated in any other manner. Feature 96 is not in direct contact with any features.

Feature 206

Feature type: nonthermal pit
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: not applicable
Level of effort: complete

Plan-view shape: ovate
Cross-sectional shape: irregular
Length (m): 0.93
Width (m): 0.68
Excavated depth (m): 0.72
Volume (m^3): 1.91

Excavation Methods

Feature 206 was a nonthermal pit in MSU 58. It was intrusive to Features 13 and 68 (see Figure 221). The pit was identified in plan view as a small, ovate, organic stain. The feature was completely excavated in one unit (FEAT 206), but two stratigraphic levels were utilized (see Figure 229).

Feature Fill

The pit contained two strata. The upper stratum corresponded to a slightly hard brown sandy silt that contained fine charcoal flecking and dispersed ash. The lower stratum contained a higher abundance of ash and charcoal as well as some oxidized sediments in the upper part of the level (see Figure 229). It was much softer and contained a high degree of rodent disturbance. One piece of flaked stone debitage was recovered from the upper level, and one unburned mammalian phalanx (indeterminate species) was found in the lower level. Pollen and charcoal samples (macrobotanical) recovered from the upper stratum were submitted for analyses (see Chapters 6 and 7, Volume 2).

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 206 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

Radiocarbon Analysis

None.

Abandonment Processes

The mottled sediment, oxidation, charcoal, and ash in the lower feature fill suggest that part of the pit was filled intentionally with refuse, perhaps from a thermal feature. The upper feature fill appeared to have been the result of natural alluvial deposition.

Stratigraphic Relationships and Associated Features

Two features were spatially associated with and in the same stratigraphic position as Feature 206 (at the Unit III1 surface, overlain by Unit V): nonthermal-pit Feature 68 and structure Feature 13. Based on geochronologic dating, these features date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520). Feature 206 was intrusive to Feature 68, and both were intrusive to the structure, Feature 13 (see Figure 226). The structure was radiocarbon dated to the Snaketown phase (cal. A.D. 650–780). This shortened the geochronologic age range for Feature 206 from 920 cal. B.C.–cal. A.D. 1520 to cal. A.D. 780–1520 (Pioneer to Protohistoric period).

Snaketown Phase Component

A single excavated nonthermal pit (Feature 97) at Site 68 was assigned to the Snaketown phase of the Pioneer period.

Feature 97

Feature type: nonthermal pit
Age: Snaketown phase
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: conical
Length (m): 0.56
Width (m): 0.52
Excavated depth (m): 0.46
Volume (m^3): 0.28

Excavation Methods

Feature 97 is a nonthermal pit that was identified in the central portion of MSU 60 (see Figure 221). It first appeared in plan view as a small, circular, organic stain. The feature was partially excavated in one section (SEC 269), which represents the approximate southern half of the pit. The section was over-excavated in one 1/4-inch-screened, arbitrary level, in order to fully expose the feature in profile (see Figure 228).

Feature Fill

The pit contains a single stratum that consists of a yellowish-brown sandy loam. Sparse amounts of charcoal, ash, oxidized sediments, and FAR were noted throughout the fill, but other artifacts were not encountered. Charcoal recovered from the pit fill was submitted for species identification (see Chapter 6, Volume 2). A moderate amount of insect and root disturbance was recorded throughout.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 97 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

Radiocarbon Analysis

A fragment of mesquite (*Prosopis* sp.) charcoal recovered from the floor fill (Level 3, TP 159) was submitted to Aeon Laboratories (Sample No. 1543) for AMS dating and returned a 2σ calibrated date range of cal. A.D. 670–780 (see Chapter 2, Volume 2). This date range places the use of the structure in the Snaketown phase (A.D. 650–750) of the Pioneer period.

Abandonment Processes

The presence of charcoal, ash, oxidized sediment, and FAR within the fill of Feature 97 suggests that the pit was filled intentionally with refuse from a thermal feature.

Stratigraphic Relationships and Associated Features

One feature is spatially associated with and in the same stratigraphic position as Feature 97 (at the Unit III1 surface, overlain by Unit V): nonthermal-pit Feature 11 (see Figure 221). Based on geochronologic dating, the feature dates to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520); it was not dated in any other manner. Feature 97 is not in direct contact with any features.

Nonthermal Bell-Shaped Pit

A single extramural nonthermal bell-shaped pit (Feature 142) was identified and excavated and is described below.

Middle to Late Archaic Period Component

A single excavated nonthermal bell-shaped pit was assigned to the Middle to Late Archaic period.

Feature 142

Feature type: nonthermal bell-shaped pit
Age: Middle to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: complete

Plan-view shape: circular
Cross-sectional shape: bell
Length (m): 1.37
Width (m): 1.10
Excavated depth (m): 1.20
Volume (m^3): 0.95

Excavation Methods

Feature 142 was an extramural bell-shaped pit identified during the excavation of MSU 60 (see Figure 221). The pit first appeared in plan view as a circular, organic stain. The stain was bisected (SECs 279 and 307), and each half was excavated in a single 1/4-inch-screened level (Figure 231).

Feature Fill

The fill of this nonthermal bell-shaped pit contained two strata (see Figure 231). The uppermost stratum was a dark-brown sandy silt with a blocky structure that existed only at the opening and neck of the pit. The lower stratum was a very soft clayey loam with occasional sand inclusions; it made up the bulk of the fill and also held three FAR fragments and pieces of oxidized sediment. Neither charcoal nor artifacts were present within either stratum.

Chronometric Data

Diagnostic Material Culture
None.

Geochronologic Analysis
Feature 142 was located within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C. (see Chapter 2, Volume 2), which corresponds to the Middle to Late Archaic period.

Radiocarbon Analysis
None.

Abandonment Processes

Feature 142 lacked burned materials and artifacts, with the exception of three pieces of FAR. The fill within the bell-shaped pit suggests that the pit was cleaned out prior to abandonment and filled with natural alluvial sediments. The lack of internal stratigraphy also suggests that the pit was filled quickly. Alternatively, the pit could have been cleaned out and filled intentionally.

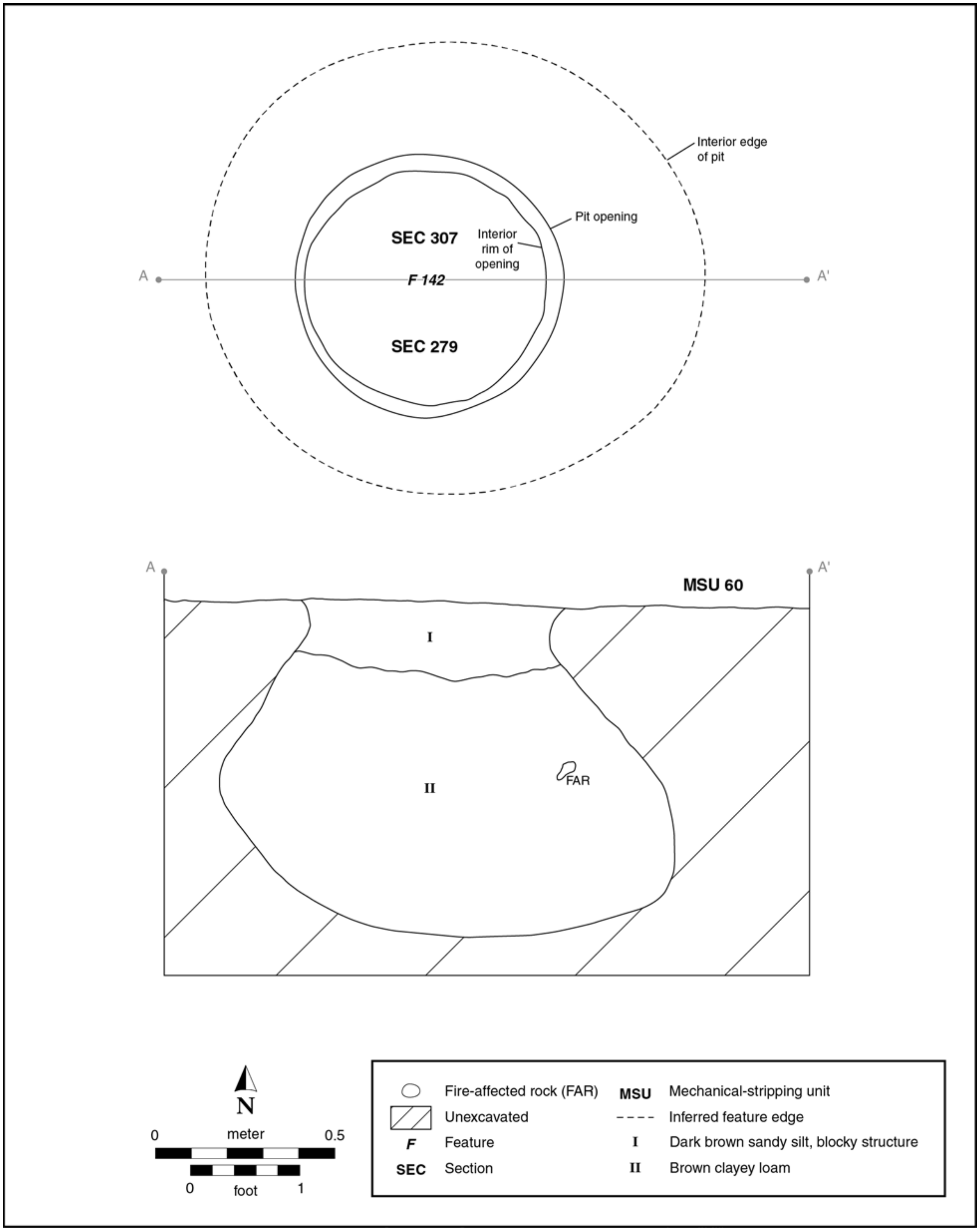


Figure 231. Plan view and profile of Feature 142.

Stratigraphic Relationships and Associated Features

Two features are spatially associated with and in the same stratigraphic position as Feature 142 (in Unit III1): nonthermal-pit Feature 146 and human-burial Feature 106 (see Figure 221). Based on geochronologic dating, these features date to the Middle to Late Archaic period (1380–920 cal. B.C.); they were not dated in any other manner. Feature 142 was not in direct contact with any features.

Artifact Concentration

A single extramural artifact cache (Feature 82) was identified and excavated and is described below.

Late Archaic to Protohistoric Period Component

Feature 82

Feature type: artifact concentration
Age: Late Archaic to Protohistoric period
Locus: Area B
Grid location: not applicable
Level of effort: complete
Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 0.18
Width (m): 0.13
Excavated depth (m): 0.09
Volume (m^3): not applicable

Excavation Methods

Feature 82 was an extramural artifact concentration identified during the excavation of MSU 60 (see Figure 221). It consisted of 10 unmodified rocks, 1 cobble-mano fragment, 5 indeterminate ground stone fragments, and 1 piece of flaked stone debitage in a 0.18-by-0.13-m area (Figure 232). A pit was not identified, and the feature was interpreted as a cluster of artifacts left on an extramural archaeological surface.

This feature was excavated as a whole by first mapping and then collecting all of the artifacts. An arbitrary 0.58-by-0.50-m unit was excavated over the area that held the artifacts, to confirm that no other artifacts were present (see Figure 232). This unit was excavated in a single 0.13-m-deep level, and the sediment was screened through 1/4-inch hardware cloth.

Feature Fill

The artifact concentration rested at the interface of Unit III1 and Unit V. Fill was not present, but the sediment surrounding the artifacts was a loosely compacted brown silty loam.

Chronometric Data

__Diagnostic Material Culture__
None.

__Geochronologic Analysis__
Feature 82 was located at the surface of Unit III1. Late Holocene alluvial-fan deposits (Unit V) overlay the structure. The unconformity between the Unit III1 surface and the Unit V stratum provides a geochronologic date of 920 cal. B.C.–cal. A.D. 1520 (see Chapter 2, Volume 2), which corresponds to the Late Archaic to Protohistoric period.

__Radiocarbon Analysis__
None.

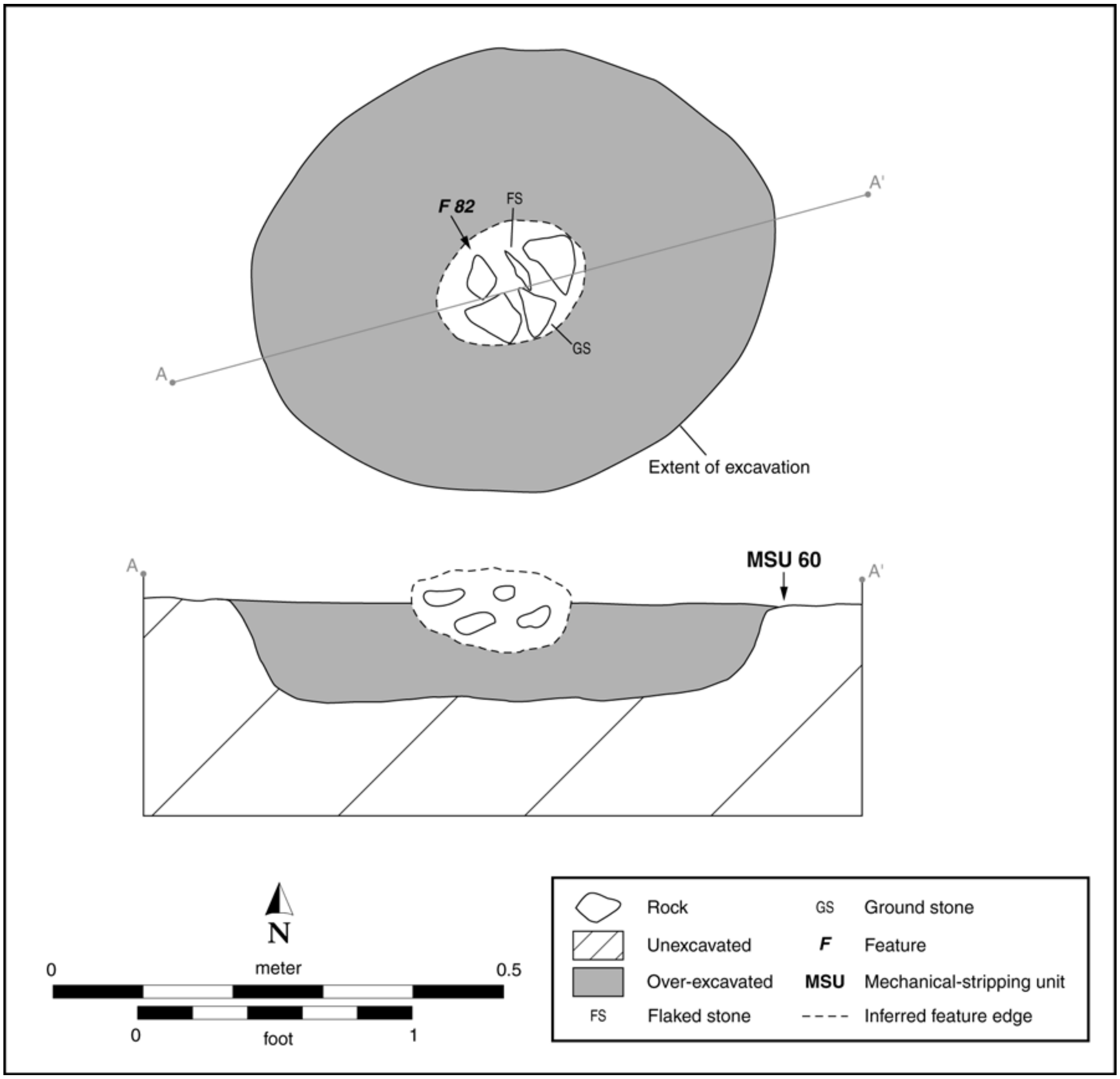


Figure 232. Plan view and profile of Feature 82.

Abandonment Processes

Feature 82 represents a cluster of artifacts left on an extramural activity surface. The artifacts were eventually covered with natural sediments.

Stratigraphic Relationships and Associated Features

Two features are spatially associated with and in the same stratigraphic position as Feature 82 (at the Unit III1 surface, overlain by Unit V): nonthermal-pit Features 79 and 95 (see Figure 221). Based on geochronologic dating, both of these features date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal. A.D. 1520); they were not dated in any other manner. Feature 82 was not in direct contact with any features.

Human Burial

Middle to Late Archaic Period Component

A single human burial was present at Site 68 and was assigned to the Middle to Late Archaic period.

Feature 106

Burial type: secondary cremation
Age designation: adult
Length (m): 6.53
Width (m): 3.35
Burial-pit depth (m): 0.45
Burial-pit orientation: indeterminate
Burial orientation: indeterminate
Age: 18+ years
Sex: indeterminate

Excavation Methods

Feature 106 consisted of fragmented and thermally altered human bone encountered during the mechanical stripping of MSU 60 (see Figure 221). Mechanical excavations were immediately halted, LAFB was contacted, and the location of the human remains was obscured. Manual excavation began only after consultation between LAFB and the involved Native American tribes was completed, and manual excavation was used to define the extent of the bone as well as to determine whether the bone was associated with an earthen-pit feature. Trowel excavation covered an area of approximately 3 by 4 m and revealed 36 individual bones or bone clusters. These were individually provenienced, mapped, and collected. Following the collection of all provenienced bone, a hand-stripping unit (HSU 137) was initiated over the location of the bone discovery (Figure 233). The unit measured 5.5 m north–south and 4.5 m east–west, encompassing the area in which bone was discovered, plus a 1-m buffer. The unit was excavated in an effort to find any burial-feature boundary and to recover any additional human remains. The first level of the unit extended to a depth of approximately 10 cm. All fill was screened through 1/8-inch mesh, and all bone and associated artifacts were collected.

Level 2 of HSU 137 was initiated and dug vertically an additional 10 cm. Fewer human-bone fragments were encountered at that level, and they were mostly concentrated in areas of root disturbance. Heavily burned faunal remains were also encountered, but they did not appear to be directly associated with the human remains. A third level was initiated but produced almost no bone fragments. No additional remains were discovered beyond the first 5 cm of the third level; so, excavation of HSU 137 was halted. Among the three levels in HSU 137, a total volume of 6.19 m^3 of sediment was screened, to recover all remains and artifacts.

Because no burial-pit or feature boundary could be associated with the human remains, excavation was directed by the presence and location of human-bone fragments. Bone fragments continued past the northwestern corner of HSU 137, and that necessitated the initiation of an additional hand-stripping unit, HSU 197 (see Figure 233). Like HSU 137, this unit was excavated in an effort to recover all human remains and to further determine whether the human remains could be attributed to a discrete pit feature. HSU 197 measured 4.4 m north–south and 4.2 m east–west, and its first level was dug to a depth of 10 cm. Few remains were encountered. To correspond with HSU 137, a second level was initiated in HSU 197 and excavated an additional 10 cm in depth. No human remains were discovered in this level. Flaked stone debitage was encountered but was not directly associated with the human remains. Excavation of HSU 197 ceased with the completion of Level 2.

A third hand-stripping unit (HSU 195) was initiated directly east of HSU 137 (see Figure 233), following the presence of bone fragments. The unit measured 2.7 m north–south and 0.6 m east–west and was dug in one 10-cm level, to correspond to Level 1 of HSU 137. The unit produced two bone fragments that were later determined to be nonhuman. No other items were encountered; so, excavation of the unit concluded.

Burial Pit

No burial pit was identified. A relict drainage channel trending south-southwest to north-northeast through the area of remains may have contributed to the obliteration of a burial pit, if one ever existed. The excavation limits were determined by the presence of human remains, not by any prepared boundary.

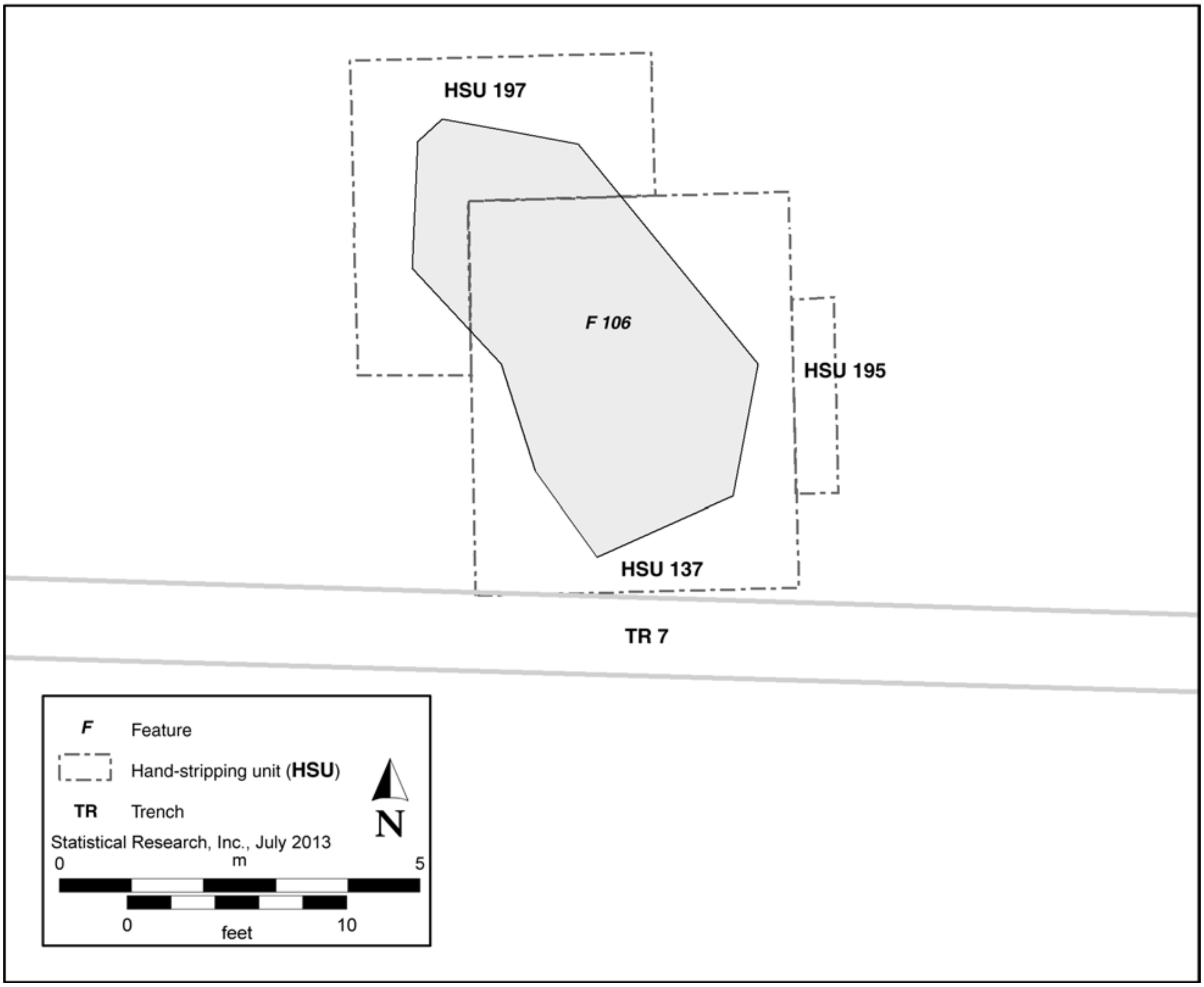


Figure 233. Plan view of Feature 106, showing the locations of HSUs 137, 195, and 197.

Burial Fill

The fill surrounding the remains included root disturbance and small pieces of oxidized soil, possibly from root burn. One piece of FAR was encountered in Level 3 of HSU 137.

In total, 231 artifacts were recovered during the excavation of Feature 106, including: 1 burned mano fragment, 1 uniface scraper, 2 biface tips, 221 fragments of flaked stone debitage, and 6 projectile point fragments. The projectile points included a heavily burned chert Elko Corner-notched point fragment and a side-notched San Pedro point made on obsidian and broken into four fragments. Because of bioturbation and disturbance from the relict drainage channel, it is unclear how many of these artifacts were related to the burial. Nevertheless, the presence of a relatively high number of projectile point fragments strongly suggests intentional placement with the human remains. The artifacts associated with this feature appear in Table 86.

Burial Treatment

The human remains exhibited varying degrees of thermal alteration, from superficial charring to complete calcination. The remains were highly fragmentary and were distributed across a 6.53-by-3.35-m area (see Figure 233). No burial pit was discovered, and no nearby thermal features contained any human remains. These attributes suggest that the burial represented a secondary cremation.

Few identifiable fragments were encountered. Elements that could be identified were not discovered in locations that could contribute to an understanding of body layout, orientation, or position.

Table 86. Feature 106 Artifacts

PD No.	Artifact Type	Count	Comments
138	projectile point fragment	1	Chert, burned; refits with item in PD 182.
138	scraper	1	Basalt, unifacial; 2 pieces refit, whole.
138	flaked stone debitage	18	Basalt, chert, and chalcedony; shatter and biface reduction.
138	projectile point fragment	1	Chert, Elko Corner-notched, heavily burned.
138	biface tip	1	Chert, burned; refits with item in PD 182.
138	projectile point fragment	1	Obsidian, San Pedro; broken into 4 pieces.
138	projectile point fragment	1	Chert, portion of base.
138	projectile point fragment	1	Chert, midsection, burned.
182	mano fragment	1	Granite, burned.
182	projectile point fragment	1	Chert, portion of base, burned, refits with item in PD 138.
182	flaked stone debitage	32	Quartz, chert, basalt, and rhyolite; shatter and biface reduction.
194	flaked stone debitage	54	Chert, chalcedony, and basalt; shatter and biface reduction.
198	flaked stone debitage	29	Chert, quartz, chalcedony, and basalt; shatter and biface reduction.
223	biface tip	1	Basalt, crude, unfinished.
223	flaked stone debitage	88	Basalt, quartzite, and chert; shatter, biface reduction, 1 core reduction.
Total		231	

Burial artifacts included 9 flaked stone tools, 221 flakes, and a mano fragment. Most of the artifacts displayed evidence of burning, suggesting that they had been associated with the remains during the primary cremation event. These are discussed in greater detail in Volume 2 of this series.

Stratigraphic Relationships and Associated Features

Feature 106 held no direct stratigraphic relationships; it neither intruded upon nor was intruded upon by any other feature. It originated within Unit III1, which represents isolated late Holocene alluvial-fan deposits. The bracketing age range for Unit III1 is 1380–920 cal. B.C., which corresponds to the Middle to Late Archaic period (see Chapter 2, Volume 2).

Three features (Features 79, 97, and 142) were nearby to Feature 106 (see Figure 221), but only one (Feature 142) shared a similar stratigraphic relationship. Feature 142 was a bell-shaped nonthermal pit 7.76 m to the north-northwest, in the Unit III1 horizon. Based on geochronologic dating, this feature also dated to the Middle to Late Archaic period (1380–920 cal. B.C.). It was not dated in any other manner. The absence of in situ burning, human remains, and burial-related artifacts within Feature 142 suggests that it was not directly associated with Feature 106. Features 79 and 97 are two nonthermal pits 10.56 m to the east-northeast and 7.64 m to the south-southeast of Feature 106, respectively. They originated above Feature 106, at the Unit III1 surface, and were overlain by Unit V. Based on geochronologic dating, these features date to the Late Archaic to Protohistoric period (920 cal. B.C.–cal A.D. 1520). Feature 97 was also radiocarbon dated and returned a narrower date range of cal. A.D. 670–780 (Snaketown phase).

CHAPTER 6

AZ T:7:423 (ASM)

Amelia M. Natoli, Heather J. Miljour, and Jason D. Windingstad

Site 423 consists of a small cluster of features and artifacts (Figure 234) and likely represents a seasonal encampment and resource-processing locale dating to the Early Archaic period to the Classic period. Feature types and artifacts seem to be similar to those of nearby Falcon Landing (see Chapter 4), and Site 423 is likely a component of that much larger site. Site 423 encompasses an area of 0.96 acres (3,865 m^2) and is located 52 m west of Falcon Landing and 76 m north of Site 68 (see Figure 1).

Site 423 is located on a broad, silty alluvial expanse that, today, is dominated largely by moderately dense saltbush (*Atriplex* spp.), wolfberry (*Lycium* spp.), and creosote bush (*Larrea tridentata*). A small drainage lined with mesquite (*Prosopis* sp.) and palo verde (*Parkinsonia microphylla*) trees trends through the western portion of the site and is causing heavy erosion (Figure 235). Average site elevation is 325 m (1,066 feet) AMSL, and the most predominant geologic marker near the site is a salt dome (Sunset Point) approximately 1.7 km (1 mile) to the east. The nearest mountain range is the White Tank Mountains, 9.7 km (6 miles) to the west, and the Agua Fria River is 7 km (4.3 miles) to the east (see Figure 2).

The entirety of our work at the site resulted in the point-location of 81 artifacts and the investigation of four features: two nonthermal pits, one nonthermal bell-shaped pit, and one FAR concentration (Table 87).

Previous Archaeological Investigations

Site 423 was originally recorded as Luke 03A-06 in 2003 by SRI, during a cultural resource survey of 275 acres adjacent to the munitions storage area (Tagg et al. 2007). The site was described as an artifact scatter within a 2,253-m^2 area. Twenty-five artifacts were recorded on the very sheetwashed and eroded site surface. No features were identified. Based on the presence of a cluster of Gila Plain sherds, the site was thought to be a Hohokam limited-activity area in use during the Ceramic period (A.D. 700–1400). Flaked stone and fragmented ground stone suggested a resource-procurement locale.

Summary of Phase 1 Investigations

Between November 3 and December 2, 2010, SRI conducted Phase 1 archaeological investigations at Site 423 (Hall et al. 2010; Hall et al. 2011). Each surface artifact was marked with a pin flag, assigned a unique provenience number, mapped with a total station, and collected (see Figure 234). In total, 113 artifacts were individually point-located on the modern ground surface (PDs 3–75, 114, and 115). The artifacts include 56 pieces of flaked stone debitage, 1 indeterminate ground stone fragment, 1 ceramic sherd, 3 mano fragments, 1 complete mano, 4 metate fragments, 9 pieces of FAR, and a pot drop consisting of 38 ceramic sherds (PD 14) (Table 88).

Following the collection of surface artifacts, Phase 1 trenching was carried out at Site 423. Testing efforts included the excavation of six east-west-oriented trenches placed at 15-m intervals (see Figure 234). In total, 200 m of trenches were excavated to an average depth of 1.2 m (4 feet) below modern ground surface. The trenches exposed a single pit, Feature 111 (Table 89). A hand-drawn profile was drafted (Figure 236), and photographs were taken. Two additional features in the trenches were later determined to be noncultural.

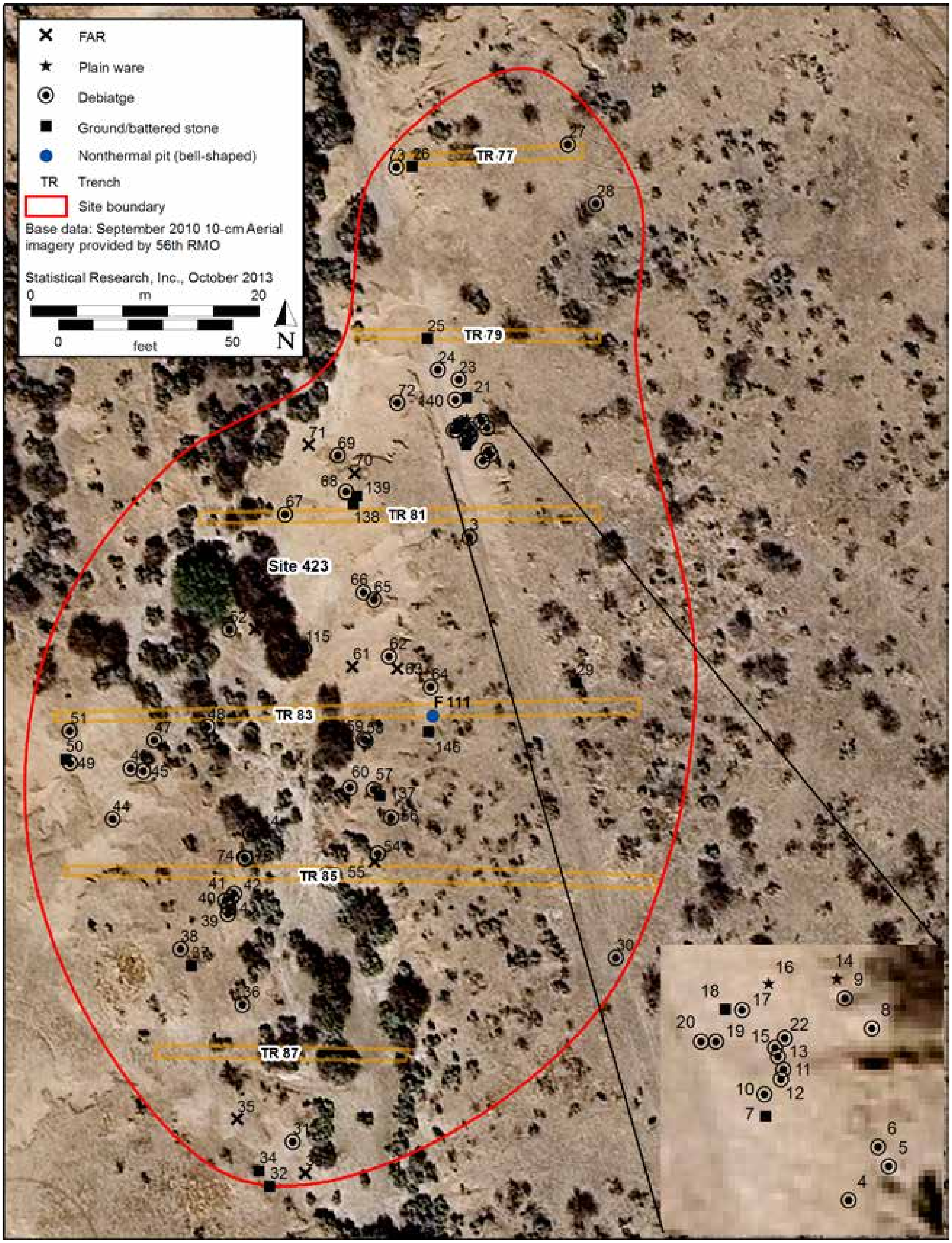


Figure 234. Site 423 map, Phase 1.

Figure 235. Overview photograph of Site 423.

Table 87. Site 423 Feature Inventory and Excavation Level of Effort

Feature Type	Fully Excavated	Partially Excavated	Examined	Sampled	Total
Nonthermal pits	—	2	—	—	2
Nonthermal pit (bell-shaped)	—	1	—	—	1
FAR concentration	—	1	—	—	1
Total	—	4	—	—	4

Table 88. Point-Located Surface Artifacts at Site 423

PD No.	Artifact Class	Artifact Type	Technological Type	Portion	Material	Count	Comments
3	flaked stone debitage	debitage	core flake	whole	rhyolite	1	
4	flaked stone debitage	debitage	tool use (percussion)	whole	basalt	1	
5	flaked stone debitage	debitage	core flake	whole	basalt	1	
6	flaked stone debitage	debitage	core flake	proximal	rhyolite	1	
7	ground/battered stone	ground stone	indeterminate	fragment	basalt	1	indeterminate shaping
8	flaked stone debitage	debitage	core flake	proximal	basalt	1	from ground stone manufacture?
9	flaked stone debitage	debitage	core flake	distal	basalt	1	from ground stone manufacture?
10	flaked stone debitage	debitage	indeterminate	whole	basalt	1	from ground stone production?
11	flaked stone debitage	debitage	core flake	whole	basalt	1	from ground stone manufacture?
12	flaked stone debitage	debitage	core flake	proximal	basalt	1	from ground stone manufacture?
13	flaked stone debitage	debitage	indeterminate	distal	basalt	1	
14	ceramic	plain ware	Gila Plain, Salt Variety	sherds	ceramic	38	represents one vessel
15	flaked stone debitage	debitage	core flake	whole	basalt	1	from ground stone manufacture?
16	ceramic	plain ware	Gila Plain, Salt Variety	sherd	ceramic	1	
17	flaked stone debitage	debitage	indeterminate	distal	rhyolite	1	
18	ground/battered stone	mano	cobble mano	fragment	basalt	1	indeterminate shaping; no fingerholds or trough-metate wear
19	flaked stone debitage	debitage	shatter	indeterminate	basalt	1	
20	flaked stone debitage	debitage	core flake	whole	basalt	1	from ground stone manufacture?
21	flaked stone debitage	debitage	shatter	indeterminate	basalt	1	
22	flaked stone debitage	debitage	core flake	proximal	basalt	1	from ground stone manufacture
23	flaked stone debitage	debitage	core flake	whole	rhyolite	1	
24	flaked stone debitage	debitage	indeterminate	midsection	rhyolite	1	
25	ground/battered stone	mano	cobble mano	fragment	schist	1	indeterminate shaping; no fingerholds or trough-metate wear
26	ground/battered stone	metate	indeterminate	fragment	basalt	1	pecking and grinding
27	flaked stone debitage	debitage	shatter	indeterminate	basalt	1	
28	flaked stone debitage	debitage	core flake	whole	basalt	1	
29	ground/battered stone	metate	indeterminate	fragment	granite	1	indeterminate shaping
30	flaked stone debitage	debitage	core flake	whole	rhyolite	1	
31	flaked stone debitage	debitage	core flake	whole	basalt	1	
32	ground/battered stone	metate	indeterminate	fragment	schist	1	indeterminate shaping
33	expedient use	FAR			andesite	2	
34	ground/battered stone	mano	cobble mano	whole	quartzite	1	pecking and grinding; no fingerholds or trough-metate wear
35	expedient use	FAR			basalt	1	
36	flaked stone debitage	debitage	core flake	distal	basalt	1	

PD No.	Artifact Class	Artifact Type	Technological Type	Portion	Material	Count	Comments
37	ground/battered stone	mano	cobble mano	fragment	andesite	1	indeterminate shaping; no fingerholds or trough-metate wear
38	flaked stone debitage	debitage	indeterminate	distal	quartz	1	
39	flaked stone debitage	debitage	indeterminate	proximal	rhyolite	1	
40	flaked stone debitage	debitage	core flake	proximal	quartz	1	
41	flaked stone debitage	debitage	indeterminate	distal	rhyolite	1	
42	flaked stone debitage	debitage	core flake	proximal	basalt	1	
43	flaked stone debitage	debitage	biface flake	distal	quartz	1	
44	flaked stone debitage	debitage	shatter	indeterminate	basalt	1	
45	flaked stone debitage	debitage	core flake	proximal	rhyolite	1	
46	flaked stone debitage	debitage	biface flake	distal	rhyolite	1	
47	flaked stone debitage	debitage	indeterminate	distal	basalt	1	
48	flaked stone debitage	debitage	biface flake	proximal	rhyolite	1	
49	flaked stone debitage	debitage	core flake	distal	basalt	1	
50	ground/battered stone	metate	flat metate	fragment	basalt	1	grinding only
51	flaked stone debitage	debitage	core flake	whole	basalt	1	
52	flaked stone debitage	debitage	core flake	whole	basalt	1	
53	expedient use	FAR			rhyolite	1	
54	expedient use	FAR			diorite	1	
55	flaked stone debitage	debitage	shatter	indeterminate	quartz	1	
56	flaked stone debitage	debitage	core flake	whole	quartz	1	
57	flaked stone debitage	debitage	shatter	indeterminate	quartz	1	
58	flaked stone debitage	debitage	shatter	indeterminate	quartzite	1	
59	flaked stone debitage	debitage	shatter	indeterminate	quartz	1	
60	flaked stone debitage	debitage	biface flake	midsection	quartz	1	
61	expedient use	FAR			basalt	1	
62	flaked stone debitage	debitage	biface flake	whole	chalcedony	1	
63	expedient use	FAR			basalt	1	
64	flaked stone debitage	debitage	indeterminate	distal	basalt	1	
65	flaked stone debitage	debitage	indeterminate	whole	basalt	1	
66	flaked stone debitage	debitage	biface flake	whole	chert	1	
67	flaked stone debitage	debitage	biface flake	whole	basalt	1	
68	flaked stone debitage	debitage	shatter	indeterminate	quartz	1	
69	flaked stone debitage	debitage	indeterminate	distal	quartz	1	
70	expedient use	FAR			basalt (vesicular)	1	
71	expedient use	FAR			rhyolite	1	
72	flaked stone debitage	debitage	biface flake	midsection	basalt	1	
73	flaked stone debitage	debitage	core flake	whole	basalt	1	
74	flaked stone debitage	debitage	biface flake	midsection	chalcedony	1	
75	flaked stone debitage	debitage	indeterminate	distal	basalt	1	
114	flaked stone debitage	debitage	indeterminate	whole	basalt	1	
115	flaked stone debitage	debitage	core flake	distal	rhyolite	1	
Total						113	

Table 89. Summary of Features at Site 423

Feature No.	Feature Type	Age	Phase Identified	Location	Phase Investigated	Level of Effort
111	nonthermal pit (bell-shaped)	Early to Late Archaic period	Phase 1	Trench 83	Phase 2	partial
131	FAR concentration	Late Cienega to Red Mountain phase	Phase 2	MSU 129	Phase 2	partial
135	nonthermal pit	Late Archaic to Classic period	Phase 2	MSU 129	Phase 2	partial
136	nonthermal pit	Late Archaic to Classic period	Phase 2	MSU 129	Phase 2	partial

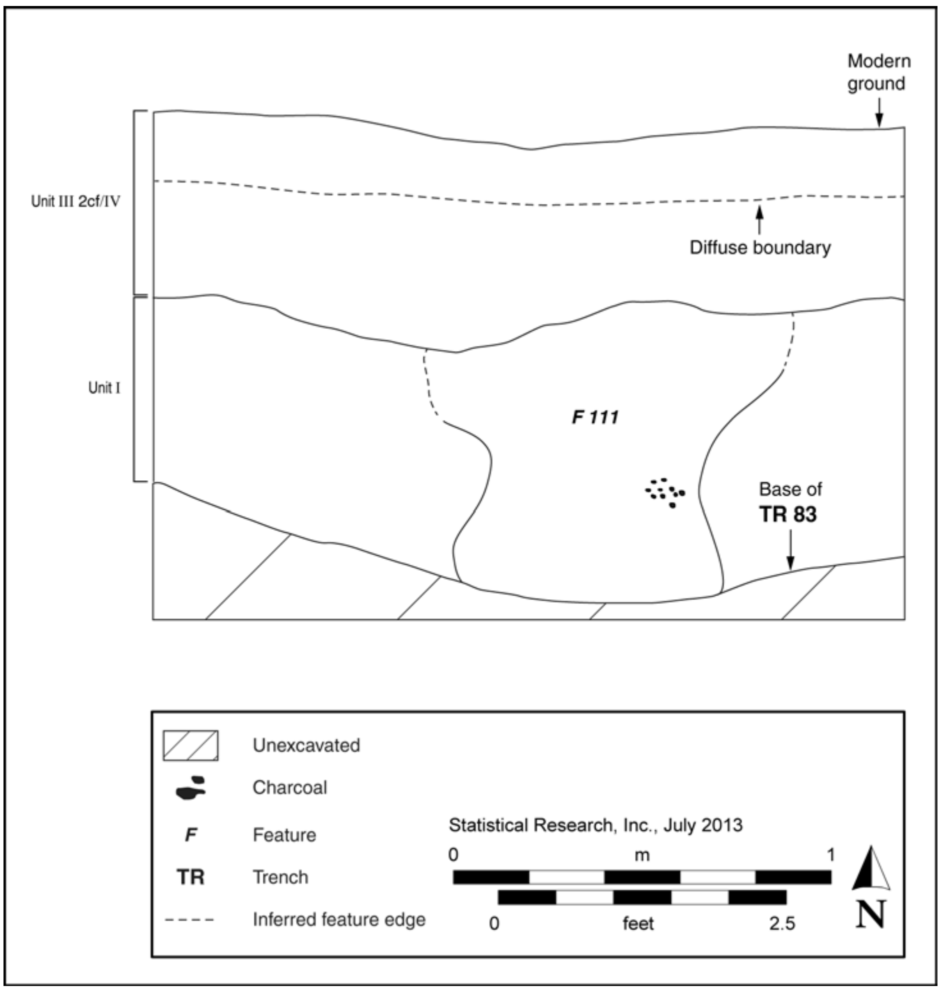


Figure 236. Profile of Feature 111, in the southern wall of TR 83.

Phase 2 Goals and Field Methods

Phase 2 data recovery took place at Site 423 between September 19, 2011, and February 9, 2012. This involved mechanical stripping over Feature 111 and around a possible feature found in a trench on the southwestern side of the site. The possible feature was determined to be noncultural, but three additional pits were exposed in plan view during mechanical stripping. The stripped area was expanded into a 1,510-m^2 (0.37-acre) area with two MSUs (MSUs 127 and 129) (Figure 237).

Phase 2 Results

In addition to Feature 111, mechanical stripping exposed two nonthermal pits and an FAR concentration (see Table 89), all of which were partially excavated during Phase 2. As a result of the excavation of all identified features, site closure was not carried out. Six ground stone artifacts were also point-located on the stripped surface (see Figure 237): four manos (PDs 137, 138, 139, and 140), a nether stone (also PD 138), and a flat/concave metate (PD 146) (Table 90).

Site 423 Stratigraphy

The stratigraphic sequence of Site 423 consisted of undifferentiated Unit III2cf/IV alluvial fan reach deposits over Unit I. A limited number of features were located either on the Unit I surface and buried by Unit III2cf/IV or within the III2cf/IV alluvium. A Unit V channel ran north–south along the western edge of the site (see Chapter 2, Volume 2).

Feature Descriptions

This section details the excavation methods and feature descriptions for the partially and fully excavated features. We identified four features at Site 423, all of which were considered to be extramural features. All of the identified extramural features were partially or completely excavated and are described below. The following feature descriptions are arranged by feature type, then chronological component. Features at Site 423 were assigned to three different chronological groups: the Early to Late Archaic period group, the Late Cienega to Red Mountain phase group, and the Late Archaic to Classic period group. The Late Cienega to Red Mountain phase feature (Feature 131) was radiocarbon dated and was thus assigned to a specific cultural phase. The other Site 423 features were assigned to chronological groups based on their stratigraphic positions; therefore, these chronological groups are much more broadly defined.

Extramural Features

The four excavated extramural features at Site 423 were three nonthermal pits and one FAR concentration. Definitions of feature types can be found in Chapter 3 of this report. Figure 237 shows the relative locations of the four features. Individual characteristics of the three excavated pit features are presented in Table 91.

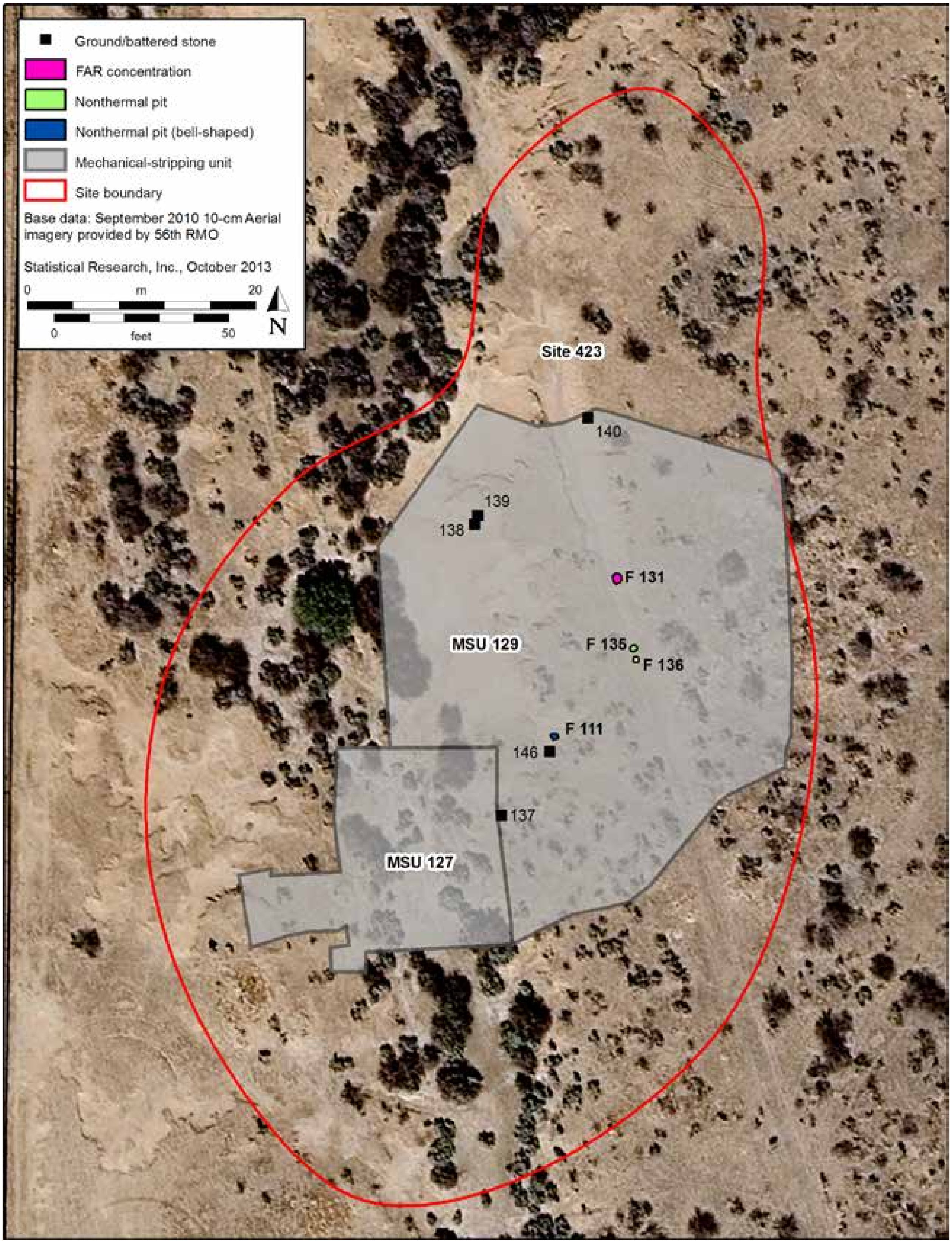


Figure 237. Site 423 map, Phase 2.

Table 90. Point-Located Artifacts in Mechanical-Stripping Units at Site 423

PD No.	Artifact Class	Artifact Type	Condition	Material	Count	Comments
137	ground stone	cobble mano	whole	granite	1	pecking and grinding; no fingerholds or trough-metate wear
138	ground stone	cobble mano	whole	quartzite	1	grinding only; no fingerholds or trough-metate wear
138	ground stone	nether stone	whole	rhyolite	1	grinding only
139	ground stone	cobble mano	whole	granite	1	grinding only; no fingerholds or trough-metate wear
140	ground stone	cobble mano	whole	basalt	1	pecking and grinding; no fingerholds or trough-metate wear
146	ground stone	flat/concave metate	whole	andesite	1	grinding only

Table 91. Characteristics of Excavated Extramural Features at Site 423

Feature No.	Feature Type	Level of Effort	Plan-View Shape	Cross-Sectional Shape	Dimensions (m)			Volume (m^3)	Feature-Fill Burn Density	Faunal Bone	Total Artifacts (n)	Artifact Density (n/m^3)
					Length	Width	Depth					
	Early to Late Archaic Component											
111	nonthermal pit (bell shaped)	partial	ind	bell	1	ind	0.96	ind	sparse	1	1	ind
	Late Archaic to Classic Component											
135	nonthermal pit	partial	circular	basin	0.65	0.60	0.24	0.046	moderate	—	—	—
136	nonthermal pit	partial	circular	basin	0.58	0.50	0.21	0.031	sparse	—	—	—
	Late Cienega to Red Mountain Component											
131	FAR concentration	partial	irregular	irregular	0.42	0.40	0.15	0.084	sparse	—	—	—

Key: ind = indeterminate.

Nonthermal Pits

Of the nonthermal pits (n = 3), two were circular in plan view, and one was indeterminate. Two of the pits had basin-shaped cross sections, and Feature 111 had a bell-shaped cross section. The average depth of these features was 0.47 m (see Table 91). Detailed descriptions of the three nonthermal pits are provided below.

Early to Late Archaic Period Component

A single nonthermal bell-shaped pit (Feature 111) was assigned to the Early to Late Archaic period component.

Feature 111

Feature type: nonthermal bell-shaped pit
Age: Early to Late Archaic period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: indeterminate
Cross-sectional shape: bell
Length (m): 1.00
Width (m): indeterminate
Excavated depth (m): 0.96
Volume (m^3): indeterminate

Excavation Methods

Feature 111 was a nonthermal bell-shaped pit discovered in TR 83 during Phase 1 (see Figures 234 and 236). During Phase 2, a backhoe was used to remove the overburden, exposing the pit in plan view. At that time, it became evident that approximately half the pit had been removed by the trench (Figure 238). The remaining portion of the feature was then excavated by hand in a single level (Section [SEC] 144), and all removed fill was sifted through 1/4-inch hardware cloth. A pollen sample and a flotation sample were collected.

Feature Fill

Pit contents consisted of an unstratified, moderately compact silty loam with sand, small gravel, and carbonate inclusions and a few charcoal flecks. An unburned snake vertebra was recovered from the flotation sample. Bioturbation from insects and rootlets was minimal.

Chronometric Data

Diagnostic material culture

None.

Geochronologic dating

Feature 111 was located at the surface of Unit I. Late Holocene alluvial-fan deposits (Unit III2cf/IV) overlay the feature. The unconformity between the Unit I surface and the Unit III2cf/IV stratum provided a geochronologic date of ca. 5320–160 cal. B.C. (see Chapter 2, Volume 2).

Radiocarbon dating

None.

Abandonment Processes

Feature 111 has one uniform stratum of fill that seems to have been deposited in a single episode. The lack of internal stratigraphy suggests that the feature may have been culturally refilled after its use.

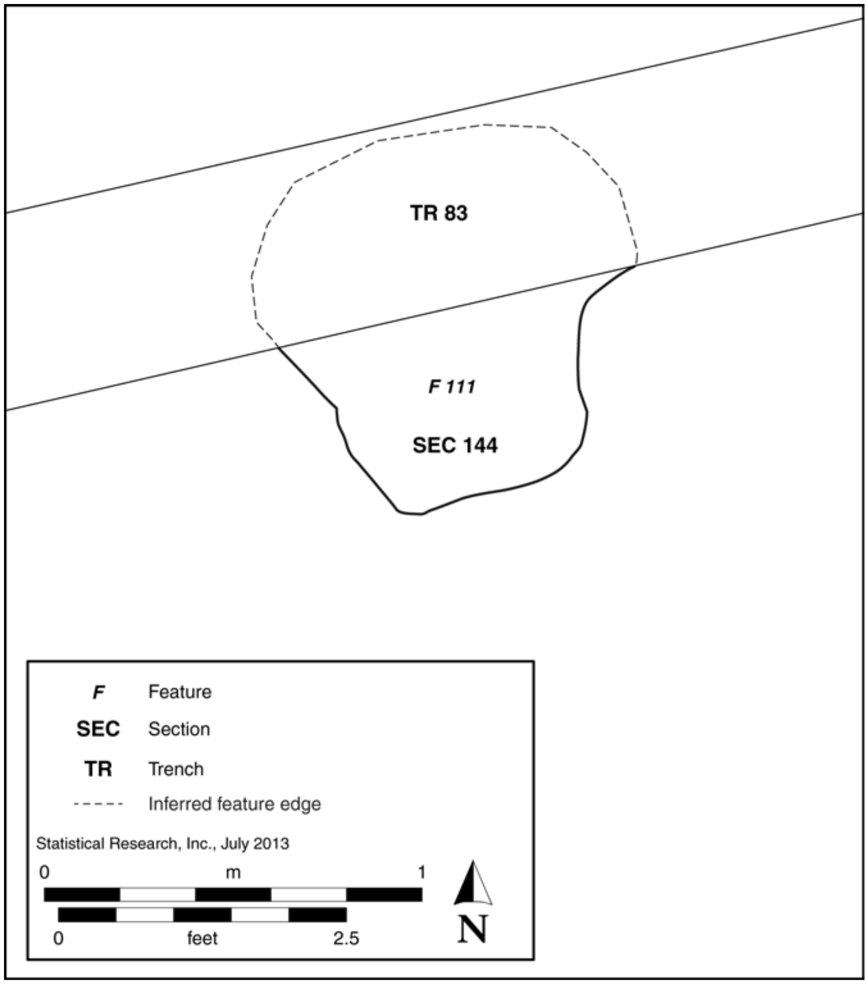


Figure 238. Plan view of Feature 111.

Stratigraphic Relationships and Associated Features

Feature 111 was present at the surface of Unit I, suggesting that it was occupied after the Early Archaic period. Two nonthermal pits, Features 135 and 136, were about 10 m to the northeast of Feature 111 (see Figure 237). Both of these features dated to the Late Archaic to Classic period.

Late Archaic to Classic Period Component

Two nonthermal pits at Site 423 were assigned to the Late Archaic to Classic period component.

Feature 135

Feature type: nonthermal pit
Age: Late Archaic to Classic period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.65
Width (m): 0.60
Excavated depth (m): 0.24
Volume (m^3): 0.20

Excavation Methods

Feature 135 was a nonthermal pit exposed during the mechanical stripping of MSU 129 (see Figure 237). An unknown upper portion of the pit was truncated by the backhoe. Hand-excavation removed the eastern half (SEC 150) (Figure 239), which was worked through 1/4-inch mesh. A pollen sample and a flotation sample were collected. At the completion of excavation, scaled plan and cross-section maps were drawn, and digital photographs were taken.

Feature Fill

The pit fill consisted of a single stratum of fine, ashy silt loam with minimal compaction. The only inclusions were 5 percent fine to medium sand and charcoal flecks. Four pieces of FAR were visible on the stripped surface (Figure 240) but were not collected.

Chronometric Data

Diagnostic material culture

None.

Geochronologic dating

Feature 135 was located within Unit III2cf/IV undifferentiated late Holocene alluvial-fan deposits. The relative age range of a feature with this stratum designation is 160 B.C.–A.D. 1220 (see Chapter 2, Volume 2).

Radiocarbon dating

None.

Abandonment Processes

The pit showed no evidence of in situ burning and may be a deposit of cooking refuse from a primary thermal feature, although no thermally altered pits that would be sources of burned materials were found on-site.

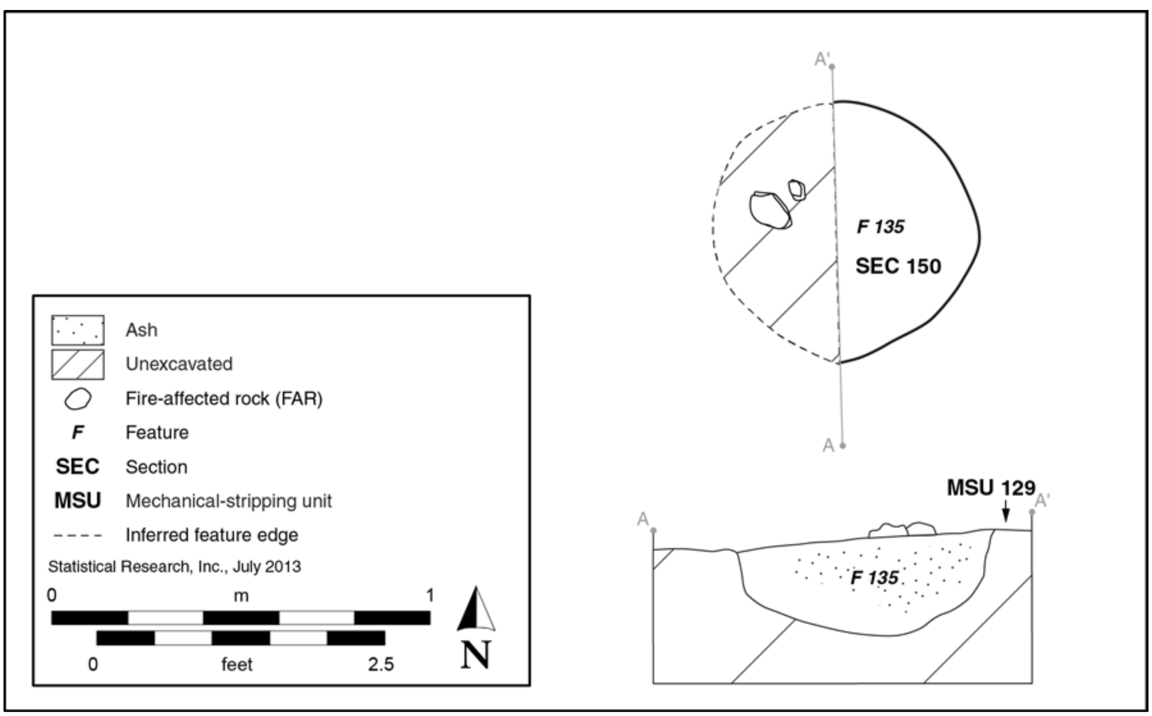


Figure 239. Plan view (*top*) and profile (*bottom*) of Feature 135.

Figure 240. Photograph of Feature 135, view to the north.

Feature 135 may represent a cleanout from such a feature and could be considered a secondary trash deposit. Alternatively, Feature 135 could represent the remains of an open-air fire or a deflated, shallow pit feature that had been filled by natural processes.

Stratigraphic Relationships and Associated Features

Another nonthermal pit, Feature 136, was located less than 1 m to the south of Feature 135, in the same stratigraphic unit (see Figure 237).

Feature 136

Feature type: nonthermal pit
Age: Late Archaic to Classic period
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.58
Width (m): 0.50
Excavated depth (m): 0.21
Volume (m^3): 0.13

Excavation Methods

Feature 136 was identified during the mechanical stripping of MSU 129 (see Figure 237) as a circular, ashy stain containing FAR. The southeastern portion of the pit was inadvertently removed by the backhoe, but the remainder of the southern half was hand-excavated (SEC 154) (Figure 241) and worked through $^1/_4$-inch hardware cloth. A pollen sample and a flotation sample were collected.

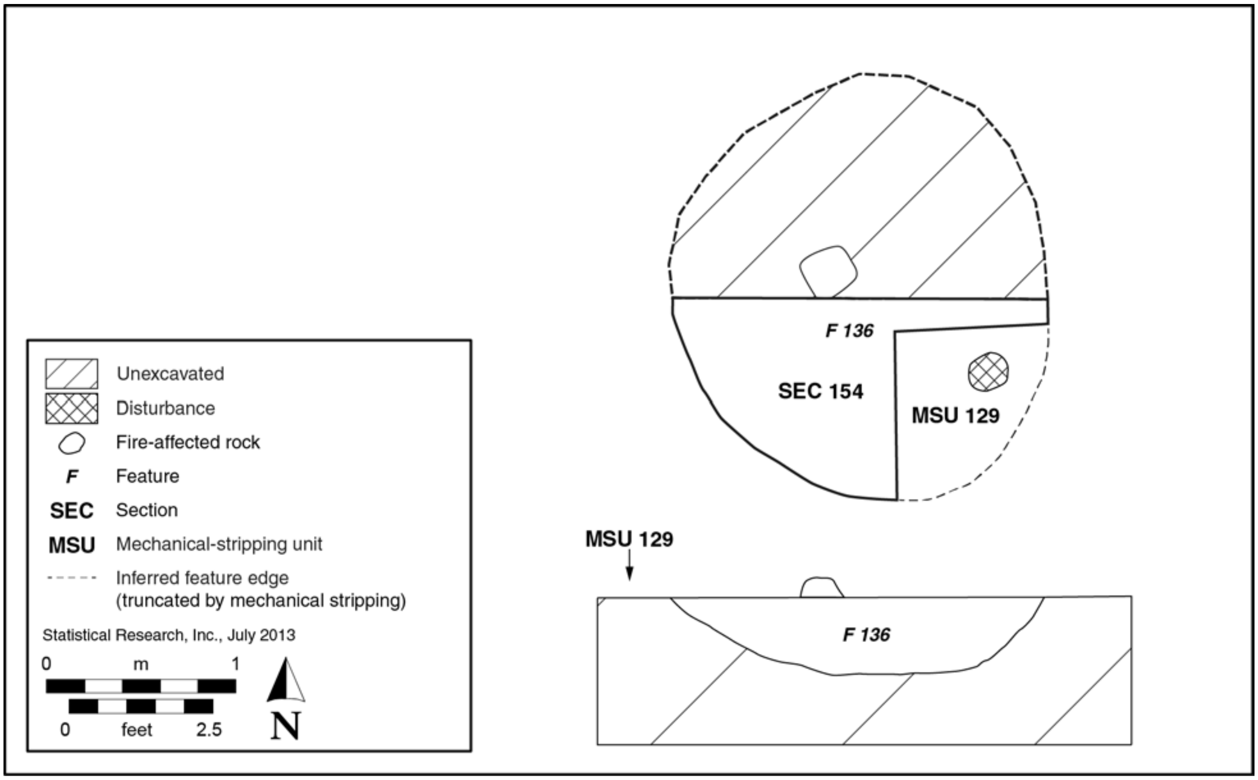


Figure 241. Plan view (*top*) and profile (*bottom*) of Feature 136.

Feature Fill

Feature 136 contained an unstratified brown silty loam with fine sands, carbonate filaments, and charcoal flecks. A few pieces of FAR and burned ground stone were noted but were not collected. No other cultural material was present.

Chronometric Data

Diagnostic material culture

None.

Geochronologic dating

Feature 136 was located within Unit III2cf/IV undifferentiated late Holocene alluvial-fan deposits. The relative age range of a feature with this stratum designation is 160 B.C.–A.D. 1220.

Radiocarbon dating

None.

Abandonment Processes

No evidence of in situ burning was observed in the pit. Feature 136 may represent a pit used for some unknown storage or processing activities that had been cleaned out and subsequently used as a secondary trash deposit.

Stratigraphic Relationships and Associated Features

Feature 135, another nonthermal pit, was located in the same stratigraphic unit as Feature 136, less than 1 m to the north (see Figure 237).

FAR Concentration

A single FAR concentration, Feature 131 (see Table 89), was identified and excavated at Site 423 (see Figure 237).

Late Cienega to Red Mountain Phase Component

Feature 131, the FAR concentration at Site 423, was assigned to the Late Cienega to Red Mountain phase component.

Feature 131

Feature type: FAR concentration
Age: Late Cienega to Red Mountain phase
Locus: Area B
Grid location: not applicable
Level of effort: partial

Plan-view shape: irregular
Cross-sectional shape: irregular
Length (m): 0.42
Width (m): 0.40
Excavated depth (m): 0.15
Volume (m^3): not applicable

Excavation Methods

Feature 131 was an FAR concentration identified during the excavation of MSU 129 (see Figure 237). An unknown portion of Feature 131 was removed by the backhoe during mechanical stripping. The feature was bisected, and the southern half (SEC 159) was over-excavated by hand, in one arbitrary level, to identify the feature in profile (Figure 242). A macrobotanical sample was collected from the feature for further analysis (see Chapter 6, Volume 2).

Feature Fill

The over-excavated profile of Feature 131 helped to determine that a pit was not present and that the feature was only a concentration of FAR (see Figure 242). The sediments surrounding the FAR consisted of

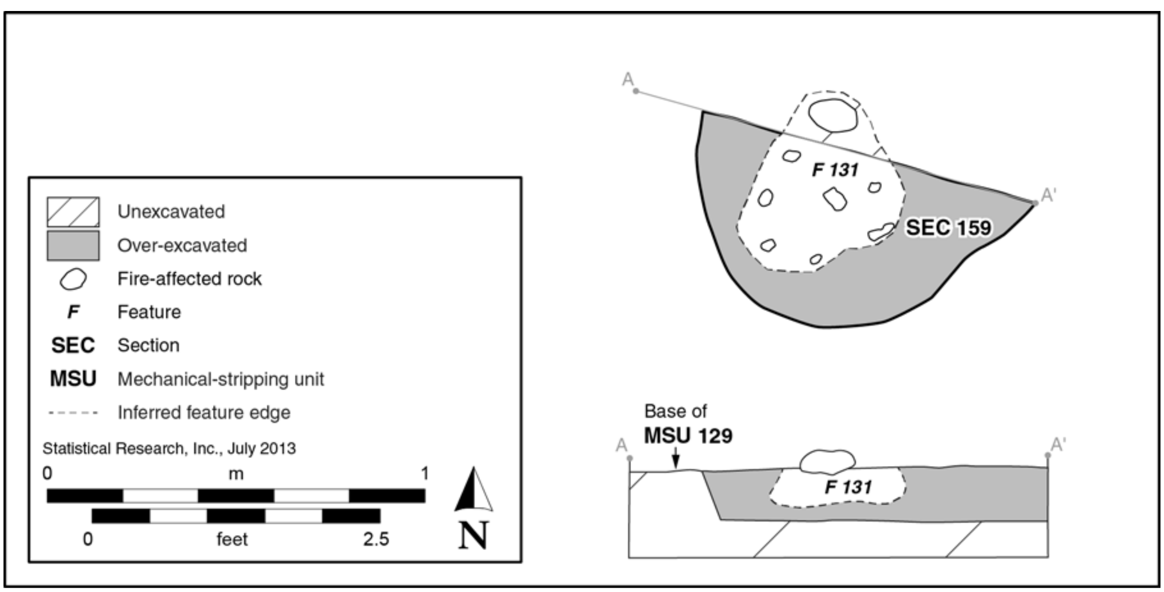


Figure 242. Plan view (*top*) and profile (*bottom*) of Feature 131.

a uniform, compact, brown silt with a small amount of fine sand and carbonate nodules. No charcoal was observed. Seven pieces of FAR were present in the section; most averaged 10 cm in diameter. The FAR was not collected.

Chronometric Data

Diagnostic material culture
None.

Geochronologic dating
Feature 131 was located on the surface of Unit I. Late Holocene fan deposits (Unit III2cf/IV) overlay the feature. The unconformity between the Unit I surface and Unit III2cf/IV provided a geochronologic date of ca. 5320 B.C.–A.D. 1220 (see Chapter 2, Volume 2).

Radiocarbon dating
A piece of mesquite (*Prosopis* sp.) charcoal was submitted to Aeon Laboratories (Sample No. 1547) for AMS dating and returned a 2σ calibrated date of A.D. 10–130. This date corresponds to the Late Cienega to Red Mountain phase.

Abandonment Processes
Feature 131 may represent a cleanout from a nearby thermal feature, the place where the FAR was discarded on the aboriginal surface. The sediments surrounding the FAR indicated that the feature had been later covered by naturally deposited alluvium.

Stratigraphic Relationships and Associated Features
Two nonthermal pits, Features 135 and 136, were located 5 m to the south of Feature 131 (see Figure 237). Both were in Unit III2cf/IV and dated to the Late Archaic to Classic period. They may be contemporaneous with Feature 131, or they may postdate it.

CHAPTER 7

AZ T:7:437 (ASM)

Amelia M. Natoli, Heather J. Miljour, and Jason D. Windingstad

Site 437 consists of a small cluster of Early Archaic to Classic period features and artifacts and likely represents a seasonal encampment and resource-processing locale (Figure 243). Feature types and artifacts seem to be similar to those of nearby Falcon Landing, and Site 437 is likely a component of that much-larger site (see Chapter 4). Site 437 encompasses an area of 2,663 m^2 (0.65 acres) (see Figure 1).

The site is located in the northeastern corner of the APE, next to a small, southeast-flowing drainage (see Figure 1). The wash is lined with wolfberry (*Lycium* sp.) and large mesquite (*Prosopis* sp.) and palo verde (*Parkinsonia microphylla*) trees. The average site elevation is 325 m (1,066 feet) AMSL, and the nearest mountain range is the White Tank Mountains, 10.5 km (6.5 miles) to the west. The Agua Fria River is located 6.4 km (4 miles) to the east (see Figure 2). The nearest archaeological site is Falcon Landing, which is 130 m to the west.

Site 437 was not identified during earlier investigations of the project area; it did not meet ASM criteria, because its surface manifestation was limited to a few artifacts. The site was preliminarily identified during the intersite-trenching phase of the current project, and its presence was confirmed during Phase 2 mechanical stripping. Site 437 is defined as separate from Falcon Landing, in part because of the drainage that forms a physical boundary between the two (see Figure 1).

The entirety of our work at the site resulted in the investigation of 18 features: 17 extramural pits and 1 FAR concentration (Tables 92 and 93).

Summary of Phase 1 Investigations

The intersite-trenching phase occurred between May 23 and June 9, 2011. A single pit feature (Feature 10307) was identified in one of the intersite trenches (TR 10069) and eventually became part of Site 437 during Phase 2 mechanical stripping (see Table 93; Figure 243). Once Feature 10307 was identified in the profile of TR 10069, a scaled profile map was drafted (Figure 244).

Phase 2 Goals and Field Methods

Phase 2 data recovery at Site 437 took place between December 6, 2011, and January 26, 2012. Mechanical stripping commenced with the goal of exposing Feature 10307 and other cultural materials in its vicinity. MSU 14 was established and expanded to a 40-by-50-m area. The depth of MSU 14 varied as features were identified, and if cultural materials were not found, the unit was terminated at approximately 0.5 m below the modern ground surface. MSU 14 encompassed 1,800 m^2 (0.45 acres). A drainage located immediately to the west of the site formed a natural boundary on one side of the MSU, as did a large mesquite tree in the southeastern corner (see Figure 243).

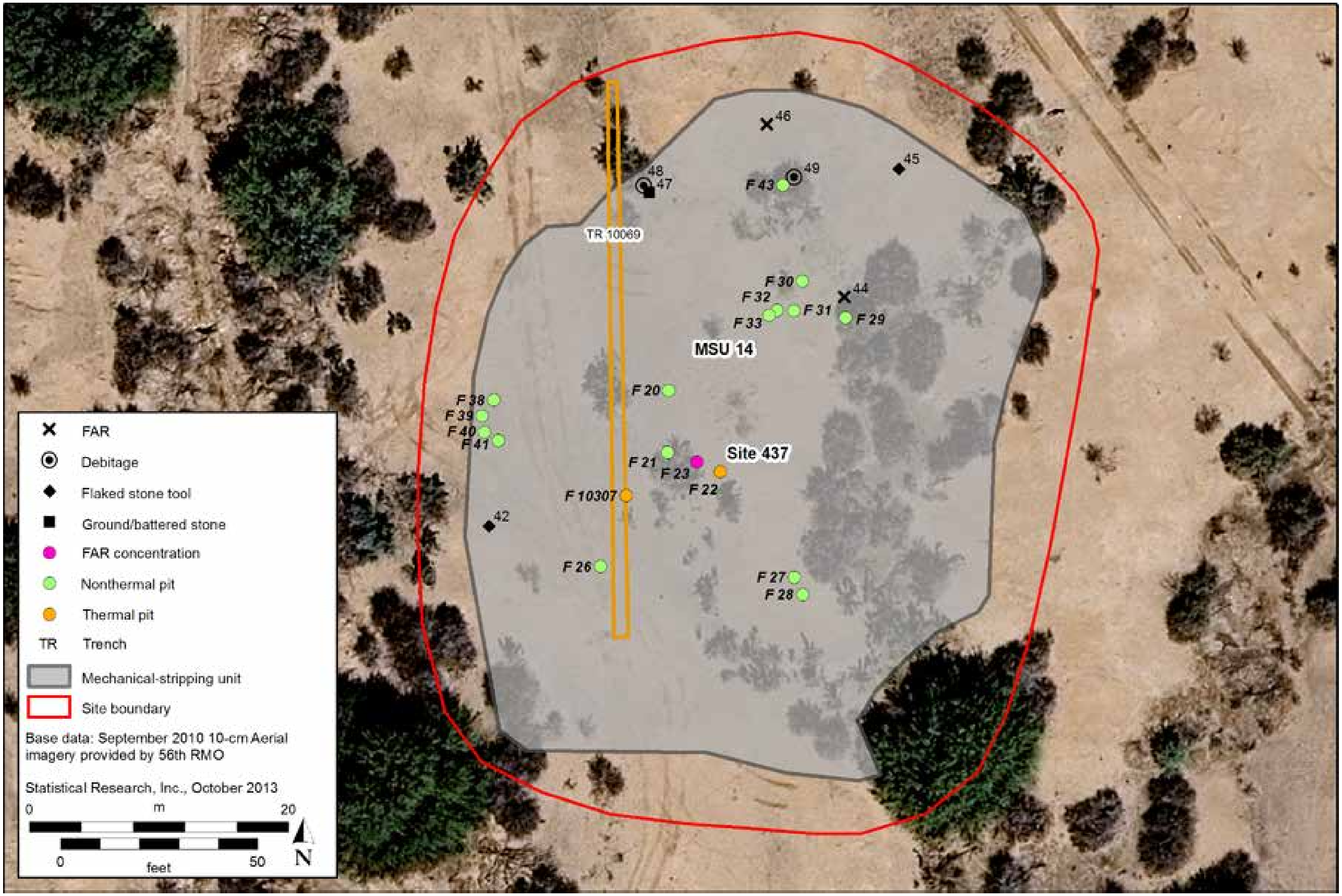


Figure 243. Site 437 map, Phases 1 and 2.

Table 92. Site 437 Feature Inventory and Excavation Level of Effort

Feature Type	Fully Excavated	Partially Excavated	Examined	Sampled	Total
Nonthermal pits	—	11	4	—	15
Thermal pits	1	—	1	—	2
FAR concentration	—	—	1	—	1
Total	1	11	6	—	18

Table 93. Site 437 Feature Summary

Feature No.	Feature Type	Age	Phase Identified	Location	Phase Investigated	Level of Effort
20	nonthermal pit	Chiricahua phase	Phase 2	MSU 14	Phase 2	examined
21	nonthermal pit	Late Archaic to Pioneer period	Phase 2	MSU 14	Phase 2	examined
22	thermal pit	Middle to Late Archaic period	Phase 2	MSU 14	Phase 2	examined
23	FAR concentration	Chiricahua phase	Phase 2	MSU 14	Phase 2	examined
26	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 14	Phase 2	partial
27	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 14	Phase 2	examined
28	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 14	Phase 2	examined
29	nonthermal pit	Late Archaic to Pioneer period	Phase 2	MSU 14	Phase 2	partial
30	nonthermal pit	Pioneer to Classic period	Phase 2	MSU 14	Phase 2	partial
31	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 14	Phase 2	partial
32	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 14	Phase 2	partial
33	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 14	Phase 2	partial
38	nonthermal pit	Middle to Late Archaic period	Phase 2	MSU 14	Phase 2	partial
39	nonthermal pit	Late Archaic to Pioneer period	Phase 2	MSU 14	Phase 2	partial
40	nonthermal pit	Late Archaic to Pioneer period	Phase 2	MSU 14	Phase 2	partial
41	nonthermal pit	Cienega phase	Phase 2	MSU 14	Phase 2	partial
43	nonthermal pit	Late Archaic to Pioneer period	Phase 2	MSU 14	Phase 2	partial
10307	thermal pit	Sulphur Spring phase	Phase 1	TR 10069	Phase 2	complete

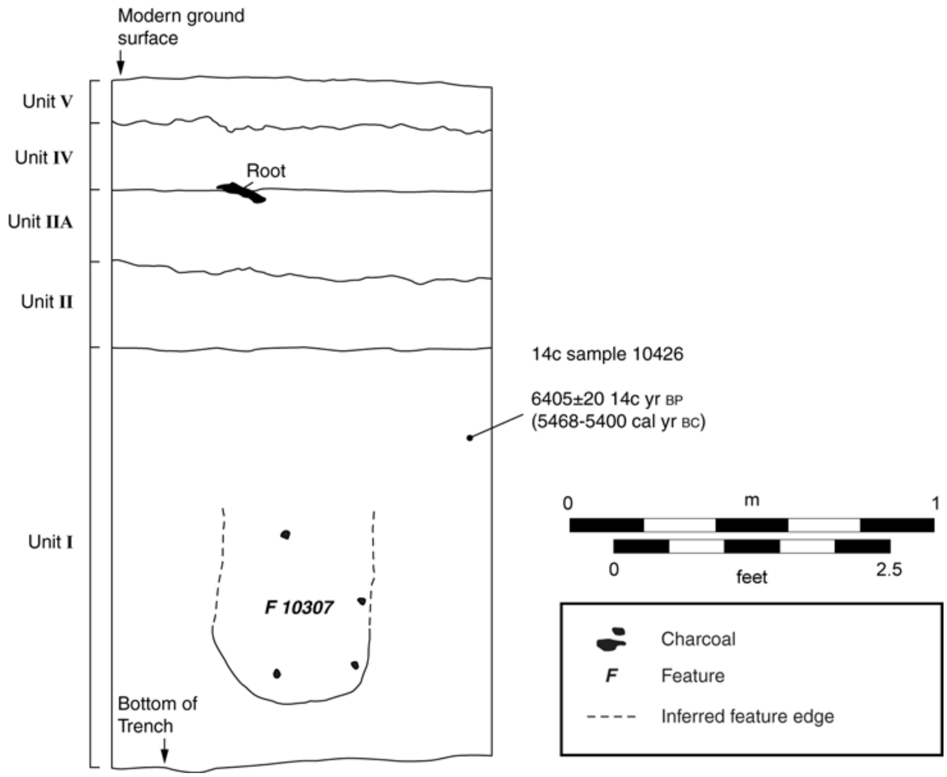


Figure 244. Profile of Feature 10307, in the eastern wall of Trench 10069.

As a general rule, if a pit contained artifacts or charred plant materials or had oxidized walls, it was fully excavated. If a pit lacked significant quantities of artifacts, charred plant remains, and oxidized walls, the pit was only sectioned. Further details regarding extramural-feature-excavation procedures and findings can be found in the Extramural Features section of this chapter (below), and characteristics of the excavated features are listed in Table 94.

Phase 2 Results

During the excavation of MSU 14, 16 extramural pits, 1 FAR concentration, and 11 artifacts were identified on the MSU surface. The artifacts are 2 basalt unidirectional cores (PDs 42 and 45), 5 pieces of flaked stone debitage (PDs 48 and 49), 3 pieces of FAR (PDs 44 and 46), and 1 cobble-mano fragment (PD 47). Each of these artifacts was mapped with a total station (see Figure 243) and collected for further analysis (Table 95). The flake stone debitage consisted of core flakes and shatter.

The 18 total features at Site 437 are 17 pits and 1 FAR concentration. The pits have been subdivided into subtypes: nonthermal (n = 15) and thermal (n = 2) pits, definitions of which can be found in Chapter 3. Figure 243 shows the relative locations of the different features, and individual characteristics of all excavated pits are summarized in Table 94. Of the 18 total features, 11 were partially excavated, 1 was completely excavated, and 6 were examined (see Table 92). We partially or completely excavated 67 percent of the features identified at Site 437. The 11 partially excavated features are all nonthermal pits; 1 thermal pit was completely excavated.

Table 94. Characteristics of Excavated Extramural Pits at Site 437

Feature No.	Feature Type	Level of Effort	Plan-View Shape	Cross-Sectional Shape	Feature-Fill Burn Density	Dimensions (m) Length	Width	Depth	Feature Volume (m^3)	Flaked Stone	Ground Stone	FAR	Faunal Bone	Total Artifacts (n)	Artifact Density (n/m^3)
Sulphur Spring Phase															
10307	thermal pit	complete	ind	basin	abundant	0.65	ind	0.34	0.026	—	—	—	5	5	192.308
Middle to Late Archaic Period															
26	nonthermal pit	partial	circular	basin	sparse	0.58	0.55	0.21	0.014	—	—	—	—	—	
31	nonthermal pit	partial	circular	basin	nonexistent	0.56	0.49	0.18	0.015	—	—	—	—	—	
32	nonthermal pit	partial	circular	basin	sparse	0.39	0.34	0.11	0.003	—	—	—	—	—	
33	nonthermal pit	partial	circular	basin	non-existent	0.68	0.66	0.17	0.016	2	—	—	—	2	125
38	nonthermal pit	partial	circular	basin	indeterminate	0.81	0.71	0.14	0.021	—	—	—	—	—	
Late Archaic to Pioneer Period															
29	nonthermal pit	partial	circular	basin	sparse	0.22	0.2	0.13	0.008	—	—	—	—	—	
39	nonthermal pit	partial	circular	basin	abundant	1.00	0.76	0.24	0.045	—	3	—	—	3	66.667
40	nonthermal pit	partial	circular	basin	moderate	1.02	0.88	0.33	0.088	1	1	—	—	2	22.727
43	nonthermal pit	partial	ind	cylindrical	sparse	ind	0.44	0.13	0.016	—	2	—	—	2	125
Cienega Phase															
41	nonthermal pit	partial	circular	basin	moderate	1.02	0.88	0.25	0.061	—	2	2	—	4	65.574
Pioneer to Classic Period															
30	nonthermal pit	partial	circular	basin	sparse	0.50	0.45	0.13	0.006	—	—	—	—	—	

Key: ind = indeterminate.

Table 95. Point-Located MSU Artifacts at Site 437

PD No.	Artifact Class	Artifact Type	Technological Type	Condition or Portion	Count	Material
42	flaked stone tool	cobble uniface	unidirectional core	complete	1	basalt
44	expedient use	fire-altered rock			1	andesite
45	flaked stone tool	cobble uniface	unidirectional core	complete[a]	1	basalt
46	expedient use	fire-altered rock			2	rhyolite
47	ground/battered stone	mano	cobble mano	fragment	1	schist
48	flaked stone debitage	debitage	core flake	complete	1	basalt
48	flaked stone debitage	debitage	shatter	indeterminate	2	basalt
49	flaked stone debitage	debitage	shatter	indeterminate	1	rhyolite
49	flaked stone debitage	debitage	shatter	indeterminate	1	rhyolite

[a] A few opposed removals were noted, likely for platform preparation.

Between April 10 and 24, 2013, SRI conducted site closure at Site 437. As stated in the HPTP (Hall et al. 2011:49), SRI was contracted to manually excavate a 50 percent sample of all cultural features per feature type, function, and temporal component within the APE. Once the feature sampling was complete, the remaining unexcavated features were examined to ensure that all burials and mortuary items were cleared from the APE prior to construction. The examination of a feature was carried out by manual removal of the fill and inspection of the feature for human remains or mortuary items. If no burial was present, then the type of feature (e.g., thermal pit or nonthermal pit) was determined and documented. In total, six features were examined at Site 437 during site closure (Table 96): four nonthermal pits, one thermal pit, and one FAR concentration. None of the examined features at Site 437 contained any human remains or funerary objects.

Site 437 Stratigraphy

The stratigraphic sequence of Site 437 included Units I, II, IIA, III2, IV, and V. A single feature was identified in Unit I. The remaining features were located on the surface of Units IIA and III2, and within Unit IV. Unit I at this location was deposited along an incised channel while Units II, IIA, III2, and V appear to have been alluvial fan reach sheet flood deposits. A Unit IV channel was documented along the southeast-east margin of the site (see Chapter 2, Volume 2).

Feature Descriptions

The following sections provide a physical description of each feature excavated at Site 437. In total, 18 features were identified at Site 437; all are considered to be extramural features. Twelve of the 18 identified extramural features were partially or completely excavated and are described below. The feature descriptions are arranged by feature type and then by chronological component. Features at Site 437 were assigned to five different chronological groups: the Sulphur Spring phase of the Early Archaic period, the Chiricahua phase of the Middle Archaic period, the Late Archaic period, the Late Archaic to Pioneer period, and the Pioneer to Classic period.

Table 96. Characteristics of Examined Pits at Site 437

Feature No.	Feature Type	Dimensions (m)		Depth (m)	Plan-View Shape	Cross-Sectional Shape	Charcoal?	Ash?	Cobbles?	FAR?	Oxidized Sediment?
		Length	Width								
Chiricahua phase											
20	nonthermal pit	0.54	0.48	indeterminate	circular	indeterminate	yes	no	no	no	no
23	FAR concentration	0.30	0.25	indeterminate	irregular	indeterminate	yes	no	no	no	yes
Middle to Late Archaic period											
22	thermal pit	0.40	0.38	indeterminate	circular	indeterminate	yes	no	no	yes	yes
27	nonthermal pit	0.39	0.37	indeterminate	circular	indeterminate	yes	no	no	no	yes
28	nonthermal pit	0.32	0.29	indeterminate	circular	indeterminate	yes	no	no	no	yes
Late Archaic to Pioneer period											
21	nonthermal pit	0.48	0.35	indeterminate	ovate	indeterminate	yes	no	no	no	yes

Extramural Features

The 12 excavated extramural features at Site 437 are 11 nonthermal pits and 1 thermal pit (see Chapter 3 for definitions of feature types). As previously noted, Figure 243 shows the relative locations of the different features, and the individual characteristics of all excavated pits are summarized in Table 94.

Thermal Pit

A single thermal pit (Feature 10307) was excavated and is described below.

Sulphur Spring Phase

The single excavated thermal pit at Site 437 was radiocarbon dated to the Early Archaic Sulphur Spring phase, and it is the earliest directly dated feature in the Luke Solar project.

Feature 10307

Feature type: thermal pit
Age: Sulphur Spring phase
Locus: Area A
Grid location: not applicable
Level of effort: complete

Plan-view shape: indeterminate
Cross-sectional shape: basin
Length (m): 0.65
Width (m): indeterminate
Excavated depth (m): 0.34
Volume (m^3): indeterminate

Excavation Methods

Feature 10307 was encountered in TR 10069 during testing. Approximately 40 percent of the pit was truncated by the trench (Figure 245). Backhoe stripping exposed a semicircular stain in plan view in MSU 14. Hand-excavation proceeded with the removal of the remaining portion of the pit (SEC 16) (see Figure 245). A pollen sample and a macrobotanical sample were collected and submitted for analysis (see Chapters 6 and 7, Volume 2).

Feature Fill

The upper portion of the fill was a reddish-brown sandy clay loam with charcoal flecking; it was generally similar to the surrounding matrix. The lower portion of the fill was extremely ashy and contained chunks of charcoal. Gravel and coarse sand typical of the sediments in the vicinity of the drainage were noted throughout the feature fill. Slight oxidation was visible in the base of the pit. Five unburned long-bone-shaft fragments from medium-sized mammals were recovered from the lower stratum.

Chronometric Data

<u>Diagnostic Material Culture</u>
None.

<u>Geochronologic Analysis</u>
The pit originated within Unit I, an early to middle Holocene alluvial-fan deposit. The bracketing age range for Unit I is 7040–5320 cal. B.C.

<u>Radiocarbon Analysis</u>
A piece of mesquite (*Prosopis* sp.) charcoal from Feature 10307 was submitted to Aeon Laboratories (Sample No. 1548) for AMS dating and returned a 2σ calibrated date range of 7040–6690 B.C. The date indicates that Feature 10307 is the earliest feature identified in the project area, corresponding to the Sulphur Spring phase of the Early Archaic period (see Chapter 2, Volume 2).

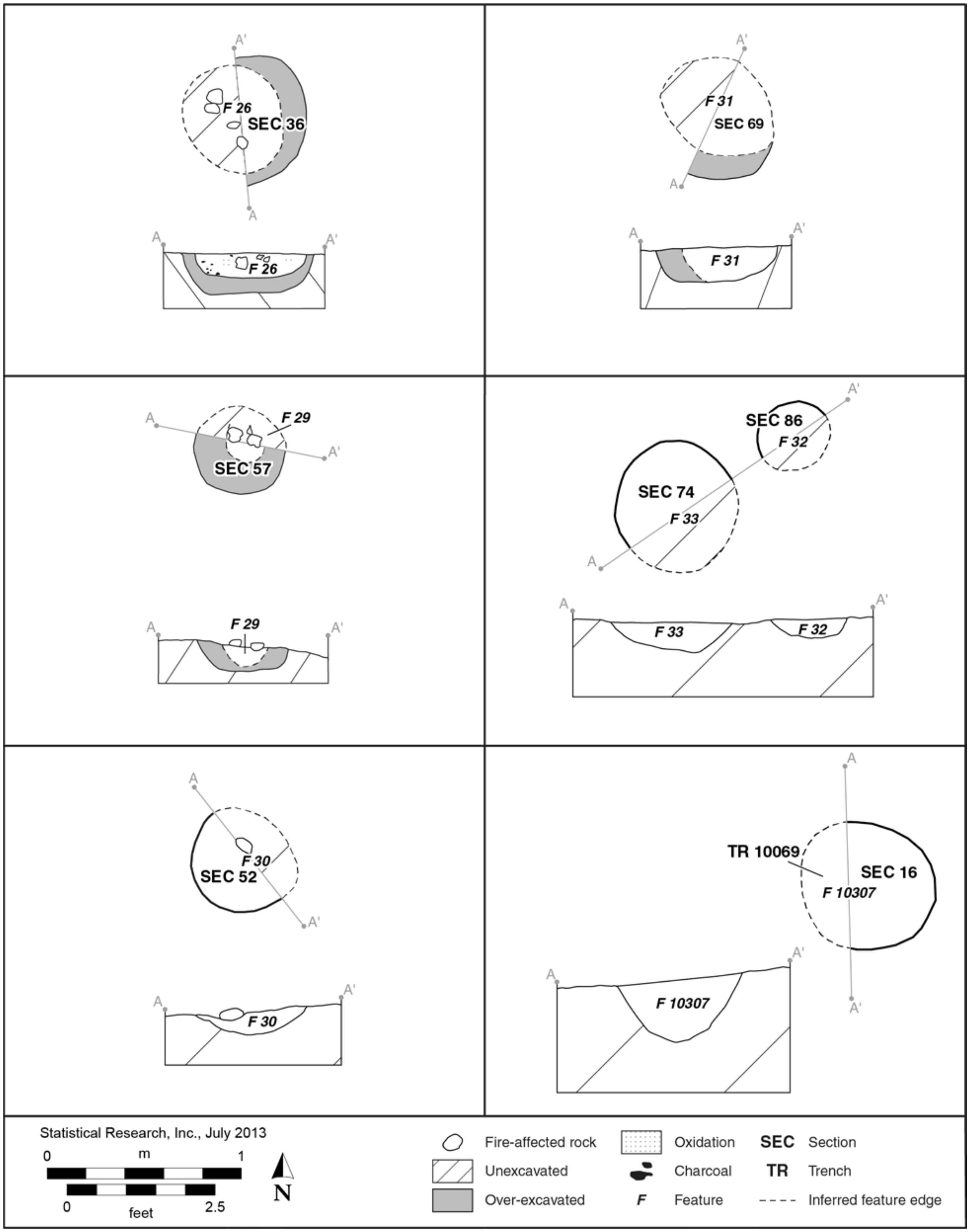


Figure 245. Plan views and profiles of Features 26, 29, 30, 31, 32, 33, and 10307.

Abandonment Processes

The feature was abandoned, and the remnants of its final use were left in place. The upper fill seemed to represent natural post-use deposits. The lower, charcoal-rich fill may be in situ deposits or cooking refuse.

Stratigraphic Relationships and Associated Features

No other pits in stratigraphic Unit I were found at the site (see Figure 243).

Nonthermal Pits

The partially excavated nonthermal pits (n = 11) were almost all circular in plan view and basin-shaped in cross section, with one exception: the plan view of one nonthermal pit (Feature 43) was indeterminate because of disturbances, and its cross section was interpreted as cylindrical. The pits averaged 0.19 m in depth (see Table 94). Cross sections of all of the examined pits were considered indeterminate (see Table 96).

Nine of the partially excavated nonthermal pits contained one or more of the following inclusions in their fill: charcoal, ash, FAR, and oxidized sediments. The presence of artifacts and ash-stained sediments in some of the pit features suggests postabandonment use as refuse repositories; other pits seemed to have been left open and filled in naturally. The following are detailed descriptions of the 11 partially excavated nonthermal pits.

Middle to Late Archaic

In total, five excavated nonthermal pits at Site 437 were assigned to the Chiricahua phase of the Middle Archaic period.

Feature 26

Feature type: nonthermal pit
Age: Chiricahua phase
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.58
Width (m): 0.55
Excavated depth (m): 0.21
Volume (m^3): 0.14

Excavation Methods

Mechanical stripping of MSU 14 exposed Feature 26 on the surface of stratigraphic Unit IIA. The backhoe removed an unknown portion of the upper part of the pit. It appeared as a circular, ashy patch of FAR and burned sediment. Hand-excavation proceeded with the removal of the southern half of the pit (SEC 36) in a single level (see Figure 245). Flotation and pollen samples were collected, and the remaining sediment was worked through 1/4-inch hardware cloth.

Feature Fill

The pit contained a single stratum of moderately compact dark-brown sandy silt with a few inclusions of FAR. Sparse charcoal and oxidized sediment were noted.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

The pit originated on the surface of Unit IIA; late Holocene alluvial-fan deposits (Unit III2) overlay the feature. The unconformity between the Unit IIA surface and Unit III2 provides a geochronologic date of ca. 2400–1190 cal. B.C. (see Chapter 2, Volume 2). This date range corresponds to the Chiricahua phase of the Middle Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

No evidence of in situ burning was observed in the pit. It may contain a deposit of cooking refuse or coals that were obtained from a thermal feature. Feature 26 may represent a cleanout from such a feature and could be considered a secondary trash deposit. Alternatively, Feature 26 could represent the remains of an open-air fire or a deflated, shallow pit feature that later filled with natural alluvial sediments.

Stratigraphic Relationships and Associated Features

The pit is not in direct contact with any other features (see Figure 243). No other pits in the same stratigraphic position are within 10 m of Feature 26.

Feature 31

Feature type: nonthermal pit
Age: Chiricahua phase
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.56
Width (m): 0.49
Excavated depth (m): 0.18
Volume (m^3): 0.10

Excavation Methods

Feature 31 was exposed on the surface of stratigraphic Unit IIA during mechanical stripping of the overburden in MSU 14. An unknown quantity of the upper pit fill was truncated by the backhoe. Hand-excavation of the pit proceeded with removal of the eastern half (SEC 69) in a single level (see Figure 245). Flotation and pollen samples were collected, and the remaining sediment was worked through 1/4-inch hardware cloth.

Feature Fill

The pit contained a single stratum of unstratified, moderately compact brown silty loam. No charcoal, ash, or other cultural materials were observed.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

The pit was located at the surface of Unit IIA; late Holocene alluvial-fan deposits (Unit III2) overlay the feature. The unconformity between the Unit IIA surface and Unit III2 provides a geochronologic date of ca. 2400–1190 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

The pit fill appeared to be a single uniform stratum. It may have been intentionally refilled with sediment, or it is possible that any stratigraphy from natural windblown and water-lain sediments was no longer apparent.

Stratigraphic Relationships and Associated Features

Feature 31 is not in direct contact with any other features. Nonthermal-pit Features 32 and 33 are located less than 1 m to the east, in the same stratigraphic horizon as Feature 31 (see Figure 243).

Feature 32

Feature type: nonthermal pit
Age: Chiricahua phase
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.39
Width (m): 0.34
Excavated depth (m): 0.11
Volume (m^3): 0.03

Excavation Methods

Feature 32 was exposed during mechanical stripping of the overburden in MSU 14. The backhoe removed an unknown portion of the upper part of the pit. Hand-excavation of the pit proceeded with removal of the northwestern half (SEC 86) in a single level (see Figure 245). A flotation sample was gathered, and the remaining sediment was worked through 1/4-inch hardware cloth.

Feature Fill

The contents of Feature 32 consisted of a slightly compact dark-gray-brown sandy loam. The sediment was blocky and contained 3 percent fine gravel inclusions. Some charcoal was observed. Minimal insect disturbance was noted.

Chronometric Data

<u>Diagnostic Material Culture</u>

None.

<u>Geochronologic Analysis</u>

The pit was located at the surface of Unit IIA; late Holocene alluvial-fan deposits (Unit III2) overlay the feature. The unconformity between the Unit IIA surface and Unit III2 provides a geochronologic date of ca. 2400–1190 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

<u>Radiocarbon Analysis</u>

None.

Abandonment Processes

The pit fill appeared to be a single uniform stratum. The pit may have been intentionally refilled with sediment after its use. It is also possible that it was naturally filled and that any stratigraphy was obscured by bioturbation.

Stratigraphic Relationships and Associated Features

Feature 32 is not in direct contact with any other features. The nearest pits are Feature 33, 15 cm to the southwest, and Feature 31, 80 cm to the east (see Figure 243), both of which originated in the same stratigraphic unit as Feature 32.

Feature 33

Feature type: nonthermal pit
Age: Chiricahua phase
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.68
Width (m): 0.66
Excavated depth (m): 0.17
Volume (m^3): 0.16

Excavation Methods

Feature 33 was exposed by the backhoe during mechanical stripping of the overburden in MSU 14. Hand-excavation proceeded with the removal of the northwestern half of the feature (SEC 74) in a single level (see Figure 245). A flotation sample and a pollen sample were collected, and the remaining fill was screened through 1/4-inch hardware cloth.

Feature Fill

Feature 33 contained a compact, blocky gray-brown sandy clay. No stratification was apparent. Two pieces of flaked stone debitage were the only cultural materials recovered.

Chronometric Data

<u>Diagnostic Material Culture</u>

None.

<u>Geochronologic Analysis</u>

The pit was located at the surface of Unit IIA; late Holocene alluvial-fan deposits (Unit III2) overlay the feature. The unconformity between the Unit IIA surface and Unit III2 provides a geochronologic date of ca. 2400–1190 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

<u>Radiocarbon Analysis</u>

None.

Abandonment Processes

The pit fill appeared to be a single uniform stratum. It may have been intentionally refilled with sediment.

Stratigraphic Relationships and Associated Features

Feature 33 is not in direct contact with any other features (see Figure 243). Features 31 and 32 are the nearest features. Both nonthermal pits, they are located in the same stratigraphic unit as Feature 33 and may have been contemporaneous.

Feature 38

Feature type: nonthermal pit
Age: Chiricahua phase
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.81
Width (m): 0.71
Excavated depth (m): 0.14
Volume (m^3): 0.17

Excavation Methods

Mechanical stripping exposed Feature 38 in MSU 14. The backhoe removed an unknown portion of the upper part of the pit. Hand-excavation proceeded with the removal of the eastern half of the pit (SEC 91) in a single level (Figures 246 and 247). Flotation and pollen samples were collected, and the remaining sediment was worked through 1/4-inch hardware cloth.

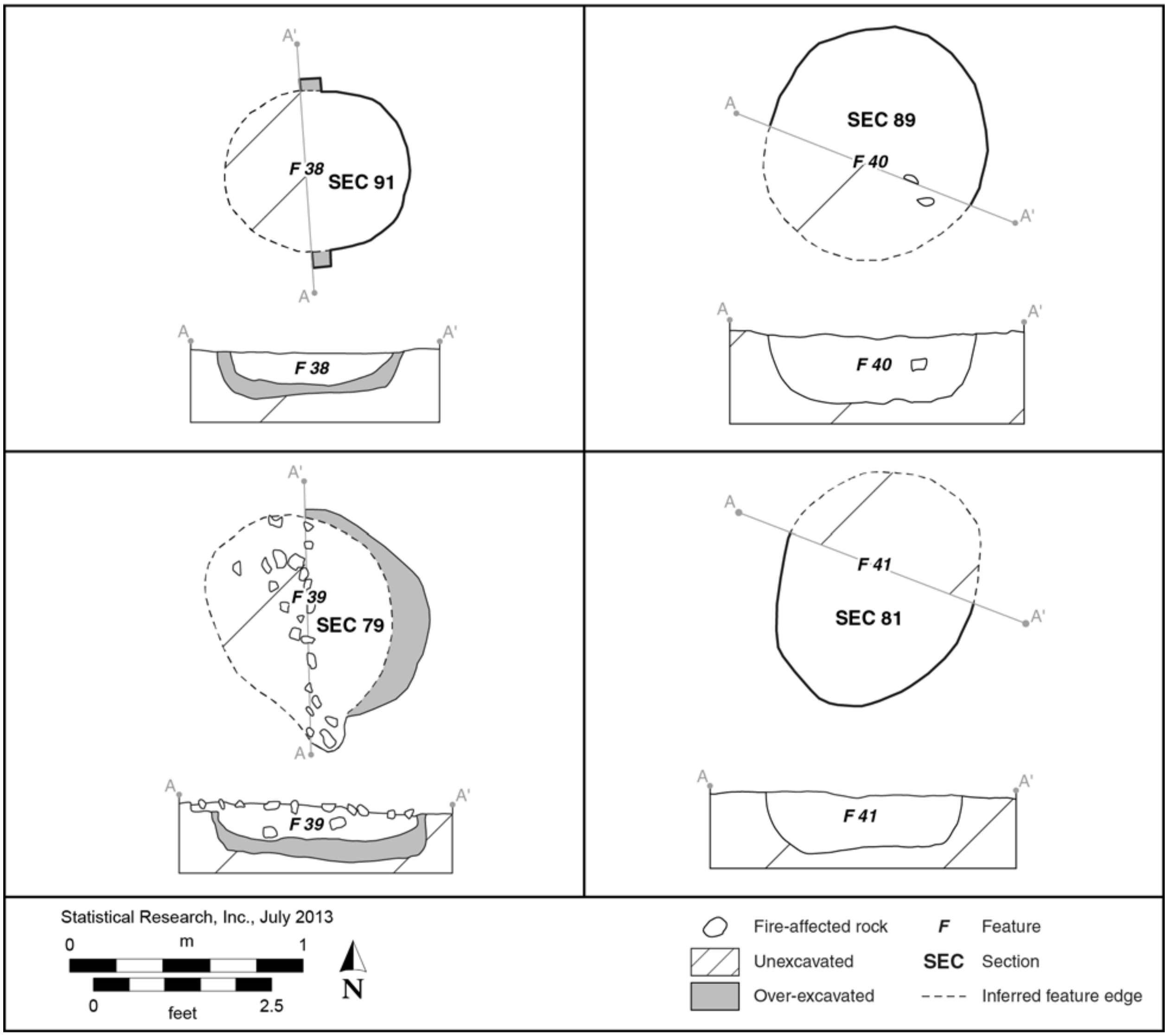


Figure 246. Plan views and profiles of Features 38, 39, 40, and 41.

Figure 247. Photograph of Feature 38.

Feature Fill

The contents of Feature 38 consisted of a compact coarse sandy loam with gravel inclusions. Charcoal, ash, FAR, and oxidized sediments were noted in plan view but were not indicated in the rest of the feature fill. The pit contained no other cultural materials.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

The pit was located at the surface of Unit IIA; late Holocene alluvial-fan deposits (Unit III2) overlay the feature. The unconformity between the Unit IIA surface and Unit III2 provides a geochronologic date of ca. 2400–1190 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Chiricahua phase of the Middle Archaic period.

Radiocarbon Analysis

None.

Abandonment Processes

No evidence of in situ burning was observed in Feature 38. The uppermost fill of Feature 38 contained evidence of burned material, but burned material was not evident in the lower portions of the pit fill. Feature 38 likely represents the remains of an open-air fire or a deflated, shallow pit feature that later filled with natural alluvial sediments.

Stratigraphic Relationships and Associated Features
The nearest feature in the same stratigraphic location is Feature 26, 14.5 m to the southeast (see Figure 243). A cluster of three pits is immediately south of Feature 38, but they originated in different stratigraphic horizons.

Late Archaic to Pioneer Period

Four excavated nonthermal pits at Site 437 were assigned to the Late Archaic to Pioneer period.

Feature 29
Feature type: nonthermal pit
Age: Late Archaic to Pioneer period
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.22
Width (m): 0.20
Excavated depth (m): 0.13
Volume (m^3): 0.01

Excavation Methods
Mechanical stripping exposed Feature 29 on the surface of stratigraphic Unit III2. The backhoe removed an unknown portion of the upper part of the pit. Hand-excavation proceeded with the removal of the southern half of the pit (SEC 57) in a single level (see Figure 245). A pollen sample was collected and submitted for analysis (see Chapters 6 and 7, Volume 2).

Feature Fill
Feature 29 contained a single stratum of compact brown silty loam. Three pieces of FAR were located in the fill but were not collected. An additional three pieces of FAR were noted in the unexcavated portion of the pit. No ash, charcoal, or oxidation was observed.

Chronometric Data

<u>Diagnostic Material Culture</u>
None.

<u>Geochronologic Analysis</u>
The pit originated on the surface of Unit III2; late Holocene alluvial-fan deposits (Unit IV) overlay the feature. The unconformity between the Unit III2 surface and Unit IV provides a geochronologic date of ca. 200 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Pioneer period.

<u>Radiocarbon Analysis</u>
None.

Abandonment Processes
The lack of burned material in the fill of Feature 29 suggests that the feature was used for storage or other processing activities and was later cleaned out and then subsequently filled with natural alluvial sediments.

Stratigraphic Relationships and Associated Features
A cluster of nonthermal pits, Features 30–33, is located 3 m to the west (see Figure 243). Feature 30 originated in stratigraphic Unit IV, dating to the Pioneer to Classic period. Features 31–33 are located on the IIA surface, below Unit III2, and the unconformity between these units has a geochronologic date that corresponds to the Chiricahua phase of the Middle Archaic period.

Feature 39

Feature type: nonthermal pit
Age: Late Archaic to Pioneer period
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 1.00
Width (m): 0.76
Excavated depth (m): 0.24
Volume (m^3): 0.38

Excavation Methods

Mechanical stripping exposed Feature 39 in MSU 14. The backhoe removed an unknown portion of the upper part of the pit, which appeared on the stripped surface as a dense cluster of FAR. Hand-excavation proceeded with the removal of the eastern half of the pit (SEC 79) in a single level (see Figure 246). Flotation and pollen samples were collected, and the remaining sediment was worked through 1/4-inch hardware cloth.

Feature Fill

The contents of Feature 39 consisted of nearly 50 percent FAR; the remaining sediment was unstratified brown silty sand containing granular inclusions that increased with depth. The pit fill also included more silt than did the surrounding matrix. FAR and charcoal were abundant in the upper 10 cm. In total, 46 pieces of FAR were located in the pit. They were not collected, but 3 burned ground stone fragments, identified as a metate, a mano, and an indeterminate ground stone fragment, were collected.

Chronometric Data

<u>**Diagnostic Material Culture**</u>

None.

<u>**Geochronologic Analysis**</u>

The pit originated on the surface of Unit III2; late Holocene alluvial-fan deposits (Unit IV) overlay the feature. The unconformity between the Unit III2 surface and Unit IV provides a geochronologic date of ca. 200 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Pioneer period.

<u>**Radiocarbon Analysis**</u>

None.

Abandonment Processes

Because there was no evidence of in situ burning, Feature 39 is interpreted as containing a refuse deposit from a cooking feature. The pit may have originally been used for some unknown processing or storage activity and later cleaned out and then left open for a period of time, becoming subjected to natural alluvial deposition, as evidenced in the silty sand deposits at the base of the pit. At some point later, Feature 39 was used to deposit cultural refuse, including charcoal and FAR, presumably from a thermal pit.

Stratigraphic Relationships and Associated Features

Feature 39 is not in direct contact with any other features. It is within a small cluster of four pits. Feature 40 is the only pit in that cluster that originated in the same stratigraphic unit (see Figure 243).

Feature 40

Feature type: nonthermal pit
Age: Late Archaic to Pioneer period
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 1.02
Width (m): 0.88
Excavated depth (m): 0.33
Volume (m^3): 0.62

Excavation Methods

Feature 40 was identified during mechanical stripping of MSU 14, Some of the upper portion of the pit was likely removed by the backhoe before it was identified. Hand-excavation of the feature proceeded with removal of the northern half of the feature (SEC 89) in a single level (see Figure 246). The contents were worked through $^1/_4$-inch hardware cloth.

Feature Fill

Two strata were identified. The upper 5 cm was very granular and contained cemented coarse sand and fine gravels. Immediately below that stratum was a layer of brown silty loam with fine orange sand, small charcoal flecks, and approximately 20 percent FAR inclusions. Most of the pieces of FAR were basalt fragments that averaged 6 cm in diameter; a few were over 10 cm in diameter. The FAR was not collected. One mano fragment and a core were recovered from the fill.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

The pit originated at the surface of Unit III2; late Holocene alluvial-fan deposits (Unit IV) overlay the feature. The unconformity between the Unit III2 surface and Unit IV provides a geochronologic date of ca. 200 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Pioneer period.

Radiocarbon Analysis

None.

Abandonment Processes

Based on a lack of oxidation but a high quantity of burned cultural materials, the basal portion of the feature seems to have been intentionally filled during the occupation of the site. The upper portion, however, likely filled in naturally over time, as evidenced in the laminated sands within the upper stratum.

Stratigraphic Relationships and Associated Features

Feature 40 is located in a cluster with three other nonthermal pits. Feature 39 is the only pit in that cluster that originated in the same stratigraphic unit (see Figure 243).

Feature 43

Feature type: nonthermal pit
Age: Late Archaic to Pioneer period
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: indeterminate
Cross-sectional shape: cylindrical
Length (m): indeterminate
Width (m): 0.44
Excavated depth (m): 0.13
Volume (m^3): indeterminate

Excavation Methods

Feature 43 is a nonthermal pit identified in MSU 14 (see Figure 243). It first appeared in plan view as a small, semicircular organic stain. The feature was partially excavated in one section (SEC 62) representing the approximate northern half of the pit. The section was removed in one screened level that terminated at the base of the feature (Figure 248). A flotation sample was collected from the pit fill, and a pollen sample was collected from the base.

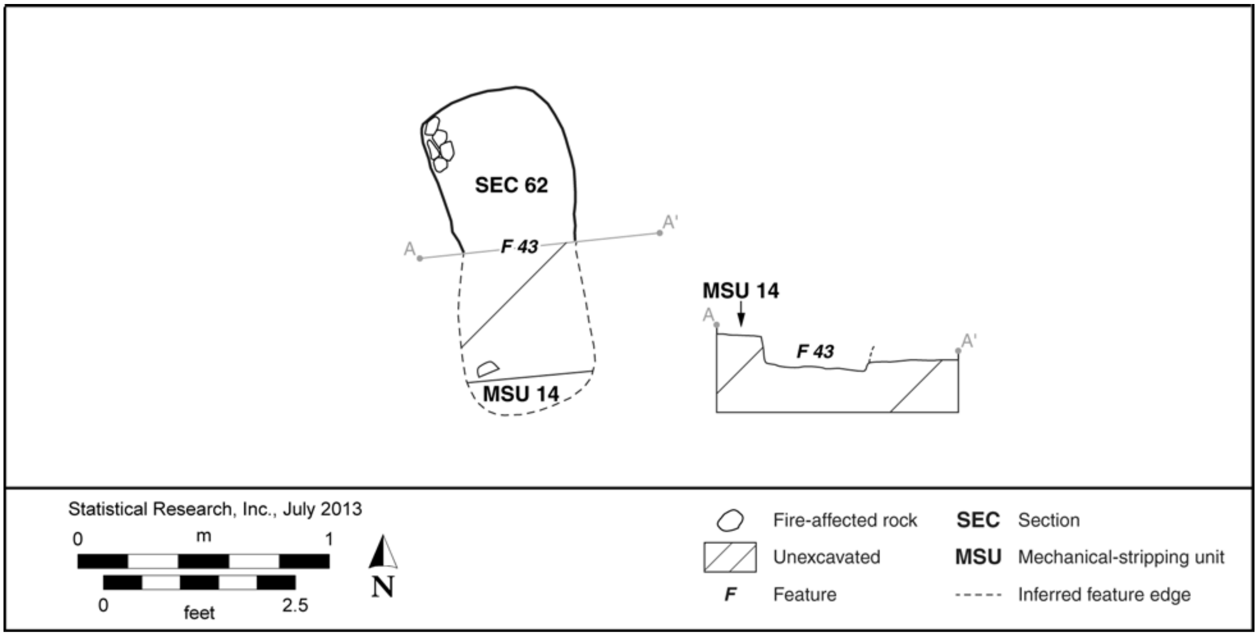


Figure 248. Plan view and profile of Feature 43.

Feature Fill

The pit contained a single stratum consisting of a moderately hard, mottled, brown silt loam. Charcoal and FAR were present but sparse. The FAR was mostly within a small cluster, along with two mano fragments, near the northern edge of the pit (see Figure 248). Oxidized sediments and additional artifacts were not encountered. Insect tunnels were abundant throughout the fill.

Chronometric Data

Diagnostic Material Culture

None.

Geochronologic Analysis

Feature 43 was located at the Unit III2 surface; late Holocene alluvial-fan deposits (Unit IV) overlay the feature. The unconformity between the Unit III2 surface and Unit IV provides a geochronologic date of ca. 200 cal. B.C.–cal. A.D. 610 (see Chapter 2, Volume 2), corresponding to the Late Archaic to Pioneer period.

Radiocarbon Analysis

None.

Abandonment Processes

Based on a lack of oxidation but the presence of burned cultural materials, the feature seems to have been intentionally filled during the occupation of the site.

Stratigraphic Relationships and Associated Features

Feature 43 is located in the northern portion of the site, and no other features are spatially associated (see Figure 243). Three other nonthermal pits (Features 29, 39, and 40) are located in the same stratigraphic position and are considered contemporaneous.

Cienega Phase

One excavated nonthermal pit at Site 437 was assigned to the Late Archaic period.

Feature 41

Feature type: nonthermal pit
Age: Late Archaic period
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 1.02
Width (m): 0.88
Excavated depth (m): 0.25
Volume (m^3): 0.47

Excavation Methods

Feature 41 was exposed during mechanical stripping of the overburden, appearing as a dense cluster of FAR in MSU 14. The backhoe removed an unknown portion of the upper part of the pit. Hand-excavation of the pit proceeded with removal of the southern half (SEC 81) in a single level (see Figure 246). A flotation sample was gathered, and the remaining sediment was worked through 1/4-inch hardware cloth. The excavator collected a pollen sample from the base of the pit.

Feature Fill

A single stratum of fill was recognized in Feature 41. The moderately compact light-brown silty loam included a small quantity of coarse gravel and 47 pieces of FAR; these averaged 7 cm in diameter, and only 2 were collected. Other cultural materials were a complete mano and a mano fragment, both of which were collected. No charcoal or ash was present.

Chronometric Data

<u>**Diagnostic Material Culture**</u>

None.

<u>**Geochronologic Analysis**</u>

The pit originated within Unit III2. The bracketing age range for Unit III2 is ca. 1190–200 cal. B.C. (see Chapter 2, Volume 2), corresponding to the Late Archaic period.

<u>**Radiocarbon Analysis**</u>

None.

Abandonment Processes

No evidence of in situ burning in the form of oxidation of the fill or pit walls was observed in Feature 41. It contained FAR that had likely been heated in another location and then deposited in the pit. That may have been the original function of the pit, or it may have been used for another processing or storage activity.

Stratigraphic Relationships and Associated Features

Feature 41 is within a cluster of four nonthermal pits (Features 38–40), but none are located in the same stratigraphic unit as Feature 41 (see Figure 243).

Pioneer to Classic Period

A single excavated nonthermal pit at Site 437 was assigned to the Pioneer to Classic period.

Feature 30

Feature type: nonthermal pit
Age: Pioneer to Classic period
Locus: Area A
Grid location: not applicable
Level of effort: partial

Plan-view shape: circular
Cross-sectional shape: basin
Length (m): 0.50
Width (m): 0.45
Excavated depth (m): 0.13
Volume (m^3): 0.06

Excavation Methods

Feature 30 was exposed by the backhoe during mechanical stripping of the overburden. The pit is situated on a pedestal above the surrounding MSU, in stratigraphic Unit IV. An unknown quantity of the upper pit fill was truncated by the backhoe. Hand-excavation of the pit proceeded with removal of the southern half (SEC 52) in a single level (Figure 249; see Figure 245). A flotation sample and a pollen sample were collected, and the remaining fill was sifted through 1/4-inch hardware cloth.

Feature Fill

The pit fill was a loose, unstratified sandy loam with slight charcoal staining. Small pieces of charcoal and three moderately burned cobbles were observed in the fill. No other cultural materials were present.

Chronometric Data

<u>**Diagnostic Material Culture**</u>
None.

Figure 249. Photograph of Feature 30.

Geochronologic Analysis
Feature 30 originated in stratigraphic Unit IV, a late Holocene alluvial-fan deposit. The bracketing age range for Unit IV is cal. A.D. 610–1220 (see Chapter 2, Volume 2), corresponding to the Pioneer to Classic period.

Radiocarbon Analysis
None.

Abandonment Processes
No evidence of in situ burning was observed in Feature 30. It may contain a deposit of cooking refuse or coals that were obtained from a thermal feature. Feature 30 may represent a cleanout from such a feature and could be considered a secondary trash deposit. Alternatively, Feature 30 could represent the remains of an open-air fire or a deflated, shallow pit feature that was later filled by natural alluvial processes.

Stratigraphic Relationships and Associated Features
Feature 30 is not in direct contact with any other features. Nonthermal-pit Feature 29 is the closest in both age and physical proximity, but it is in a stratigraphic position dating to the Late Archaic to Pioneer period.

Historical-Period Rancho La Loma Well: AZ T:7:424 (ASM)

Scott Thompson and Heather J. Miljour

This chapter presents the results of archival research and Phase 1 field documentation, as well as a historical significance evaluation, of the Rancho La Loma Well and distribution system located on lands under the jurisdiction of Luke AFB, Arizona. Specifically, the well site is situated in the NW $^{1}/_{4}$ of SE $^{1}/_{4}$ of Section 8, Township 2 North, Range 1 West (Figure 250).

Archival Research

On August 4–5, 2010, and in accordance with the Phase I data recovery plan (Hall et al. 2010:33), SRI Senior Historian Scott Thompson conducted archival research and field reconnaissance to document the history and evaluate the significance of the well and its associated features. During the course of archival research, a variety of documents, including primary and secondary sources, were evaluated for information content and importance. Relevant sources were copied, compiled, and analyzed. From the documents reviewed and the data collected, information was gathered regarding the origins and use of the well and distribution system. The research phase consisted of contacting or visiting the following offices and repositories: Arizona Department of Water Resources, Phoenix; Arizona State Archives, Phoenix; Litchfield Park Historical Society, Litchfield Park, Arizona; Public Works Department, City of Litchfield Park, Arizona; Real Property Office, Luke AFB, Arizona; Sun Health Properties, Inc., Sun City, Arizona; and U.S. Army Corps of Engineers, Arizona Real Estate Office, Phoenix. The documents, maps, and real-property records gathered during the research phase provided information related to the construction, function, and chain of ownership of the well and distribution system and assisted SRI in making an informed assessment regarding the resource's eligibility for listing in the NRHP. During the field investigation, data collection included photographic documentation of the well, pump, and distribution system (aboveground features only), along with the original utility poles that distributed the electricity needed to power the pump unit; descriptions of the structures in terms of their character-defining elements and current condition; and obtaining locational coordinates with a handheld GPS unit.

According to the records on file with the Arizona Department of Water Resources (2010), the well was drilled on March 1, 1952, to a depth of 578 feet. With a casing diameter of 20 inches, the well has a maximum pumping capacity of 1,200 gallons per minute. From 1984 to 2008, the withdrawal of water from the well fluctuated between 70 and 116 acre-feet of water per year. Sun Health Properties, Inc., is the current owner of the well and its appurtenant works.

The well was drilled in 1952 to provide nonpotable water to the Rancho La Loma residential property owned by Mr. and Mrs. P. W. Litchfield and located approximately 1 mile to the southeast. The well was originally situated on a 142.95-acre parcel owned by the Litchfields. Following the deaths of Mr. and Mrs. Litchfield, Edith and A. Wallace Denny—their daughter and son-in-law, respectively—inherited Ranch La Loma and several adjacent parcels. In April 1999, the Denny family deeded the 142.95 acres containing the well site to Sun Health Properties, Inc. In turn, Sun Health Properties, Inc., deeded the property to the Air Force,

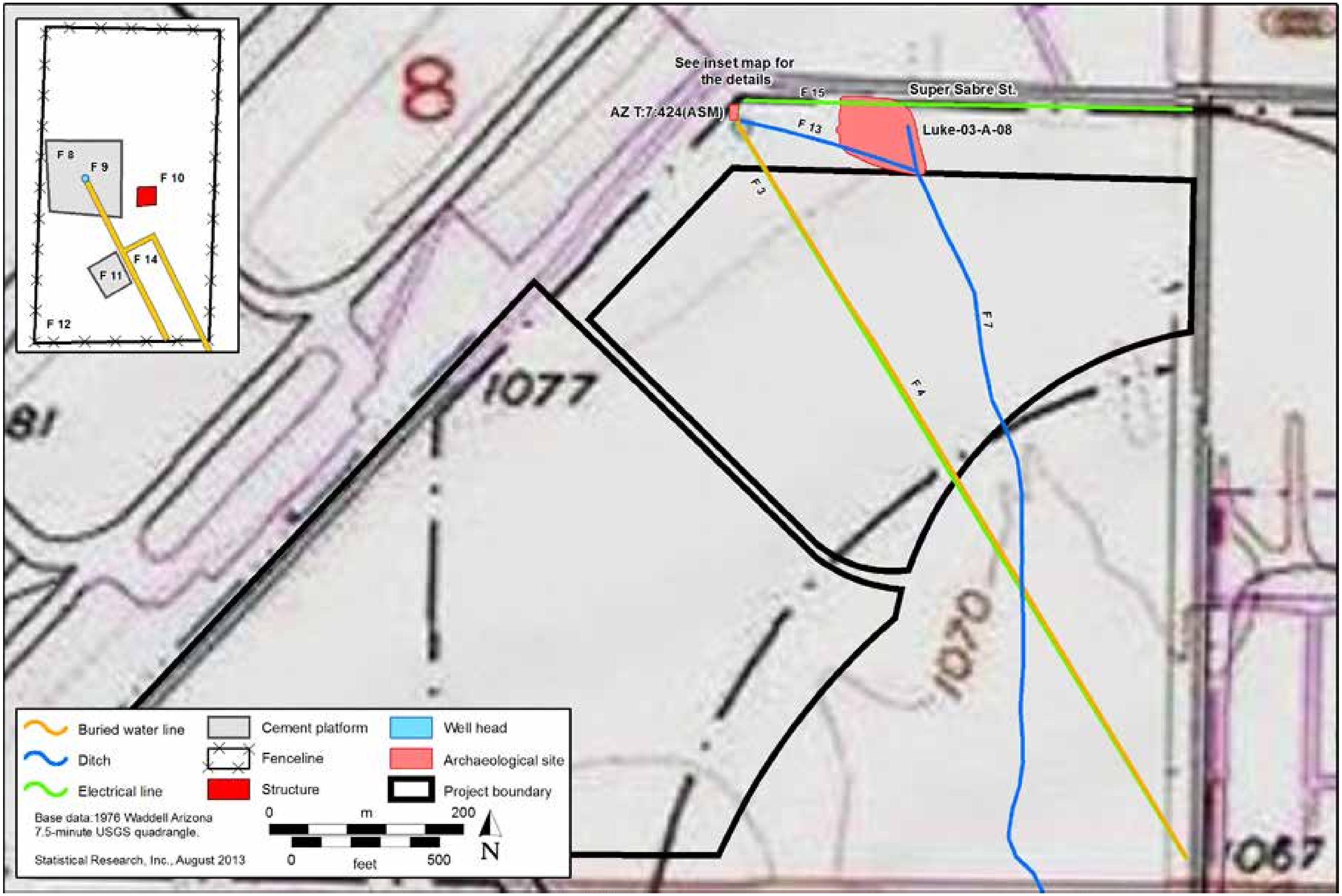


Figure 250. Location of the Rancho La Loma well and appurtenant works.

in 2004, retaining rights only to the underlying groundwater and the well and its appurtenant works. That same year, the Air Force granted Sun Health Properties, Inc., easements for the well site, pipeline right-of-way and electrical distribution line right-of-way (Figures 251–253). The well-site easement is located in the NW 1/4 of the SE 1/4 of Section 8 on a 100-by-120-foot parcel containing 12,000 square feet or 0.275 acres. Luke AFB granted Sun Health Properties, Inc., a 20-foot-wide easement for the underground waterline (Feature 4) that extends from the well site for approximately 2,888 feet in a southeasterly direction, to the southeast corner of Section 8 (see Figure 250). The utility easement consists of a 33-foot-wide strip of land that begins in the northeast corner of Section 8 and extends west for a distance of about 1,661 feet. At present, the well system is operational and conveys water to the Sun Health Properties, Inc., La Loma Campus (located immediately west-southwest of the Rancho La Loma homestead), where it is used for landscaping purposes (Figure 254) (Department of the Air Force 2004a, 2004b, 2004c; Sue Witter, personal communication 2010).

Phase 1 Results

Work at Rancho La Loma Well was performed during Phase 1 (Hall et al. 2010; Hall et al. 2011), and was restricted to recording the content and extent of the well and associated features, including two ditches (Features 7 and 13) and an abandoned, aboveground utility line (Feature 3) (see Figure 250). The aboveground features at the well site consist of a 13-by-13-foot poured-concrete slab (Feature 8) that surrounds the well head and supports the electric pump (Feature 9), a cast-iron-pipe water-distribution system (Feature 14), and a metal shed (Feature 10) that houses an electrical-outlet box for providing power to the pump (Figure 255). A chain-link fence (Feature 12) surrounds the well site (Figures 256 and 257). A line of utility poles (Feature 15) running east–west and parallel to the south side of Super Sabre Street provides electricity to the well site. These are of relatively recent construction (see Figure 250). The original utility poles (Feature 3), which likely date to 1952, are still in place and trend in a southeasterly direction from the well site to the southeast corner of Section 8 (Figure 258). Atop the well head is a vertical-turbine pump that draws groundwater upward to a discharge pipe that is approximately 14 inches in diameter (Figure 259). The discharge pipe is bifurcated with turn-wheel valves that control the delivery of water to either an underground pipeline (for ultimate delivery to Sun Health Properties, Inc., La Loma Campus), or an aboveground discharge pipe that empties into a shallow, unlined ditch (Feature 13). The ditch trends in an east-southeasterly direction for about 300 feet, at which point it intersects with another ditch (Feature 7) in a north–south alignment that continues south to a point near the southern boundary of Section 8 (see Figure 255). Both ditches were visible in a 1954 aerial photograph of the area taken by the Soil Conservation Service (U.S. Department of Agriculture 1954). A careful study of the image revealed that the north-south-trending ditch (Feature 7) was lined with desert vegetation, likely mesquite, suggesting that it had been in use for some time. There was no vegetation in or around the east-southeast-trending ditch (Feature 13), suggesting that the date of the ditch corresponds to that of the construction of the well. Feature 7 may have originally been associated with Luke 03A-08, a previously recorded historical-period homestead located directly east of the well site (see Figure 250). Originally recorded by SRI in 2003 (Tagg et al. 2007), the site was reassessed by SRI in 2005 (Tagg 2007), at which time the segments of the two ditches were recorded as water-conveyance features. Archival research indicated that the artifact scatter was attributed to the occupation of the Teddy Louis Pemma family (1918–1940); however, it is unclear whether the north-south-trending ditch was associated with the Pemma homestead. Extensive disturbance has destroyed much of the integrity of the site; therefore, Tagg (2007) recommended Luke 03A-08 not eligible for listing in the NRHP.

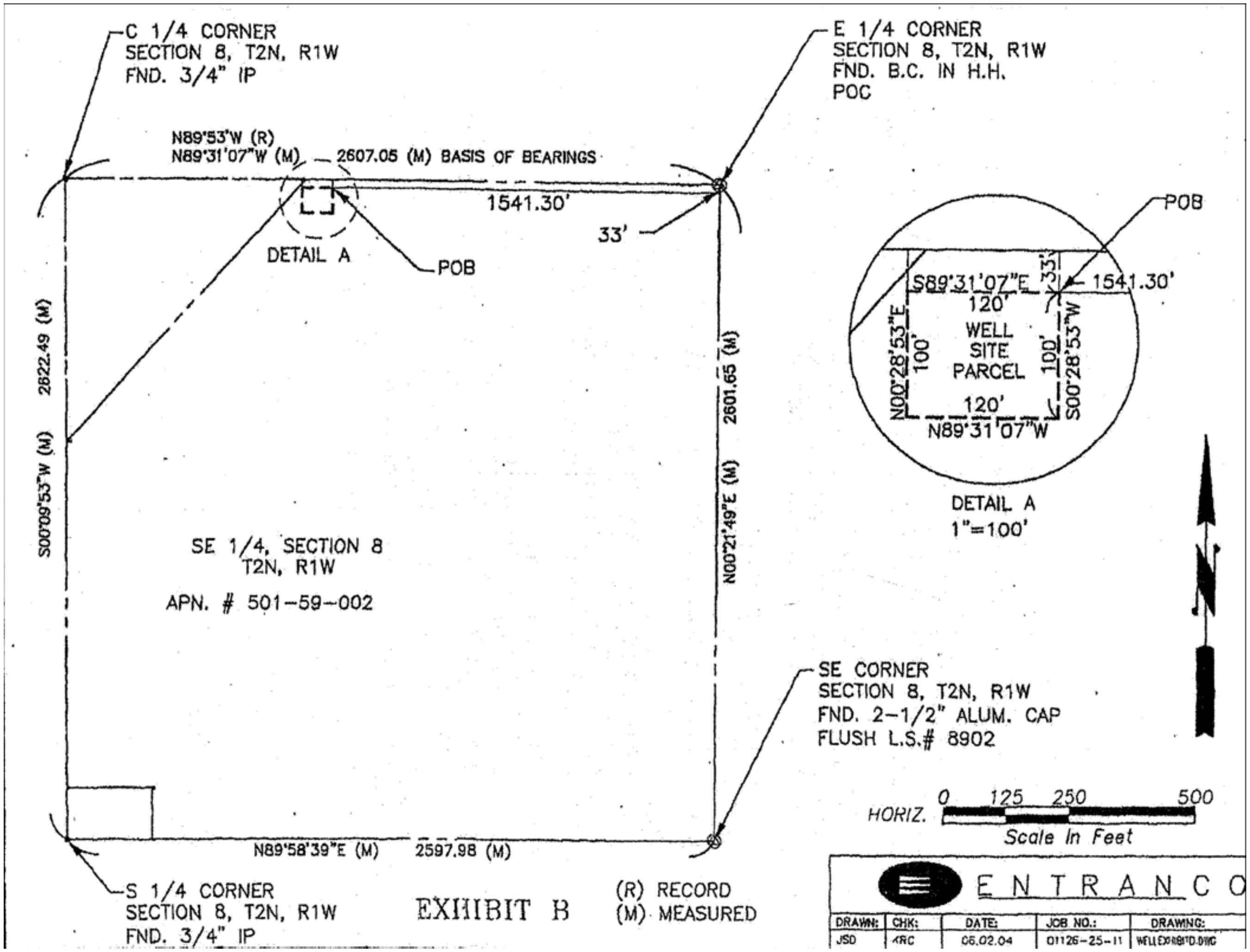


Figure 251. Drawing showing location of easement for the well site in the SE 1/4 of Section 8 (Department of the Air Force 2004a:Exhibit B).

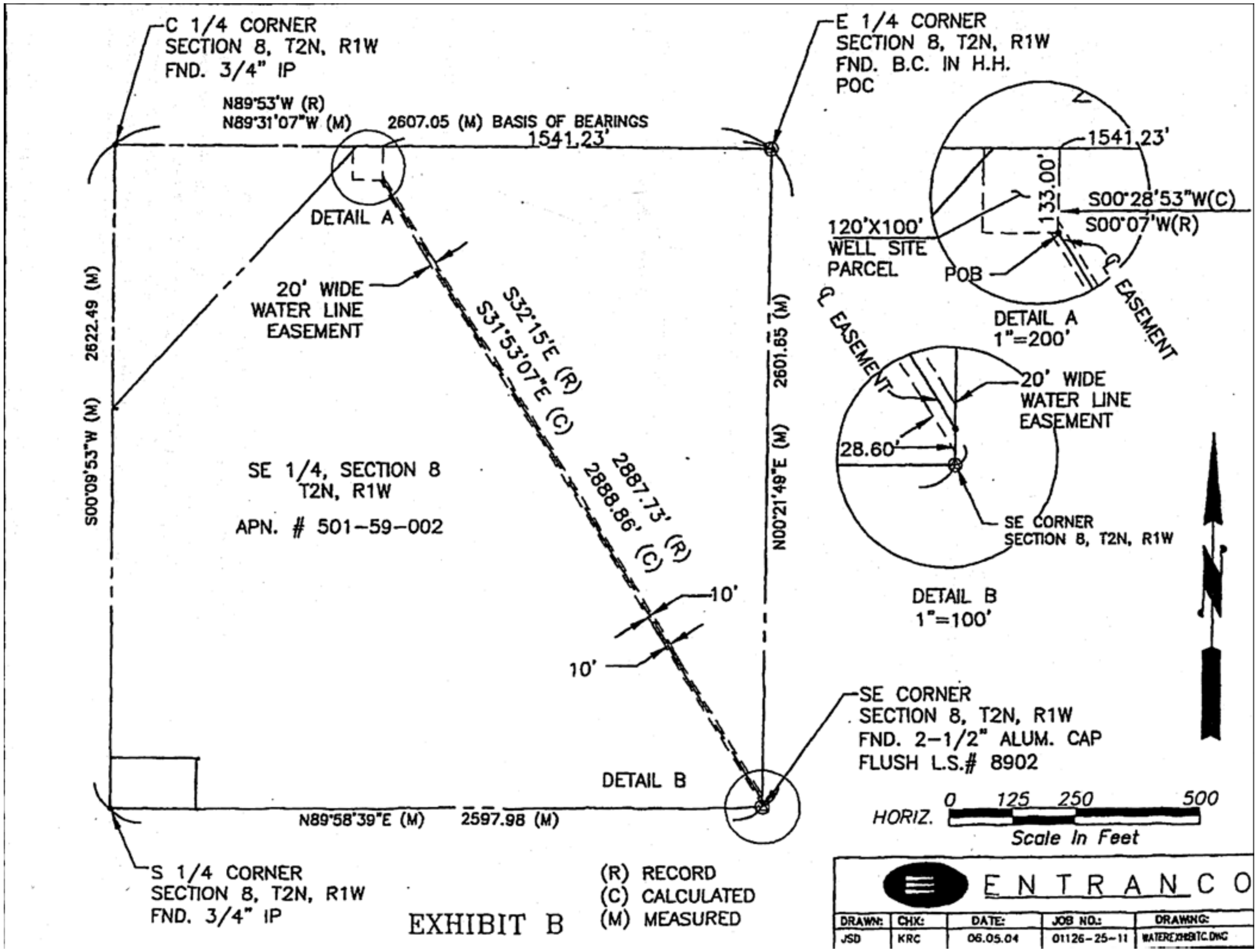


Figure 252. Drawing showing the location of the easement for the underground water line in the SE 1/4 of Section 8 (Department of the Air Force 2004a:Exhibit B).

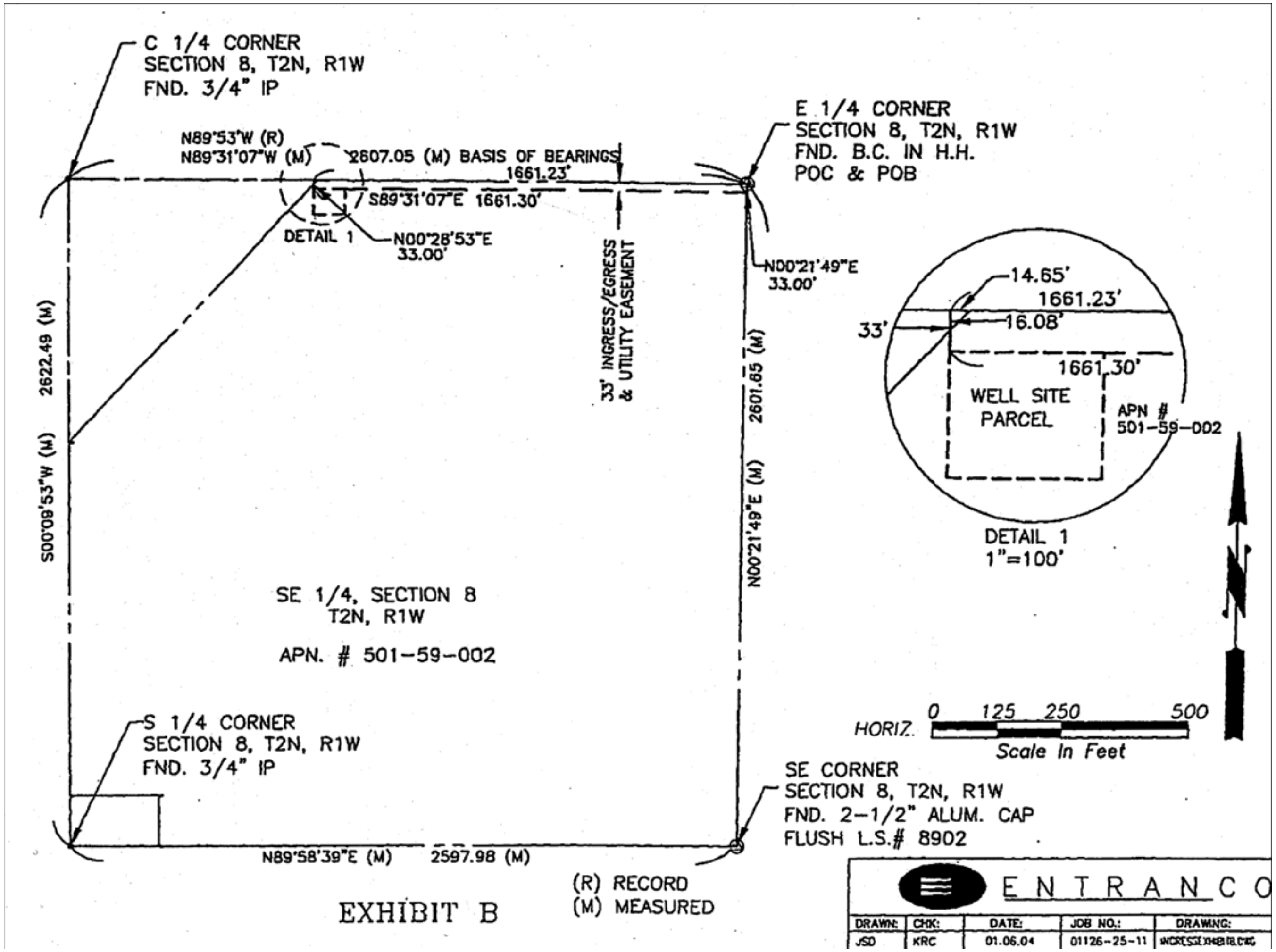


Figure 253. Drawing showing the location of the easement for the utility line in the SE 1/4 of Section 8 (Department of the Air Force 2004a:Exhibit B).

Figure 254. Aerial photograph showing location of the Rancho La Loma well.

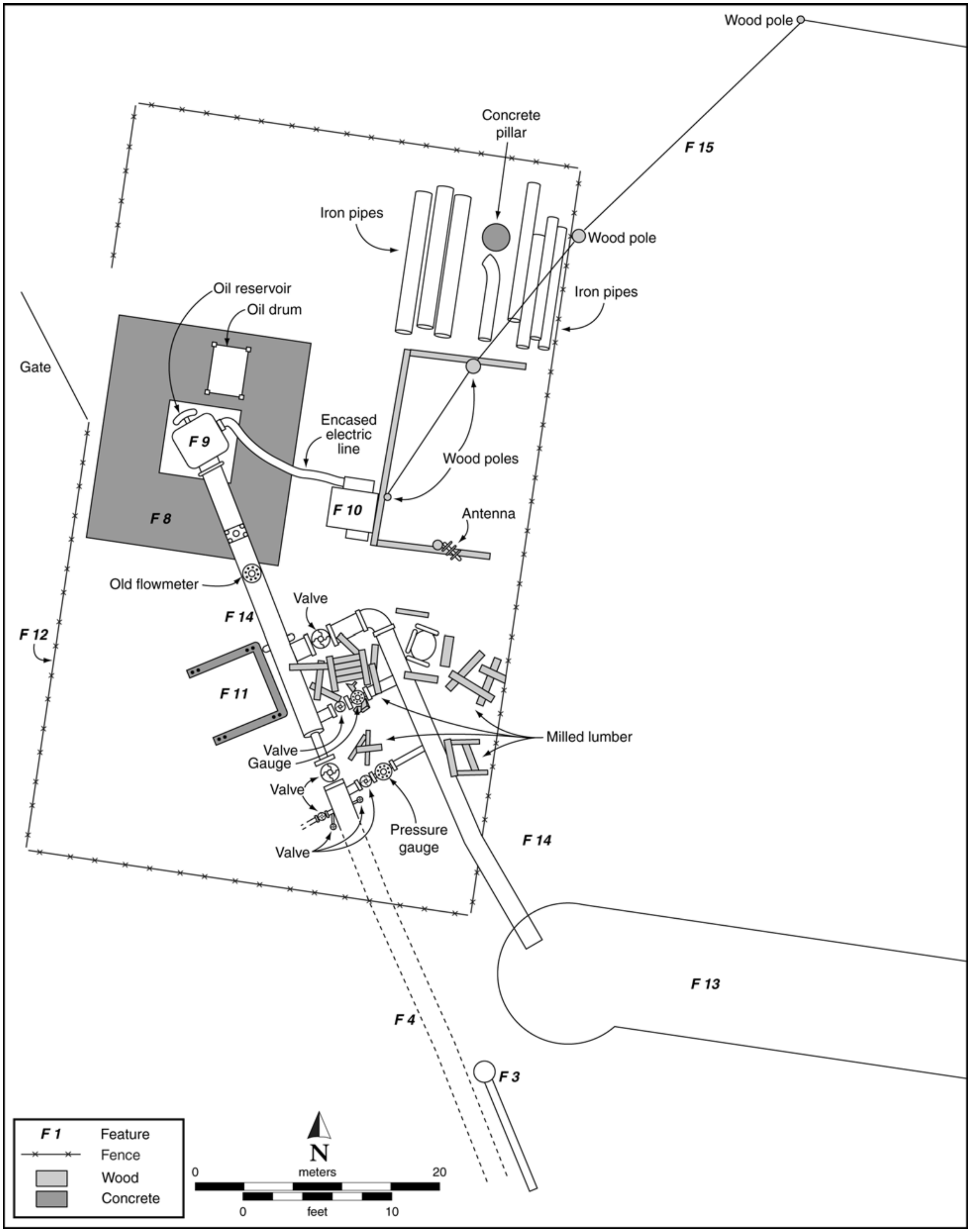


Figure 255. Plan view of the Rancho La Loma Well.

Figure 256. Well site, view to south.

Figure 257. Well site, view to the southeast.

Figure 258. Original utility poles and power lines.

Figure 259. Pump and water-distribution line, view to northeast, August 4, 2010.

Historical-Significance Evaluation

The purpose of the research outlined in this chapter is to evaluate the NRHP eligibility of the Rancho La Loma Well and water-distribution system. The NRHP is the official list of cultural resources recognized for their national, state, and local significance in American history, architecture, archaeology, engineering, and culture and are therefore worthy of preservation (National Park Service 1997:i). To be eligible for listing in the NRHP, a cultural resource must meet one of the four significance criteria defined by 36 CFR 60.4, which reads as follows:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
> (b) that are associated with the lives of persons significant in our past; or
> (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
> (d) that have yielded, or may be likely to yield, information important in prehistory or history. In addition to these four significance criteria, there is a general requirement that the property be 50 years old or older (for exceptions to this rule, see 36 CFR 60.4, Criteria Considerations a–g).

One of the critical components for determining the significance of a cultural resource is the integrity of the property. Integrity is a somewhat nebulous concept that refers to a property's ability to convey its significance. If a cultural resource has been impacted so severely by disturbance, modifications, or other processes as to destroy the qualities that would make it significant under any criterion, typically, it is not considered eligible. The NRHP (National Park Service 1997:44–45) defines seven elements of integrity: location, design, setting, materials, workmanship, feeling, and association. Properties eligible for listing under at least one of the four significance criteria will possess one or more elements of integrity.

SRI's significance assessment of the Rancho La Loma Well is based upon the above four criteria for evaluating the eligibility of properties for listing in the NRHP. According to Dr. William Collins at the Arizona SHPO, Rancho La Loma has not been evaluated for listing in the NRHP (William Collins, personal communication 2010). The City of Litchfield Park acquired the Rancho La Loma property from Sun Health in 2012. According to Chuck Ransom, Director of Public Works for the City of Litchfield Park, there are no immediate plans to evaluate the historical significance of Rancho La Loma or prepare a NRHP nomination for the property (Chuck Ransom, personal communication 2013). It is clear that the well, water-distribution system, and original utility poles and transmission lines are associated with Rancho La Loma. At present, Rancho La Loma remains unevaluated. It is possible that, if the property is evaluated in the future, it may be found eligible for listing in the NRHP. In the absence of an analytical framework for evaluating the historical significance of Rancho La Loma, the Well and water-distribution system must be considered on their own merits. As elements of infrastructure, they are representative of countless other water-supply systems in the area and lack the physical and associative characteristics to convey their historical significance. Therefore, SRI recommends the well and its appurtenant works be considered not eligible for listing in the NRHP.

Even though the aboveground features at the well site and the old utility poles and distribution lines are recommended as not eligible for listing in the NRHP, we propose to treat them as contributing elements to the Rancho La Loma residence, a property that has not been evaluated but may be NRHP eligible. As contributing elements, the well and its appurtenant works were recorded in more detail; the completed Arizona SHPO Historic Property Inventory Form is included in Appendix E. The Rancho La Loma Well and appurtenant works may need to be substantially altered or replaced in the future. If this becomes necessary, the completed inventory form found in Appendix E of this report provides sufficient documentation to mitigate any adverse effects caused by the proposed land-modifying activities associated with the current project or any future undertakings.

CHAPTER 9

Summary of Results

John D. Hall and Robert M. Wegener

The preceding chapters describe the five archaeological sites located in the Luke Solar project area, the field methods used to excavate and document those sites, and the cultural and environmental background of the region. The data obtained from the sites are analyzed in Volume 2 of this series. This chapter is intended to review the information in Volume 1 and to set the stage for the subsequent analysis and interpretation in Volume 2. The following sections summarize the information obtained for each archaeological site in the Luke Solar project. Then, the research questions presented in Chapter 2 of this volume are preliminarily explored, using the field- and laboratory-analysis data.

Summary of Site Information

Falcon Landing (AZ T:7:419 [ASM])

Falcon Landing represents an extensive, multicomponent prehistoric and Historical period site, though the historical-period component was relatively minor. The portion of Falcon Landing preserved within the APE consisted of over 43 contiguous acres of buried cultural resources (see Chapter 4). Falcon Landing represents about 98 percent of the features identified and artifacts collected during the Luke Solar project. As a result, Falcon Landing is the main focus of both Volumes 1 and 2. In total, 3,006 cultural features were identified at Falcon Landing, including 48 structures and possible structures, 14 activity areas, 2,738 extramural pits, 19 caches, 65 charcoal/ash lenses, 109 FAR concentrations, 9 postholes, 2 middens, a possible reservoir, and a human burial (see Table 7).

The vast majority of features at Falcon Landing were assignable to chronological groups based on a relatively limited number of radiocarbon dates as well as the natural stratigraphy of the site. Dating the natural stratigraphy involved a complex sequence of analyzing the radiocarbon dates from feature and nonfeature contexts and correlating the sequences of deposition across the APE (see Table 9). The resulting geochronology allowed for the assignment of nearly every feature at Falcon Landing to a chronologic group (see Chapter 2, Volume 2). In total, 34 chronologic groups resulted from the geochronology (see Table 8). The chronologic groups correspond to the culture history defined in Chapter 2 (see Figure 6), including the Cochise cultural sequence developed by Sayles and Antevs (1941) for the Archaic period features and the Dean (1991) sequence for the Early Ceramic period and Hohokam occupation of the project area. Many of the chronologic groups represent a single phase each, such as the Chiricahua phase of the Middle Archaic period. These groups resulted from features with individual radiocarbon dates that provided precise age ranges or features within natural strata that had precise depositional dates. Other chronologic groups span several phases or periods and represent features located at stratigraphic boundaries. In some cases, a feature was intrusive into the upper surface of a stratum, with a younger stratum overlying the surface, creating an unconformity. In the case of an unconformity, the feature was assigned the latest date for the stratum it intruded and the earliest date for the overlying stratum. Sometimes this unconformity date range was quite broad, making the age assigned to a particular feature very broad, as well. For example, a feature at the surface of Unit IIA with overlying Unit IV results in a date range of 2420 cal. B.C.–cal. A.D. 610, which spans the Middle Archaic period through the Pioneer period. Thus, a feature at that stratigraphic boundary would be considered poorly dated. The dates obtained for most features using the unconformity method were too imprecise to consider in subsequent analyses. Fortunately, hundreds of features at Falcon Landing were assigned to particular cultural phases and therefore could be used to further the analysis of contemporaneous feature groups and associated material culture, as discussed in Volume 2.

Spatial and temporal analyses of Falcon Landing revealed that discrete clusters of spatially associated and likely contemporaneous features exist throughout the site (see Chapter 10, Volume 2). Important chronologic groups represented by multiple features include the Chiricahua, San Pedro, Cienega, and Red Mountain phases. The presence of numerous features belonging to these chronologic groups indicates a continuity of occupation at Falcon Landing from the Middle Archaic period through the Early Ceramic period. Furthermore, these discrete clusters of structures and associated extramural features indicate that some of the occupations represented multiple activities and, perhaps, short-term, temporary encampments. So, Falcon Landing can be characterized as an occupational palimpsest of intermittent, seasonal occupations, evidence of which became periodically buried under natural sediments, and subsequent reoccupations in later periods.

AZ T:7:68 (ASM)

Site 68 is a large prehistoric archaeological site; however, only about 3 percent of the northern portion of this previously recorded site lies within the APE (Adams 1991; Hall et al. 2011). Site 68 is immediately south of Falcon Landing and extends several hundred meters to the south of LAFB. Phase 1 and 2 data recovery efforts in the portion of Site 68 within the APE resulted in the identification of 37 buried cultural features: 2 structures, 1 human burial, 1 artifact concentration, and 33 extramural pits (see Chapter 5). The Site 68 features were grouped into three chronologic components based on stratigraphic positions and one component derived from radiocarbon dating. Thirty-five features had stratigraphic dates at Site 68, and the chronologic groups included the Early to Middle Archaic period (n = 5), the Middle to Late Archaic period (n = 15), and the Late Archaic to Protohistoric period (n = 15). Unfortunately, the stratigraphic dates were generally very broad and made temporal associations difficult within and among the chronologic groups. The Middle to Late Archaic period group, however, had an associated date range of 1380–920 cal. B.C., spanning approximately 400 years across the age ranges defined for the Middle and Late Archaic periods. This component included a structure, a human burial (secondary cremation), and 13 nonthermal pits (including 1 large bell-shaped pit). Radiocarbon-dated features included 1 structure and 1 extramural pit, both of which dated to the Snaketown phase (cal. A.D. 650–780). As a result, it appears that the portion of Site 68 within the APE was occupied intermittently from the Middle Archaic period through the Hohokam Pioneer period. Activities represented at Site 68 likely included plant processing and storage, as evidenced by the large bell-shaped pit, and numerous possible processing features. The presence of 2 ephemeral house-in-pit structures suggests that individuals or a small group of people visited the site for a duration long enough to require shelter. The presence of a secondary cremation also suggests a slightly longer duration of occupation.

AZ T:7:423 (ASM)

Site 423 was a small, limited-activity site located to the southwest of Falcon Landing. Phase 1 and 2 data recovery efforts at Site 423 resulted in the identification of four prehistoric features: three extramural pits and an FAR concentration (see Chapter 6). The features at Site 423 were grouped into two chronologic components based on stratigraphic position and one component derived from a radiocarbon date. A single nonthermal bell-shaped pit was assigned to the Early to Late Archaic period, and two nonthermal pits were assigned to the Late Archaic to Classic period. A single FAR concentration was radiocarbon dated to the Red Mountain phase (cal. A.D. 10–130). The small number of features at Site 423 suggests that the site was a limited-activity resource-procurement staging and processing locale.

AZ T:7:437 (ASM)

Site 437 was a small, limited-activity resource-procurement and –processing locale (see Chapter 7). Site 437 was located about 130 m east of Falcon Landing, across a small drainage. The site was originally identified as a single buried feature located during the intersite-trenching phase. Subsequent Phase 2 mechanical stripping uncovered an additional 17 buried features: 16 extramural pits and a FAR concentration. The original feature identified during intersite trenching was a thermal pit radiocarbon dated to the Sulphur Spring phase (7040–6690 cal. B.C.) of the Early Archaic period, and it represents the oldest directly dated feature in the project area.

Rancho La Loma Well (AZ T:7:424 [ASM])

The Rancho La Loma Well is a Historical period well and water-conveyance system (see Chapter 8). The main well pad and associated features are approximately 50 m north of the APE. Portions of the underground water line and aboveground utility line that lead to and from the well cross the APE. The well was built in 1952 to provide nonpotable water to the Rancho La Loma residence, owned by Mr. and Mrs. P. W. Litchfield, located about 1 mile to the southeast. The Rancho La Loma property and, by extension, the well and associated distribution-system easement have since changed ownership and are now operated by Sun Health Properties, Inc.

Research Themes

SRI used three broad research themes to investigate the data obtained from the Luke Solar project. Originally presented in the HPTP (Hall et al. 2011), these themes are chronology, cultural affiliation, and land use (see Chapter 2). The research themes are part of an overall research strategy to examine past lifeways and to try to understand how the people who occupied the project area interacted within both the natural environment and the sociocultural environment over time. Each research theme also has a set of specific questions to help focus the research and guide the analysis presented in Volume 2. The following discussion provides a brief overview of the research themes and uses preliminary data to make informed inferences concerning the prehistoric occupation of the Luke Solar project area. Because the majority of the features, artifacts, and ecofacts were recovered from Falcon Landing, the following discussion is based mostly on the data from that site; however, the occupational and subsistence trends discussed below involve placing the Luke Solar project into a broader environmental and cultural context. Falcon Landing and the other Luke Solar project sites are considered a small part of a larger cultural landscape. So, in general, the information provided below refers primarily to Falcon Landing, but when data from the other sites are used, the sites will be mentioned specifically.

Chronology

Individually and stratigraphically dated features indicated that portions of the Luke Solar project APE contain an archaeological record representing over 5,000 years of aboriginal activity and intermittent occupation. A strategic approach to radiocarbon dating and the resulting geochronology allowed assignment of nearly every identified feature to a chronologic component (see Chapter 4; see also Chapter 2, Volume 2). One individual feature at Site 437 represents the earliest-dated feature in the project area, with a date range of 7040–6690 cal. B.C., corresponding to the Sulphur Spring phase of the Early Archaic period. No other Early Archaic period materials or features were confidently identified in the project area. The overwhelming majority of aboriginal occupation in the Luke Solar project area was associated with Falcon Landing, which is the main focus of both Volumes 1 and 2. The Chiricahua phase of the Middle Archaic period is the best-represented time period, including over 700 radiocarbon-dated or stratigraphically dated features at

Falcon Landing. Other important chronologic groups include the San Pedro and Cienega phases of the Late Archaic period and the Red Mountain phase of the Early Ceramic period.

Geochronology and Prehistoric Landscape Context

LAFB is located on the lower-*bajada* slopes of the White Tank Mountains, which are about 7 miles to the west; the Agua Fria River is located approximately 3 miles to the east. This lower-*bajada* landscape is a relatively flat, nondescript alluvial plain. Previous research of Archaic period settlement patterns has considered these lower-*bajada* environments to have been undesirable locations for Archaic period occupation (see Roth and Freeman 2008). In most areas of southern and central Arizona, this observation is likely quite accurate; however, a geomorphic feature south of LAFB created a unique environment desirable to aboriginal groups. The Luke Salt Body, an extensive and deeply buried deposit of salt, has created several uplifts, one of which is about 1 km south of LAFB (see Volume 2, Chapter 2). This uplift is responsible for an elevated water table and the funneling of surface flow to a low area south of LAFB. This low-lying area may have supported a small, marshy/*cienega* environment or mesquite bosque. It was the presence of this surface and/or near-surface water and the plant communities that the water likely supported that attracted Middle and Late Archaic period groups to the Luke Solar project area as they conducted their seasonal rounds in this region of the Sonoran Desert.

Prehistoric Cultural Affiliation

The results of the geochronology show that the Luke Solar project area was occupied intermittently from the Early Archaic period through the Historical period. Early Archaic period groups left little trace in the APE: only a single thermal pit (at Site 437) was radiocarbon dated to the Early Archaic period. The subsequent Middle and Late Archaic periods are well documented at Falcon Landing, with hundreds of features represented. The largest chronologic component was the Chiricahua phase, indicating that Falcon Landing was occupied intermittently beginning around 3300 cal. B.C. For the purposes of this project, the Chiricahua phase has been divided into early and late phases to denote the beginning of the Early Agricultural period described by Huckell (1995), despite an apparent absence of agricultural traces in the Luke Solar project area. In the context of the Luke Solar project, the lack of agricultural practices made comparisons difficult between the archaeological deposits at Luke Solar with the significant sites reported along the Santa Cruz River in the Tucson Basin. For example, the span of the late Chiricahua phase as defined here has been reported as the 'unnamed interval' by Mabry (2005:2) as well as the Silverbell phase by Whittlesey et al. (2010:6) for the beginning of the Early Agricultural period in the Tucson Basin. Using the Early Agricultural terminology; however, seemed inappropriate at Luke Solar when agriculture was conspicuously absent. The addition of the early and late Chiricahua phases should be considered a simple heuristic device, allowing the comparison of early (3500–2100 cal. B.C.) and late (2100–1200 cal. B.C.) Chiricahua phase contexts. For instance, did the introduction of maize in the Tucson Basin around 2100 B.C. result in any meaningful differences in the use of the Luke Solar sites? Investigating these changes, as well as the overall chronological and spatial analysis of features will be expanded upon and discussed further in Volume 2, Chapters 10 and 11.

Over 700 features at Falcon Landing were assigned to the Chiricahua phase, including structures, activity areas, FAR concentrations, a sheet midden, and numerous extramural pits. The variety of feature types for Chiricahua phase occupations indicates a diversity of activities and includes at least brief periods of residence. The late Chiricahua phase was not as well represented at Falcon Landing, but the ability to compare these two contexts may provide meaningful information concerning subsistence strategies during Middle Archaic period intervals before and after maize was introduced into the U.S. Southwest. A relatively substantial Late Archaic and Early Ceramic period occupation was also apparent: numerous features were assigned to the San Pedro, Cienega, and Red Mountain phases. The subsequent Hohokam occupations were limited and were represented by only a few features. Hohokam groups likely did not occupy the site as frequently as the preceding Archaic period groups, or for similar durations.

Land-Use Patterns

Falcon Landing likely represents a resource-procurement and -processing locale associated with the mesquite bosque south of LAFB. The presence of a perched water table and possible bosque environment would have provided a higher diversity of desirable natural resources than other lower-*bajada* locations. It appears that over time, the site was used as a plant-resource-procurement and -processing locale or a short-term encampment for plant-resource collection and processing, with occasional, more-intensive seasonal habitations representing larger groups or longer durations of occupation. Evidence for this includes discrete clusters of contemporaneous features and a variety of feature types (e.g., structures, activity areas, and middens). These more-intensive occupational episodes likely reflect periods of relative resource abundance.

Another important aspect of land use is the presence of human burials. Human burials were rare within the project area. Only two burials were identified, one from Falcon Landing and one from Site 68. The scarcity of burials within the project area is likely a consequence of land-use practices. The groups of people who occupied the project area did not reside for durations that were long enough to inter their deceased. Individuals who died in the project area may have been relocated to more-permanent residences or base camps.

Subsistence

The results of the ecofact analysis revealed several important factors of aboriginal subsistence. Macrobotanical remains (see Chapter 6, Volume 2) showed an overwhelming dominance of mesquite (*Prosopis* sp.) wood, with only a few seeds represented. Other charred plant parts included saltbush (*Atriplex* sp.), saguaro (*Carnegiea gigantea*), ocotillo (*Fouquieria splendens*), horse purslane (*Trianthema portulacastrum*), creosotebush (*Larrea tridentata*), cheno-am (*Chenopodium/Amaranthus*) seeds, globemallow (*Sphaeralcea* sp.), grasses (Poaceae and *Panicum* spp.) stems and caryopses, plantains (*Plantago* spp.), and several unknown plants. The dominance of mesquite is believed to represent not only the natural abundance of these trees but also a focus on the processing of mesquite pods for subsistence. Currently, neither saguaro nor ocotillo are naturally occurring in the project area; therefore, these cultural plant remains may have been imported to the site. Both species were recovered from Chiricahua phase contexts, suggesting that Middle Archaic period groups visited upper-*bajada* environments prior to their occupation of Falcon Landing. Saltbush, purslane, cheno-ams, and grasses are also plants with economic potential and were likely abundant within the project area.

The palynological analysis (see Chapter 7, Volume 2) included a much higher diversity of taxa than the macrobotanical analysis. Preserved pollen remains were dominated by cheno-am, sunflower family (Asteraceae), and grasses. Other important taxa included cottonwood (*Populus* sp.) and possibly cattail (*Typha* sp.), suggesting a more mesic environment. Cactus was also represented, suggesting a connection to upper-*bajada* environments. The results from both the macrobotanical and pollen analyses suggest predominantly summer occupations and some late-spring or early-fall activities, as well.

After stone artifacts, faunal remains were the second-most-prevalent artifacts recovered (see Chapter 4, Volume 2). The most common identifiable taxa in the faunal collection were jackrabbits and cottontails (Leporidae), although other mammals, amphibians, reptiles, and birds were also present to lesser degrees. Another interesting aspect of the faunal collection was the presence of numerous *Olivella*-shell beads. One was recovered from a San Pedro phase structure, and over 200 were recovered from a pit dated to the Middle to Late Archaic period. These *Olivella* shells were imported from the Gulf of California, through either direct procurement or trade.

Technological Trends

Results of material culture analysis show several general trends of technology. The stone artifact assemblage is the most diverse and important for the project (see Volume 2, Chapter 3). Flaked stone debitage is dominated by bifacial reduction debris. This suggests the site occupants were primarily engaged in manufacturing or maintaining bifaces. Cores are the dominant flaked stone tool type, followed closely by cobble unifaces, projectile points, hammerstones, edge-modified flakes, and bifaces. Few scrapers, drills, and knives were recovered. Both debitage and flaked stone cores are dominated by locally available volcanic raw materials, particularly basalt and rhyolite, likely obtained from the nearby Aqua Fria River channels. The projectile points recovered from the project area are almost exclusively associated with the Middle and Late Archaic occupations, with one Hohokam Colonial stemmed recovered from the modern surface of Falcon Landing. The diagnostic projectile point types include Chiricahua (n = 9) and Cortaro (n = 4) representing Middle Archaic styles, and San Pedro (n = 9) and Datil (n = 3) representing the Late Archaic styles. Other diagnostic points include Elko corner-notched (n = 2) and a single contracting stem or leaf-shaped point, believed to be Middle or Late Archaic in age. Over 30 indeterminate point fragments were also recovered, but are only identifiable as dart points. These points and point fragments, along with the abundant biface reduction debris, suggests that biface production and maintenance were important site activities. The paucity of artiodactyl remains, however, suggests that the site may have also functioned as a staging locale where dart points were produced and repaired, likely in support of hunting in the nearby uplands of the White Tank Mountains or along the riparian corridor of the nearby Aqua Fria River.

Another salient technological trend was the high investment in the transport and use of a robust ground stone technology (see Volume 2, Chapter 3). Ground stone items include predominantly manos and metates, but mortars and a large number of pestles are also present. A unique type of ground stone tool has also been identified in the collection, referred to as Lukeoliths. These Lukeoliths are generally large oval-shaped cobbles and exhibit a wide variety of use-wear patterns indicative of multiple possible functions. Over 7,000 pounds of ground stone was recovered from the project area indicating a significant effort was made over time to transport these large implements to the site for processing activities. The primary source for all flaked and ground stone tools was likely the Agua Fria River, located about 3 miles to the east. Evidence exists that ground stone tools were cached in the project area, allowing mobile groups to reoccupy this desirable plant-processing location on a seasonal or sporadic basis and reuse tools without the investment of obtaining or manufacturing new ground stone tools.

Ceramic artifacts were poorly represented in the project area (see Volume 2, Chapter 5). Of the thousands of features identified, only seven contained ceramics. Only 126 sherds were recovered from the project area, mostly from the modern ground surface of Falcon Landing and Site 423. The majority of ceramics were classified as Gila Plain (Gila variety and Salt variety), with a few Sacaton Red-on-buff, and two possible incipient plainware sherds from Late Archaic period contexts. Though small, the ceramic assemblage indicates an infrequent use of ceramic containers within the project area, likely related to the processing and storage of food resources.

Settlement, Demography, and Social Organization

Following Binford (1980, 1994) Falcon Landing functioned as both a logistical field camp and a short-term residential camp. Periods of occupation during the Middle and Late Archaic period indicate a more intensive occupation including structures, activity areas, middens, and numerous extramural features. These occupations likely represent residentially mobile groups visiting the site for the procurement and processing of plants, notably mesquite, and hunting small game such as rabbits. The presence of potential household groups, or discrete clusters of contemporaneous structures and extramural pits, suggests that the occupation of the site involved groups of varying sizes, perhaps related to the abundance of natural resources. These occupations were most intense during the Chiricahua, San Pedro, Cienega, and Red Mountain phases (see Chapter 10, Volume 2). Following the Red Mountain phase, including the Hohokam pre-Classic and Classic periods as well as the Protohistoric period, the site was apparently occupied much less frequently and intensely, likely indicative of a more logistical field camp where small groups visited the site for resource procurement and/or processing.

Interaction, Exchange, and Cultural Boundaries

Falcon Landing represents one location in a larger spectrum of foraging behavior. Middle and Late Archaic and Early Ceramic period groups visited the site as part of their seasonal round that included the upper-*bajada* and possibly the upland zones (i.e., Central Highlands Physiographic Zone). Evidence for this includes the presence of upper-*bajada* plant remains, such as charred saguaro and ocotillo wood, as well as traces of other types of cactus pollen (see Chapters 6 and 7, Volume 2). Though the stone artifacts were almost exclusively manufactured from locally derived materials (Agua Fria River gravels), a few pieces of obsidian were recovered. This obsidian was obtained from two geologic sources, the Vulture and San Francisco volcanic sources. The Vulture source is located about 70 km northwest of Falcon Landing, whereas the San Francisco (Government Mountain) source is located about 200 km north. The Vulture source can reasonably be considered a semi-local source for Falcon Landing, but the Government Mountain source suggests the occupants were tied to upland resources for part of the year, or they maintained and participated in a regional exchange network. Another nonlocal material mentioned above are numerous olivella shells obtained from the Gulf of California, located about 250 km to the southwest. Similar to the Government Mountain obsidian, the *Olivella* shell may have been directly procured, or was obtained through trade networks.

Regional Considerations

Falcon Landing is both similar and dissimilar to other Archaic sites in the region. The most comparable site to Falcon Landing is Last Ditch (Hackbarth 1998, 2001; Phillips et al. 2001; Rogge 2009). The types and relative frequencies of features appear consistent between the two sites. Last Ditch is considered a middle-lower *bajada* site, encompassing the Upper Sonoran biotic community, and has a slightly higher elevation than Falcon Landing. Falcon Landing is attributed to a lower *bajada* environment. The Picacho Reservoir project (Bayham et al. 1986) represents another well-documented Middle Archaic occupation. The sites in the Picacho Reservoir project include a short-term winter camp associated with San Jose/Pinto projectile points, and a long-term summer and fall base camp associated with Chiricahua projectile points. These sites reveal an apparent social complexity based on the diversity of projectile point styles, as well as different mobility and subsistence strategies. Falcon Landing seems to lack the social complexity associated with different projectile point styles, but represents a continuum of Archaic and Early Ceramic occupation lacking at Picacho Reservoir.

Some of the best documented Archaic occupations in Arizona are located in the Tucson Basin. Numerous Archaic sites are located in the floodplain of the Santa Cruz River, including Los Pozos, Las Capas, Santa Cruz Bend, and several others (Diehl 2005; Gregory 1999b, 2001a; Mabry 1998, 2008; Sliva 2005; Whittlesey et al. 2010). Other important sites in the Tucson Basin are located along Cienega Creek (Eddy and Cooley 1983; Huckell 1990, 1995). The Tucson Basin sites differ greatly from Falcon Landing in that they have ample evidence of maize agriculture, hence the use of the term Early Agricultural period for these Middle and Late Archaic sites. The Tucson Basin sites also show early use of irrigation along the floodplain, including canals (Mabry 2005, 2006) and gridded fields (Brack 2010; Herr 2009). Ritual objects, such as ceramic effigies, as well as an overall relatively higher artifact diversity has been recovered from these floodplain sites. Falcon Landing lacks the ritual items, with the exception of olivella shell beads and has less artifact diversity. This difference is likely related to the relative settlement patterns. Tucson Basin Archaic sites were likely residential base camps tethered to floodplains where early agriculture was practiced. Falcon Landing functioned similarly but was specifically tied to upland or nonriverine resources where agriculture was not practiced. Another site similar to Falcon Landing is Coffee Camp (Halbirt et al. 1993), which is located on the Santa Cruz flats in the northern Tucson Basin. Like Falcon Landing, Coffee Camp also lacks evidence of agriculture, and according to Huckell (1996:345), the occupants of Coffee Camp were engaged in a persistent Late Archaic hunting-and-gathering economy located on the fringes of the Tucson Basin.

APPENDIX B

How to Guide

Internet Explorer: Download and Install Adobe Reader

Follow these steps to install Adobe Reader using Internet Explorer.

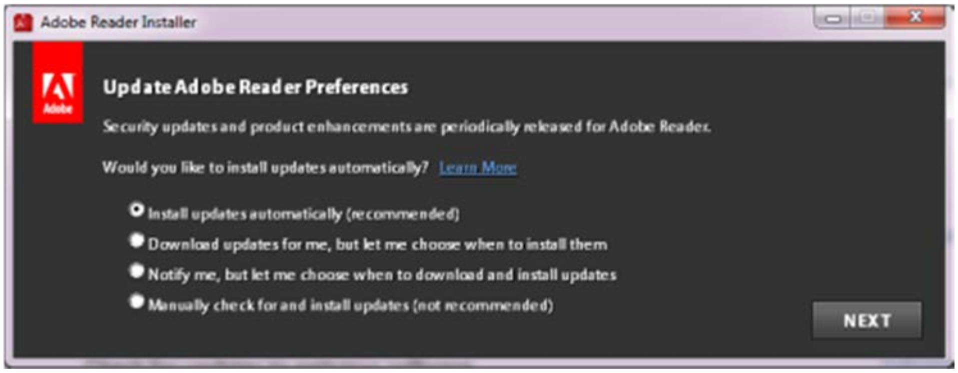
1. Close all versions of Adobe Reader. Close any browser that is displaying a pdf file.
2. On the Adobe Reader Download page at www.adobe.com, click **Install Now**.

   Note: To install an older version of Adobe Reader, go to the Adobe Reader archive page.

3. When the “File Download - Security Warning” dialog box appears, click **Run**.

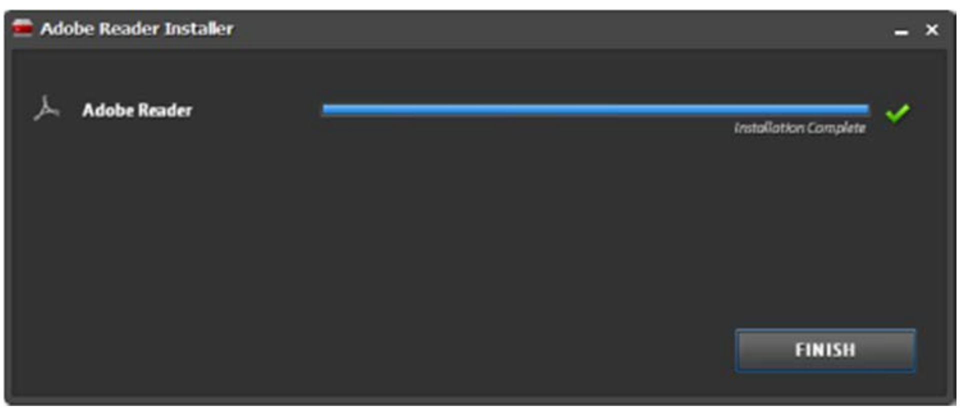
4. When the “Internet Explorer - Security Warning” dialog box appears, click **Run**.

5. If prompted to update Adobe Reader preferences, select an update preference, then click **Next**.



Note: Adobe Reader installation is a two-part process: The installer is downloaded, and then Adobe Reader is installed. Be sure to wait until <u>both parts</u> are complete. A progress bar displays the time remaining.

6. When you see the confirmation message that the installation is complete, click **Finish**.



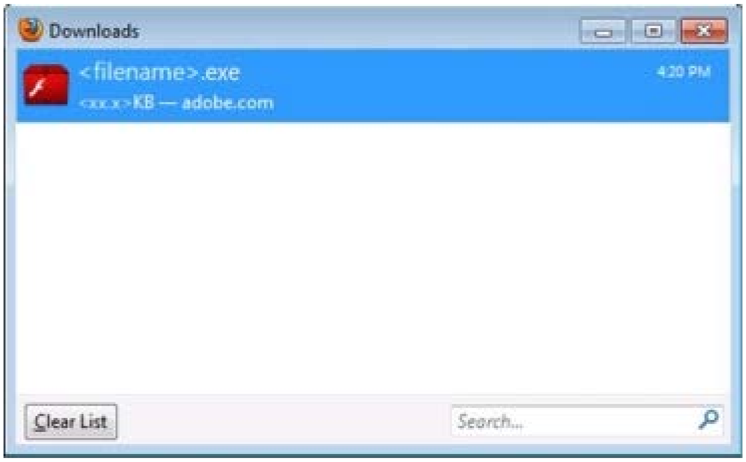
Mozilla Firefox: Download and Install Adobe Reader

Follow these steps to install Adobe Reader using Mozilla Firefox.

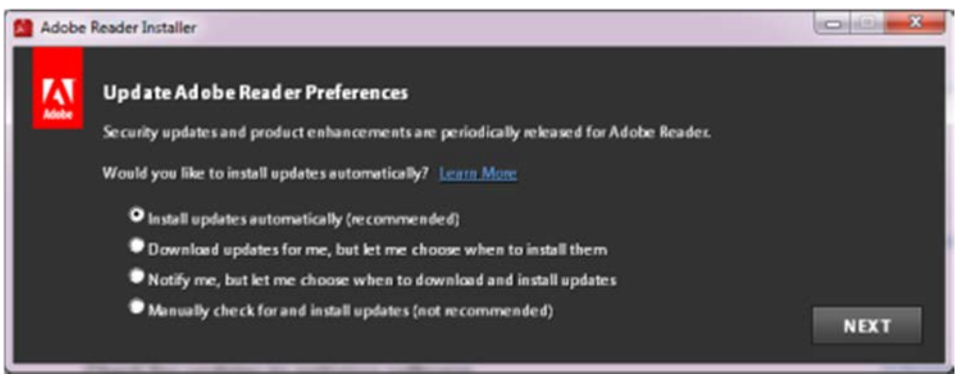
1. Close all versions of Adobe Reader. Close any browser that is displaying a pdf file.
2. On the Adobe Reader Download page, click **Install Now**.
3. When the "Opening" dialog box appears, click **Save File**.

4. When the “Downloads” window appears, double-click the “.exe” file for Adobe Reader.

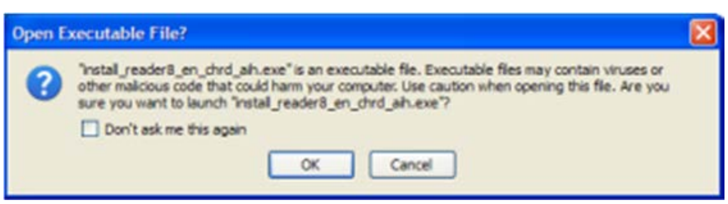
   Note: If you don't see the “Downloads” window, other applications or windows could be hiding it. In Firefox, choose **Tools > Downloads**.



5. If prompted to update Adobe Reader preferences, select an update preference, then click **Next**.

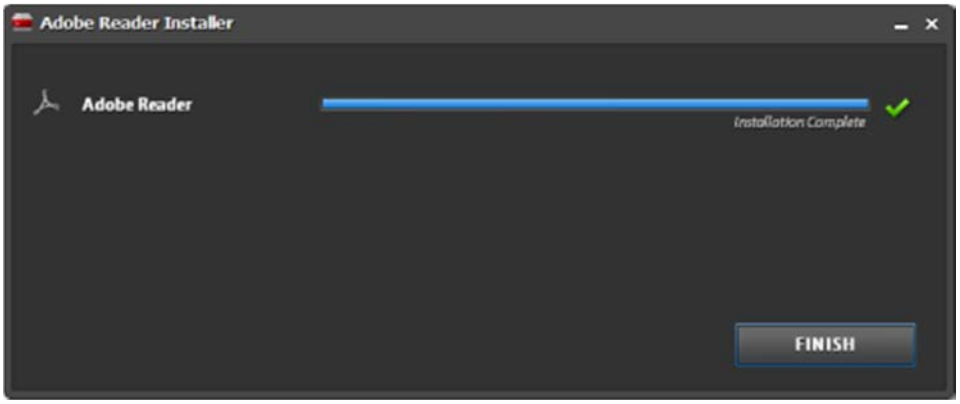


6. If prompted to open the executable file, click **OK**.



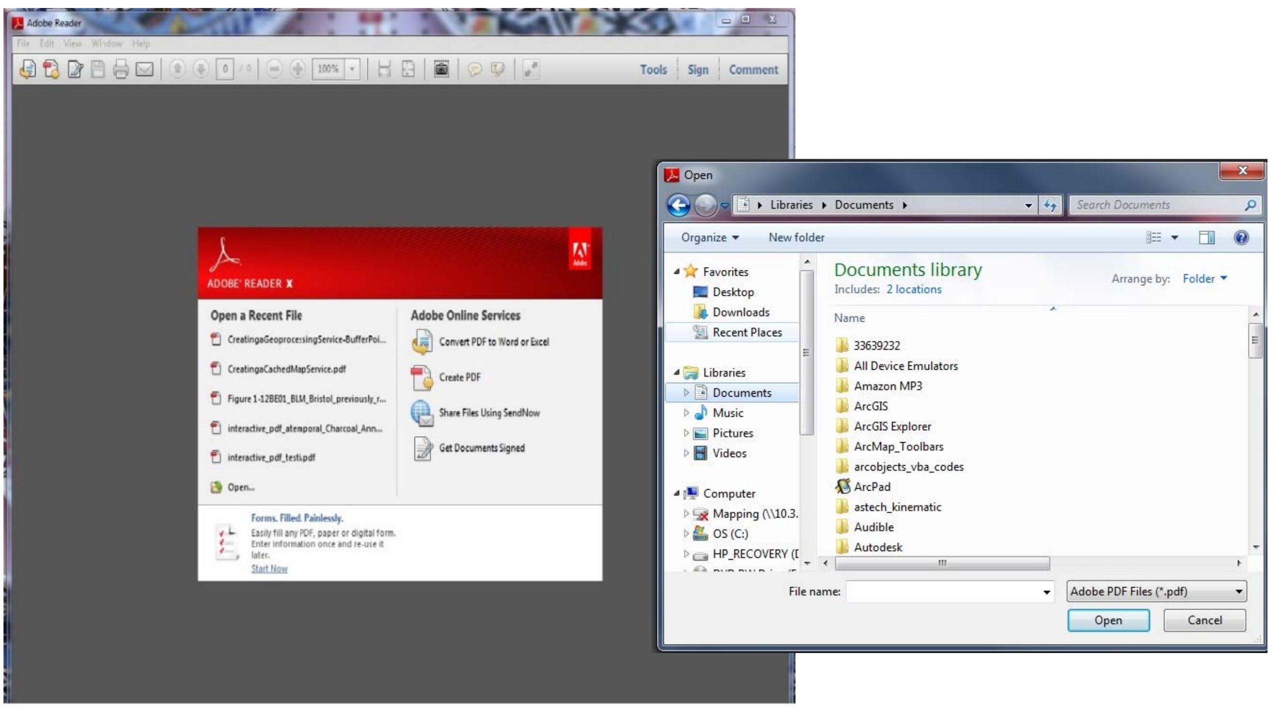
Note: Adobe Reader installation is a two-part process: The installer is downloaded, and then Adobe Reader is installed. Be sure to wait until both parts are complete. A progress bar displays the time remaining.

When you see the confirmation message that the installation is complete, click **Finish**.



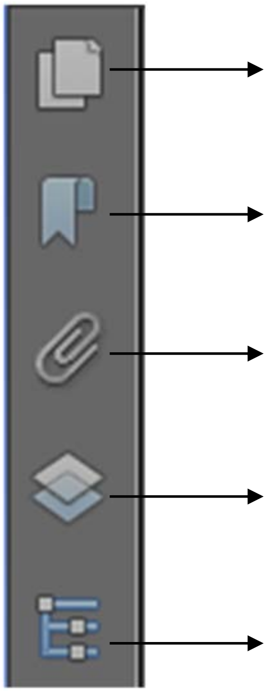
Opening PDF Files

After installing Adobe Reader, navigate to the pdf file's location, and double-click to open it. Alternatively, you can start Adobe Acrobat and click **Open** on the main screen.



A file browser window will come up, and from there, you can navigate to the pdf file's location.

The Navigation Panes



Page Thumbnail pane: This pane shows thumbnails of the pages of the active pdf document and allows you to do page-level operations while looking at the previews, such as viewing the pages in two windows.

Bookmark pane: A bookmark is a type of link with representative text that appears in the “Bookmarks” panel in the navigation pane. Each bookmark goes to a different view or page in the document.

Attachment pane: This pane is used to view the pdf attachments. It has no functionality in the pdf.

Layers pane: This pane is used to control the layers of the pdf document. For a detailed discussion, see the “PDF Layers” section of this guide.

Model Tree pane: This pane shows the attribute data for certain layers. For a detailed discussion, see the “Model Tree” section of this guide.

Show or Hide the Navigation Pane

The navigation pane is an area of the workspace that can display different navigation panels. Various functional tools can appear in the navigation pane. For example, the “Page Thumbnails” panel contains thumbnail images of each page; clicking a thumbnail image of a page opens that page in the document. When you open a pdf file, the navigation pane is closed by default, but buttons along the left side of the work area provide easy access to various panels, such as the “Page Thumbnails” button () and the “Bookmarks” panel button (). When Adobe Acrobat is open but empty (no pdf file is open), the navigation pane is unavailable.

1. To open the navigation pane, do one of the following:
   - Choose **View > Show/Hide > Navigation Panes > Show Navigation Pane**.
   - Click any panel button on the left side of the work area to open that panel.

2. To close the navigation pane, do one of the following:
   - Choose **View > Show/Hide > Navigation Panes > Hide Navigation Pane**.
   - Click the button for the currently open panel in the navigation pane.

Note: The creator of the pdf file can control the contents of some navigation panels and may opt to make them empty.

Change the Display Area for Navigation Panels

All navigation panels, such as Bookmarks, appear in a column on the left side of the work area.

- To change the width of the navigation pane, drag its right border.

- To view a different panel, select the button for the panel, which will be visible on the left side of the navigation pane.

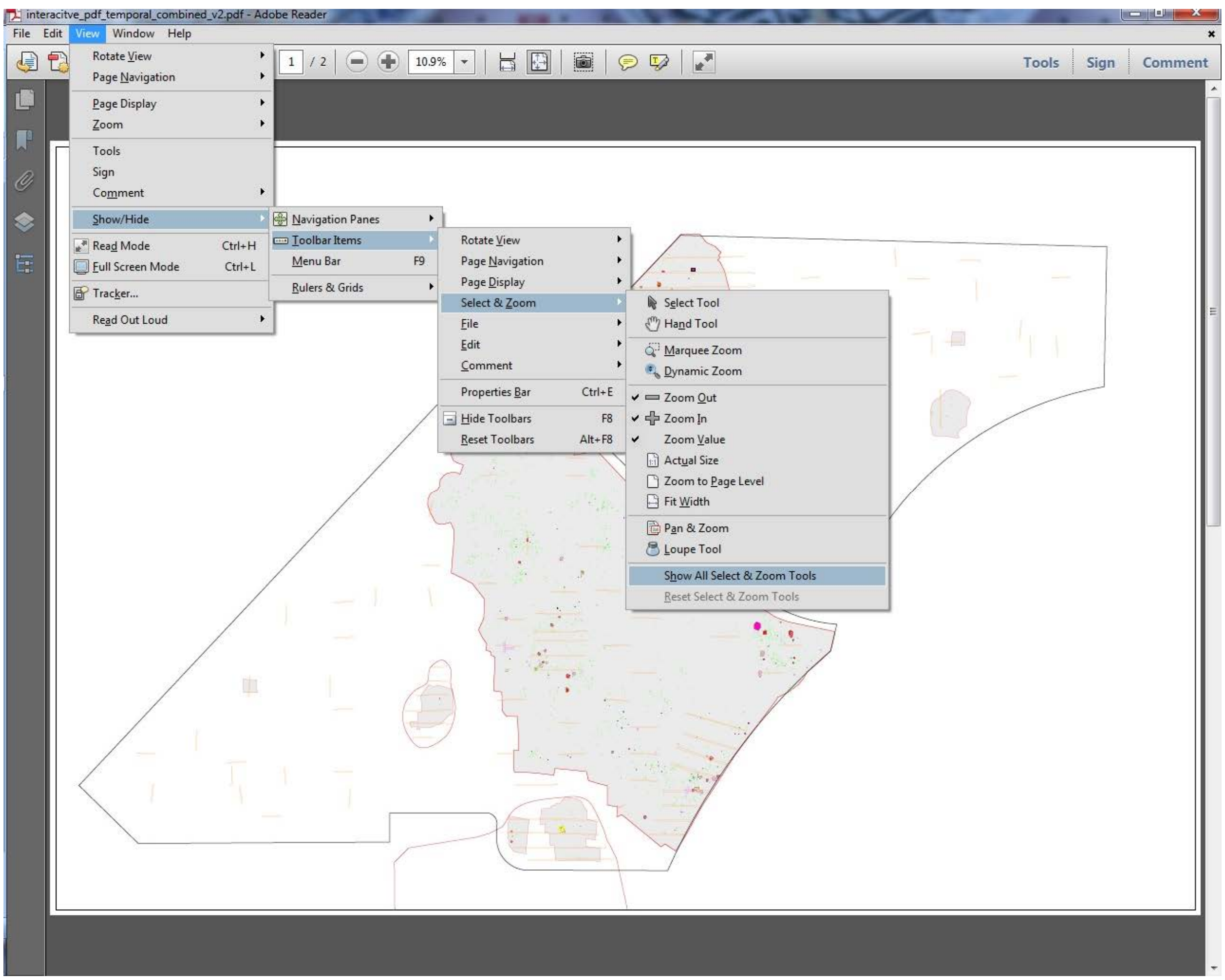
Options in a Navigation Panel

All navigation panels have an options menu ( ) in the upper-left corner. The commands available in these menus vary. Some panels also contain other buttons that affect the items in the panel. Again, these vary among the different panels, and some panels have none.

View and Navigate PDF Files

To place the “Select & Zoom” toolbar on the main toolbar:

- Go to the **View** menu, and expand it.
- Expand **Show/Hide**.
- Expand **Toolbar Items**.
- Click **Show all Select & Zoom Tools**.



The toolbar should look like the above.

Adjust Page Magnification

Tools on the “Select & Zoom” toolbar can change the magnification of a pdf document. Only some of these tools appear in the default view of the toolbar. You can see all the tools by right-clicking the “Select & Zoom” toolbar and then choosing individual tools or clicking **Show All Select & Zoom Tools**.

All Zoom tools

A. Marquee Zoom tool **B.** Continuous Zoom tool **C.** Zoom Out button **D.** Zoom In button **E.** Zoom Value menu button **F.** Actual Size button **G.** Fit Width button **H.** Zoom to Page Level button **I.** Pan & Zoom tool **J.** Loupe Tool

- **A.** The **Marquee Zoom** tool works in a few different ways. Once it is selected, you can use the magnifying glass to zoom in by left-clicking and dragging a rectangle around the portion of the map that you would like to zoom in on. Or you can simply place the magnifying glass over the portion of the map you would like magnified and left-click your mouse. This increases the magnification by one preset level, centering on the point where you clicked. To decrease the magnification by one preset level, Ctrl-click the map when the “Marquee Zoom” tool is selected.
- **B.** Once it is selected, the **Continuous Zoom** or **Dynamic** tool zooms in when you left-click and drag it up the map. Alternatively, it zooms out when you left-click and drag down. If you use a mouse wheel, this tool zooms in when you roll forward and zooms out when you roll backward.
- **C. and D**. Upon selecting the **Zoom Out** or **Zoom In** button, the map will decrease or increase in magnification by preset levels.
- **E.** The **Zoom Value** option changes the page view according to a percentage you type in or select from a pop-up menu.
- **F.** Upon selecting **Actual Size,** the page will be displayed at 100% magnification.
- **G.** Upon selecting **Fit Width,** the magnification will be adjusted so that the document fills the document pane horizontally.
- **H.** Selecting **Zoom to Page Level** adjusts the magnification so that one page fills the document pane vertically.
- **I.** Selecting the **Pan & Zoom** tool adjusts the magnification and position of the view area to match the area in an adjustable rectangle in the “Pan & Zoom” window’s thumbnail view of the page.
- **J.** Selecting the **Loupe Tool** and left-clicking your mouse on the map will open a small window that displays a magnified portion of the document. The magnified portion is indicated by a rectangle that is displayed on the map. The size of this rectangle can be adjusted by placing the cursor on the corner of the rectangle, left-clicking your mouse, and dragging the corner of the rectangle to the desired size. The location of the rectangle can also be moved by placing the cursor inside the rectangle, left-clicking your mouse, and dragging the rectangle to the desired location.

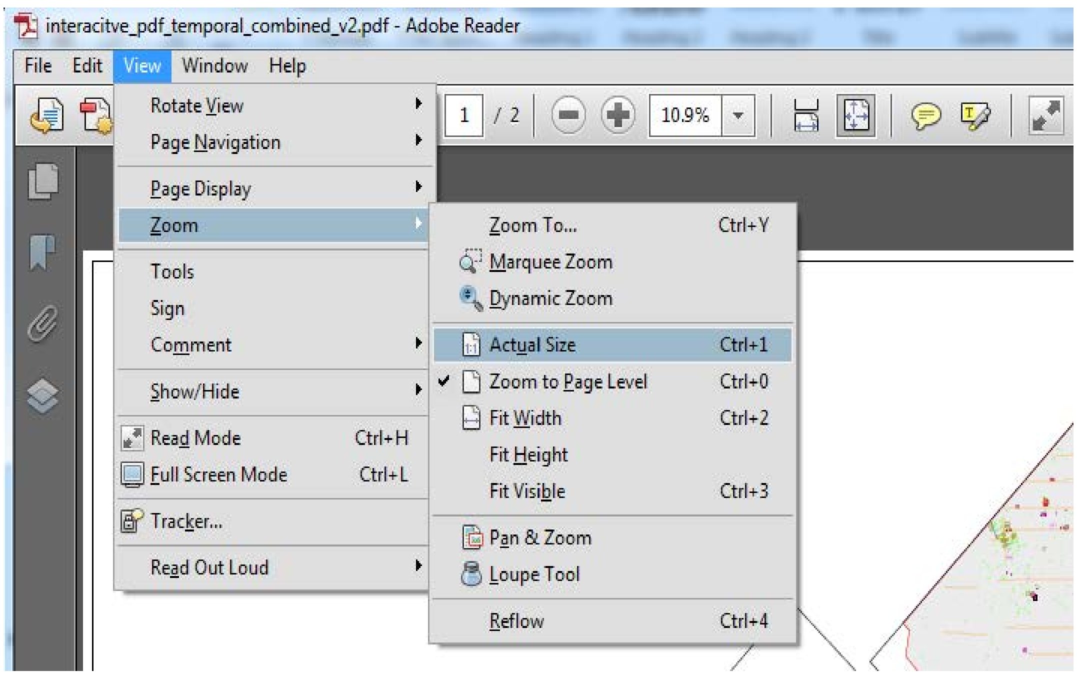
Resize a Page to Fit the Window

- To resize the page to fit entirely in the document pane, choose **View > Zoom > Zoom to Page Level**.
- To resize the page to fit the width of the window, choose **View > Zoom > Fit Width**. Part of the page may be out of view.
- To resize the page to fit the height of the window, choose **View > Zoom > Fit Height**. Part of the page may be out of view.
- To resize the page so that its text and images fit the width of the window, choose **View > Zoom > Fit Visible**. Part of the page may be out of view.

To see keyboard shortcuts for resizing the document, open the "View" menu and click **Zoom**.

Show a Page at Actual Size

- Choose **View > Zoom > Actual Size**.



The actual size of a pdf page is typically 100%, but a document may be set to another magnification level by the user who created it.

Change the Magnification with Zoom Tools

- Do one of the following:
  - Click the **Zoom In** button ( ) or the **Zoom Out** button ( ) in the toolbar.
  - Enter a magnification percentage in the "Common Tools" toolbar, either by typing it in or by choosing it from the pop-up menu.
  - Drag the "Marquee Zoom" tool ( ) to define the area of the page that you want to fill the document pane (**View > Zoom > Marquee Zoom**).

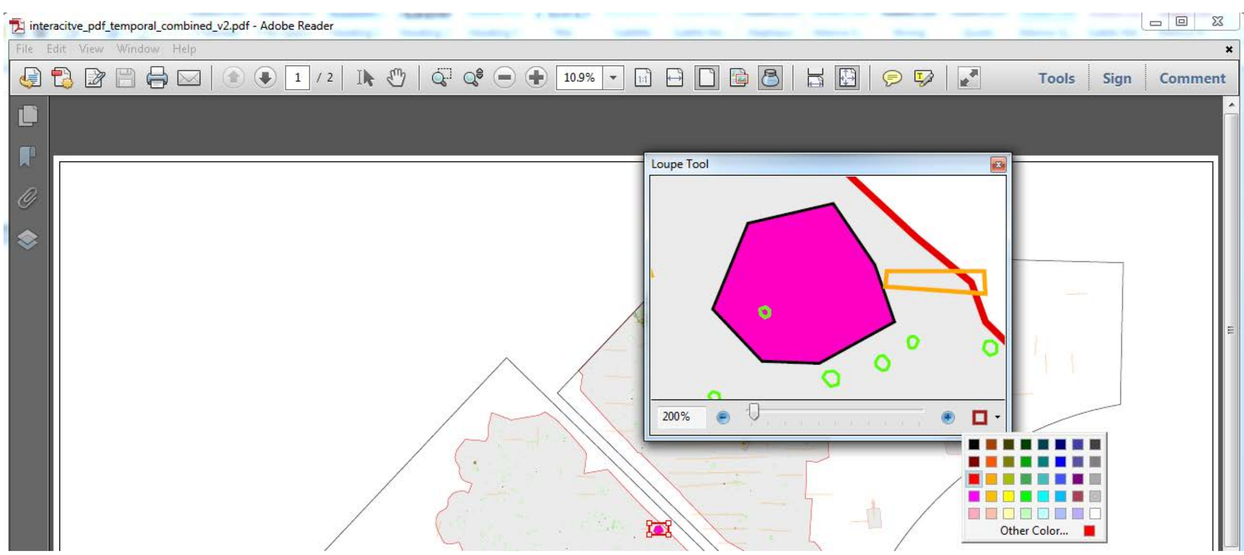
- o Drag the “Continuous Zoom” tool, also called “Dynamic Zoom” (), upward to increase the magnification or downward to decrease magnification (**View > Show/Hide > Toolbar Items > Select & Zoom > Dynamic Zoom**).
- When the “Marquee Zoom” tool is selected, you can Ctrl-click or Ctrl-drag to zoom out. Holding down the Shift key allows you to switch temporarily from the “Marquee Zoom” tool to the “Dynamic Zoom” tool.

Change the Magnification with the Pan & Zoom Window Tool

1. Choose **View > Zoom > Pan & Zoom**, or click the “Pan & Zoom” tool () in the “Common Tools” toolbar.
2. Do any of the following:
   - o Drag the handles of the box in the “Pan & Zoom” window to change the document magnification.
   - o Drag the center of the box to pan across the area you want to see.
   - o Click the navigation buttons to move to a different page.
   - o Enter a value in the zoom text box, or click the Plus () or Minus () button to increase or decrease the magnification by preset levels.

Change the Magnification with the Loupe Tool

1. Choose **View > Zoom > Loupe Tool**.
2. Click the area of the document you want to view in closer detail. A rectangle appears in the document, corresponding to the area shown in the “Loupe Tool” window. You can drag or resize the rectangle to change the “Loupe Tool” view.
3. To change the magnification of the Loupe Tool, do any of the following:
   - o Drag the slider.
   - o Click the Plus or Minus button.
   - o Enter a value in the zoom text box.

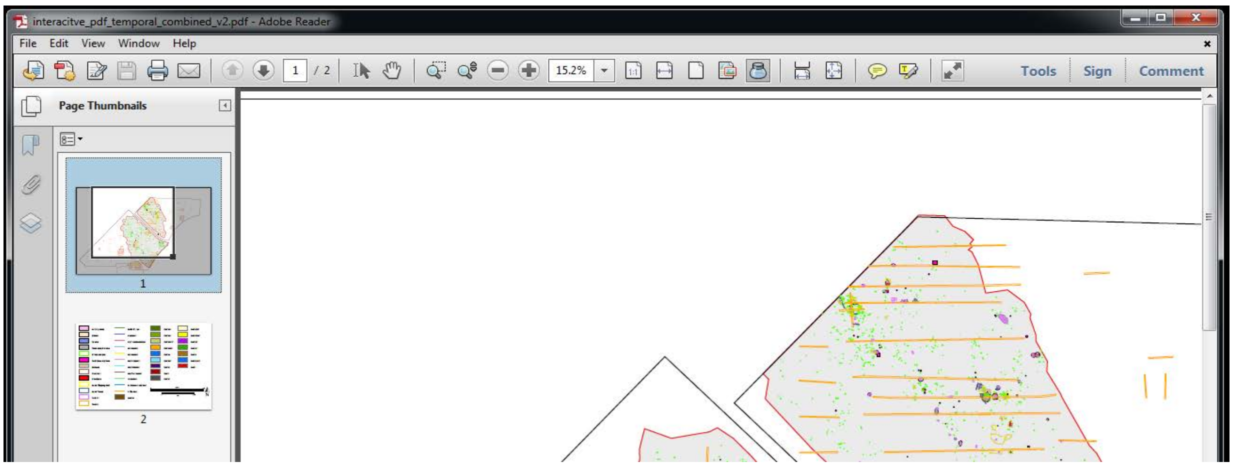


Use the Loupe Tool to view a magnified area of the document.

4. You can change the color of the “Loupe Tool” rectangle. Click the “Line Color” pop-up menu in the lower-right corner of the “Loupe Tool” window, and select a new color.

Change the Magnification by Using a Page Thumbnail

1. Click the “Page Thumbnails” button () in the navigation pane on the left side of the window.
2. Locate the thumbnail for the page, and position the pointer over the lower-right corner of the page-view box until the pointer changes into a double-headed arrow.
3. Drag the corner of the box to reduce or expand the view of the page.
4. As needed, move the pointer over the zoom box frame within the thumbnail until it changes into a Hand icon. Then drag the frame to see a different area of the page in the document pane.



A page-view box in a page thumbnail indicates the area of the page currently showing in the document pane.

Change the Default Magnification

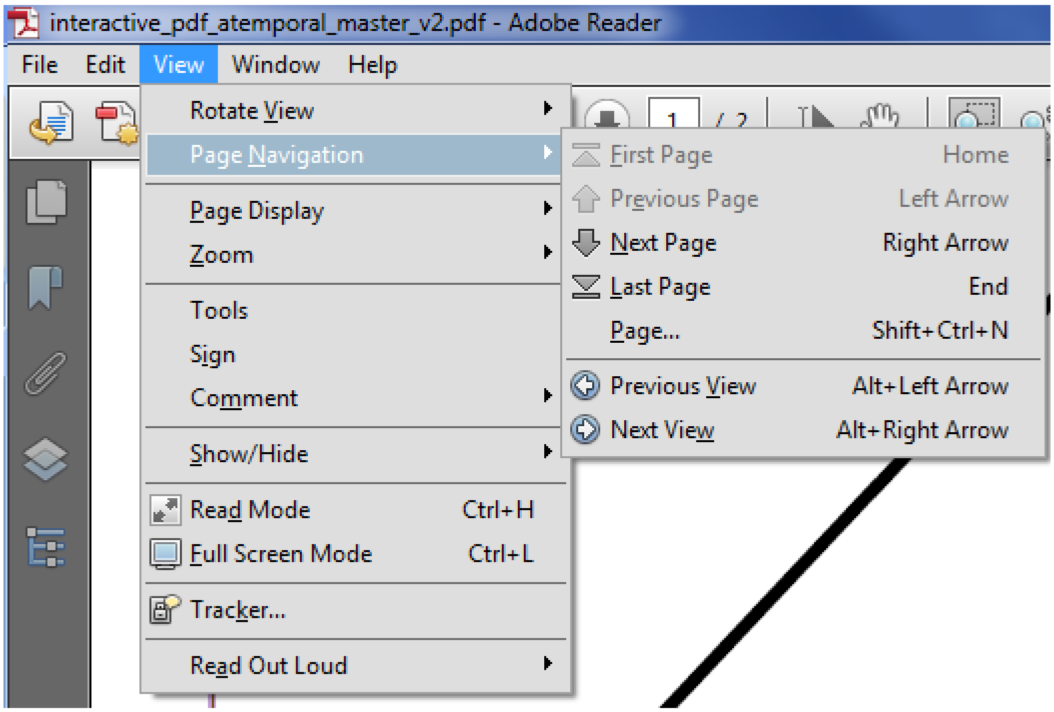
1. Go to **View** > **Zoom** > **Zoom To.**
2. The **Zoom To** window will pop up, and you can choose a default magnification level.

Retrace Your Viewing Path

You can find pdf pages that you viewed earlier by retracing your viewing path. It’s helpful to understand the difference between previous and next *pages* and previous and next *views*. For pages, “previous” and “next” refer to the two adjacent pages, before and after the currently active page. For views, “previous” and “next” refer to your viewing history. For example, if you jump forward and backward in a document, your viewing history retraces those steps, showing you the pages you viewed in the reverse order in which you viewed them.

- Choose **View > Page Navigation > Previous View**. Alternatively, you can use the key combination of **Alt + Left Arrow**.
- To continue viewing another part of your path, do either of the following:
    - o Repeat the first step above.
    - o Choose **View > Page Navigation > Next View**. Alternatively, you can use the key combination of **Alt + Right Arrow**.

Note: You can make the “Previous View” button ( ) and “Next View” button ( ) available in the toolbar area by right-clicking the “Page Navigation” toolbar and choosing them from the context menu or by choosing **Show All Tools**.



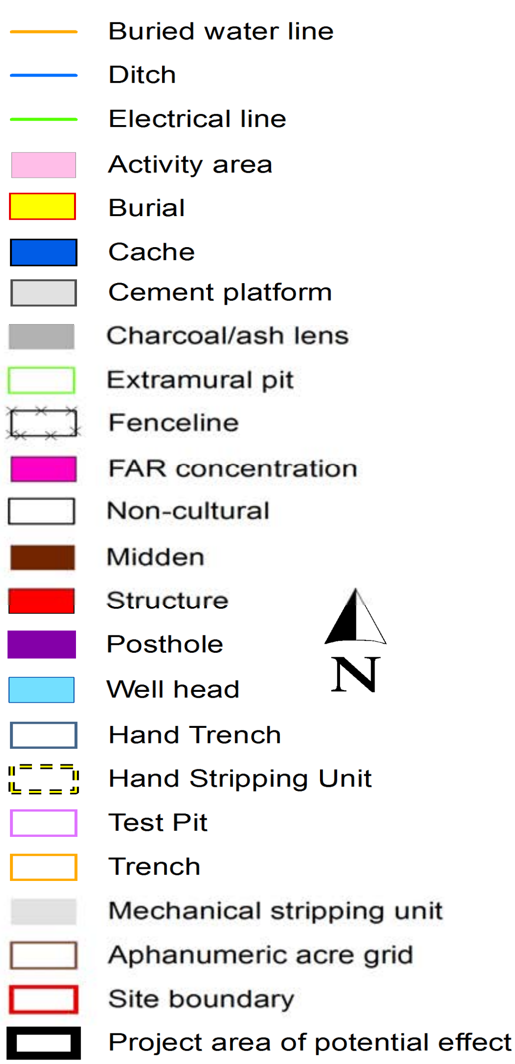
Display Off-Screen Areas of a Magnified Page

When you zoom to a high magnification, you may be able to see only part of a page. You can shift the view to show other areas of the page without changing the magnification level.

- Do either of the following:
    - o Use the vertical scroll bars to move up and down the pages or the horizontal scroll bars to move across the page.
    - o Select the Hand tool in the “Common Tools” toolbar, and drag to move the page, as though you were sliding a piece of paper on the surface of a table.

Legend

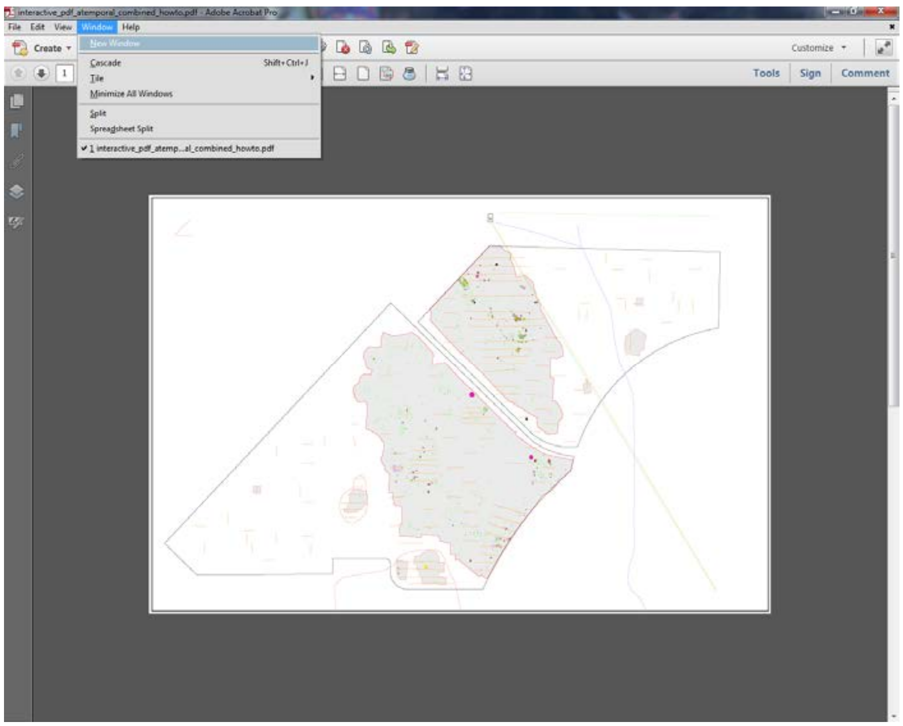
To facilitate ease of use, the legend has been placed on the second page of this pdf file. You can use a multiple-windows view to display both the legend and the map while you zoom into sections of the map.



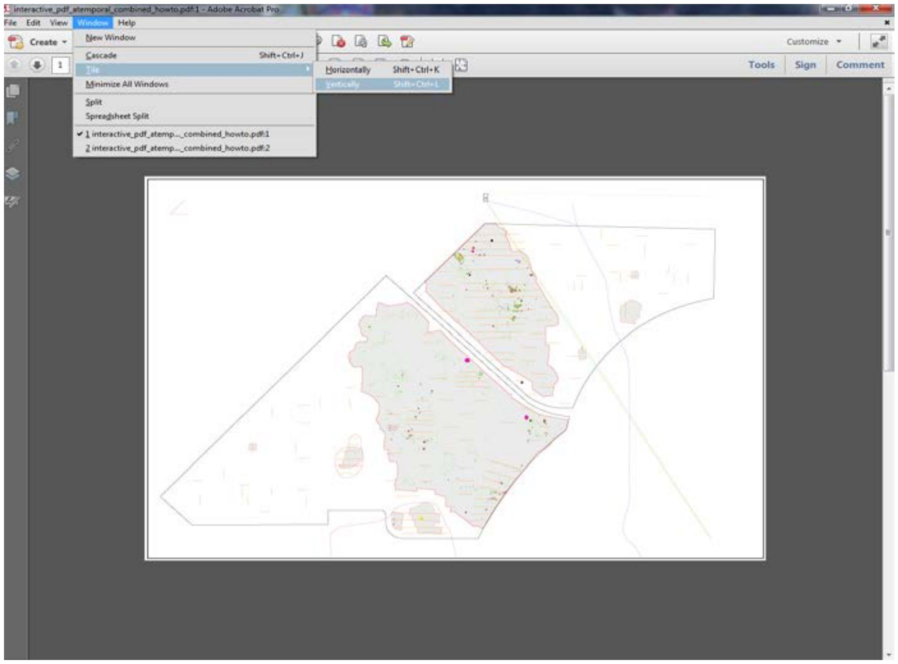
View a Document in Tiled Windows

You can create multiple windows for the same document using the “New Window” command. New windows will have the same size, magnification, and layout as the original window and will open to the same page and on top of the original window. When you open a new window, Adobe Acrobat adds the suffix “1” to the original file name and assigns the suffix “2” to the new window. You can open multiple windows, and the suffix numbers will increase incrementally with each new window.

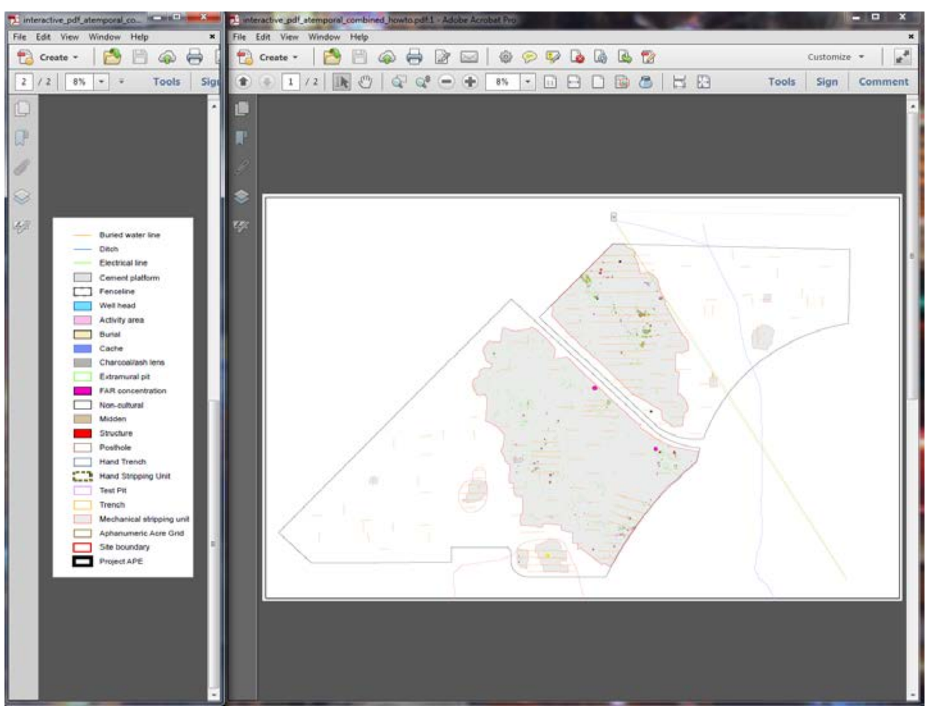
1. Go to “Window” menu, drop it down, and click **New Window**.



2. After the new window opens, you can display the two windows side-by-side. Go to the “Window” menu again, click **Tile**, and then click **Vertically**.



3. At the second window, go to the second page by using the down arrow on your keyboard, so that both the legend and the map can be displayed at the same time. You can also adjust your window sizes.



Vertically tiled windows display both the legend and the map.

Note: This feature is not available when pdf files are viewed in a browser.

Close a Window

- Click the “Close” box in the window. You will be prompted to save any changes. Closing a window does not close a document if more than one window is open.

Close All Windows for a Document

- Choose **File > Close**. You will be prompted to save any changes before each window is closed.

PDF Layers

You can view, navigate, and print layered content in pdf files created from applications such as InDesign, AutoCAD, and ArcGIS.

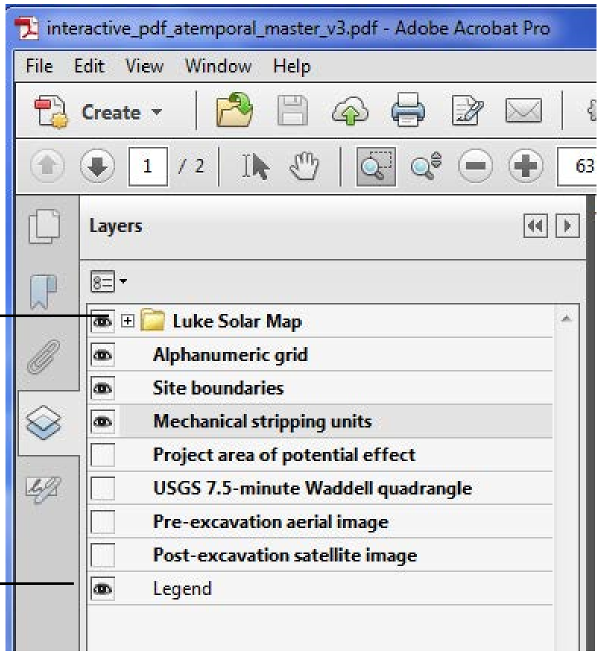
> ***Important Note:*** The layers in this pdf file are organized by their drawing order. Unfortunately, there is no way to list them alphabetically and still retain their drawing order.

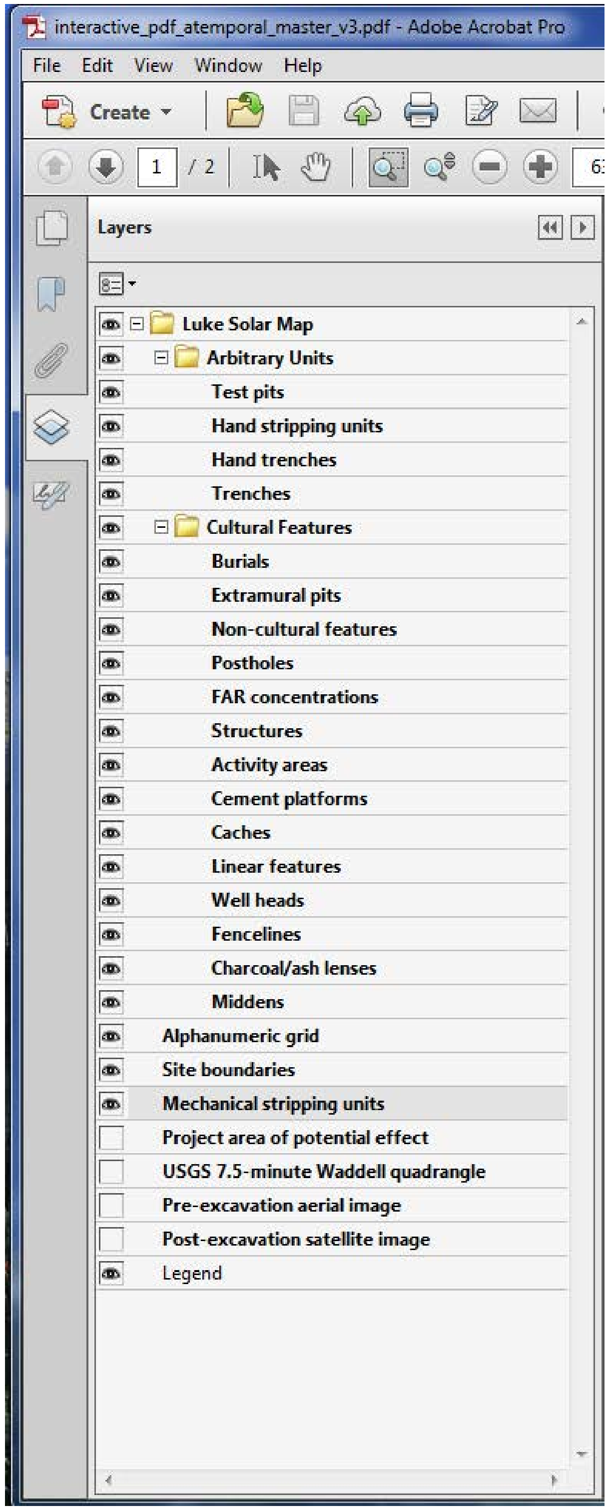
Show or Hide Layers

Information can be stored in different layers of a pdf file. The layers that appear in the pdf file are based on the layers created in the original application. Use the “Layers” panel to examine layers and show or hide the content associated with each layer. Items in locked layers cannot be hidden. Some layers may be organized into nested groups with a parent layer. Other layers may be in groups with no parent layer.

Plus icon indicates a group of nested layers.

Eye icon indicates a displayed layer



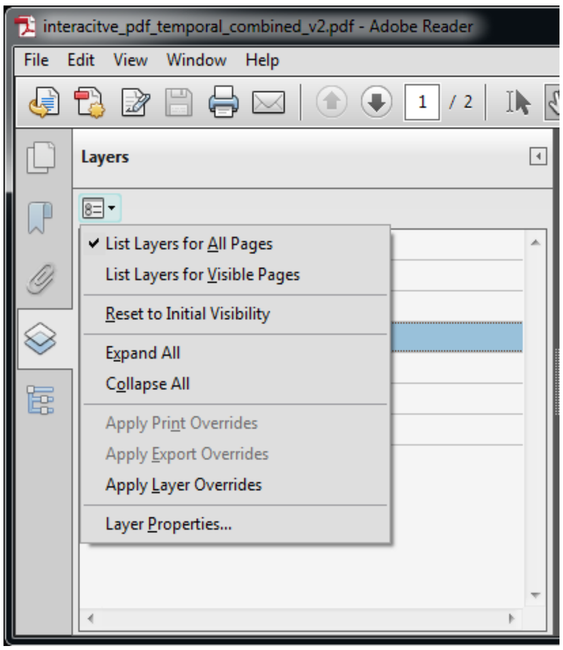


Layers panel showing all the layers expanded in the pdf file

1. Choose **View > Show/Hide > Navigation Panes > Layers**.
2. To hide a layer, click the Eye icon. To show a hidden layer, click the empty box. (A layer is visible when the Eye icon is present and hidden when the Eye icon is absent. This setting temporarily overrides the settings in the "Layer Properties" dialog box.)

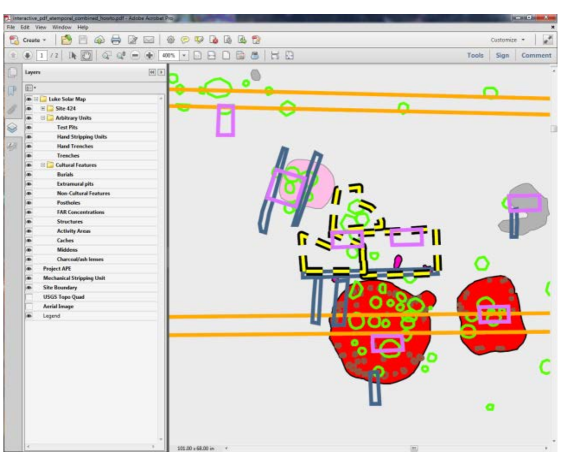
   Note: In a nested layer group, if the parent layer is hidden, the nested layers are automatically hidden, as well. If the parent layer is visible, nested layers can be made visible or can be hidden.

3. From the "Options" menu ( ), you can choose one of the following:

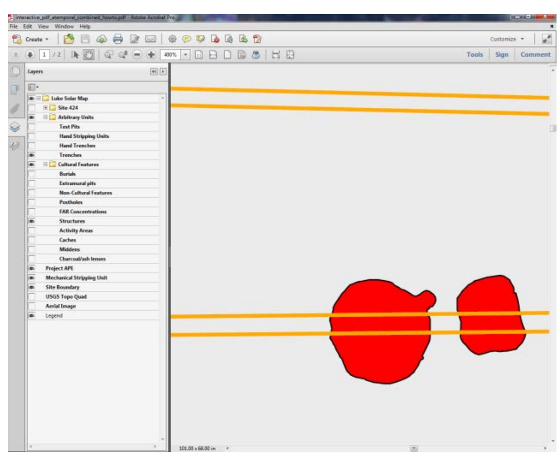


- **List Layers for All Pages**: Shows every layer across every page of the document.
- **List Layers for Visible Pages**: Shows layers only on the currently visible pages.
- **Reset to Initial Visibility**: Resets layers to their default state.
- **Expand All**: Expands all the nested layers.
- **Collapse All**: Collapses all the layers.

4. The layers can be turned on and off in order to display only specific feature types :



All the layers are turned on.

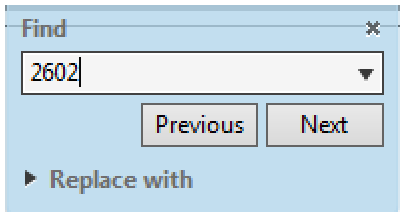


Only structures and trenches are turned on.

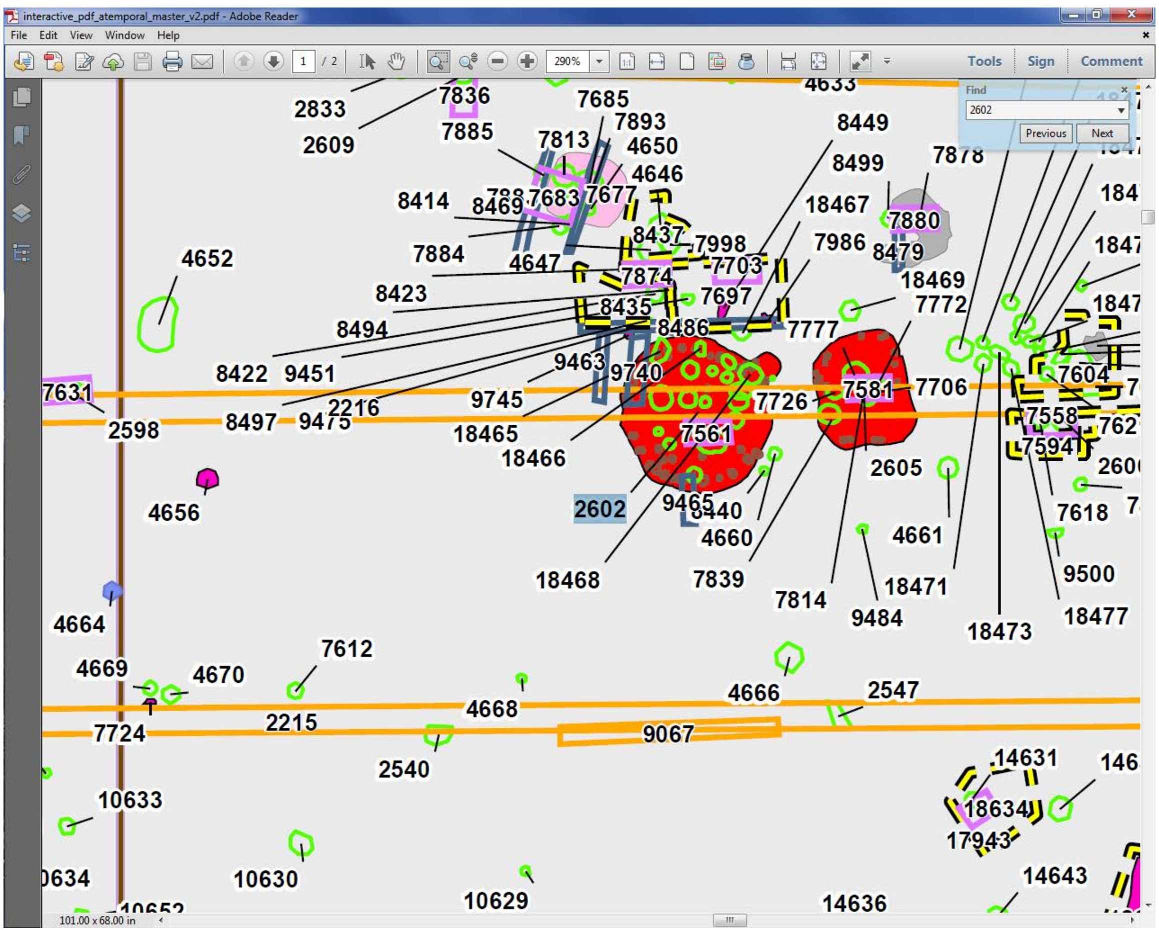
Find a Specific Feature in the PDF Document

To search for a specific feature:

- Right-click the document, and choose **Find** from the pop-up menu, or use the **Ctrl + F** key combination. The "Find" window will pop up in the upper-right corner of your screen. In the upper-right of the window, enter the PD number of the feature you are looking for, and click **Next**.



- A blue rectangle will highlight the area where the feature is located. If you hover the mouse on the rectangle and left-click, it will zoom in on the highlighted area.
- When you zoom in, the PD number that you searched for will be highlighted, as well.



- If you want go back to the previous view, just use the key combination of **Alt + Left Arrow**.

Measuring Features in the PDF Document

This pdf file is geospatially enabled. When you open a geospatially enabled pdf file, you can find locations, measure distances, and add location markers. You can also copy coordinates to the clipboard for use with a Web mapping service.

Use the "Geospatial Location" tool to perform these tasks:

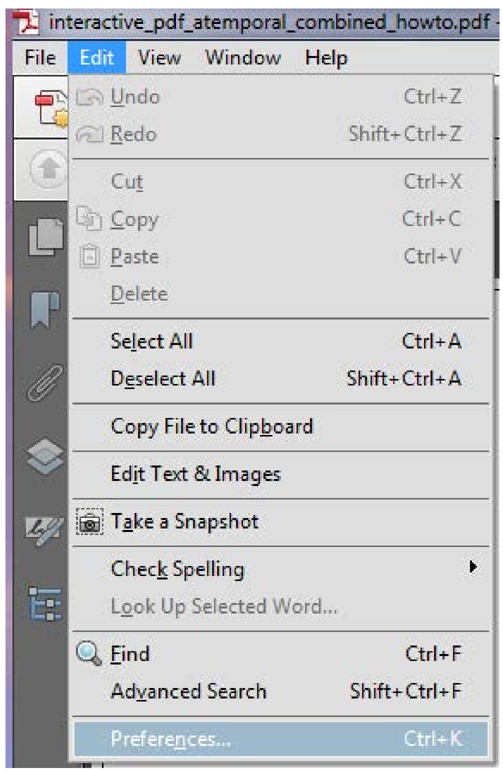
- View latitude and longitude while the cursor is over an area containing geospatial information.
- Mark a location with a geospatial annotation.
- Search for a location in a document.

Change Measurement Units within a Document

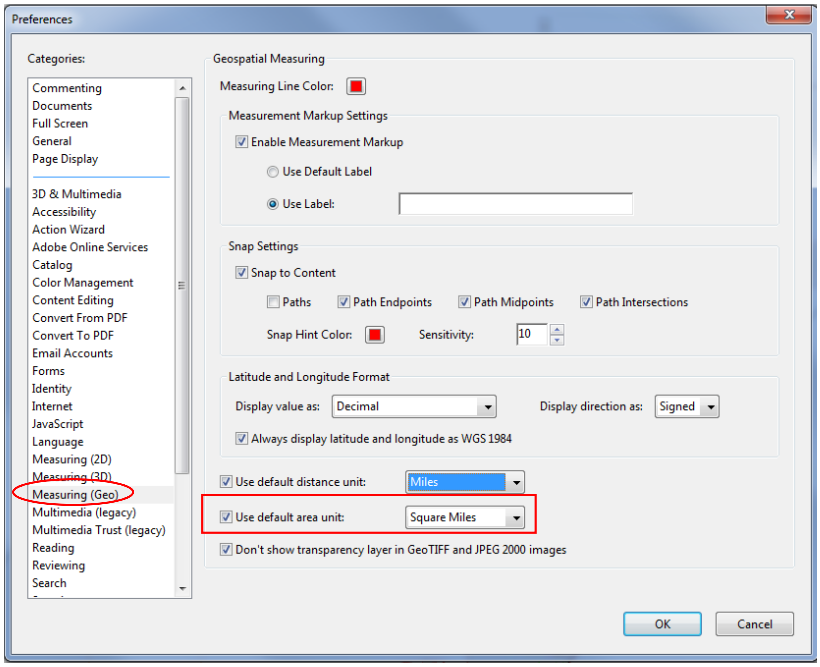
When you open the pdf file, the default measurement unit is miles. To change the measurement unit to meters:

- Click the **Edit** menu to drop it down.

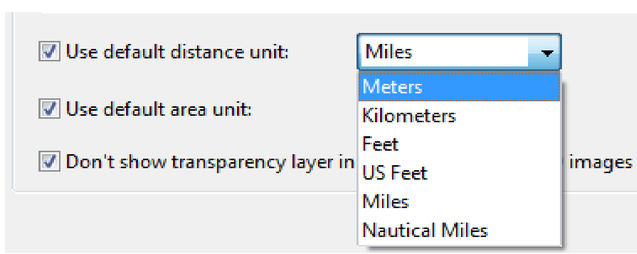
- Choose **Preferences**.



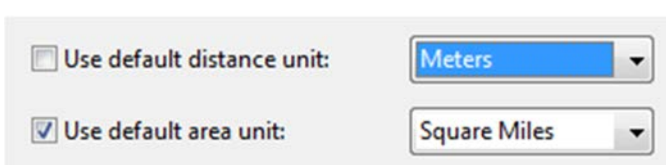
- The “Preferences” window will come up, and the preferences categories are listed in the left pane.
- Click **Measuring (Geo)**, and the “Geospatial Measuring” preferences will be displayed in the right pane.

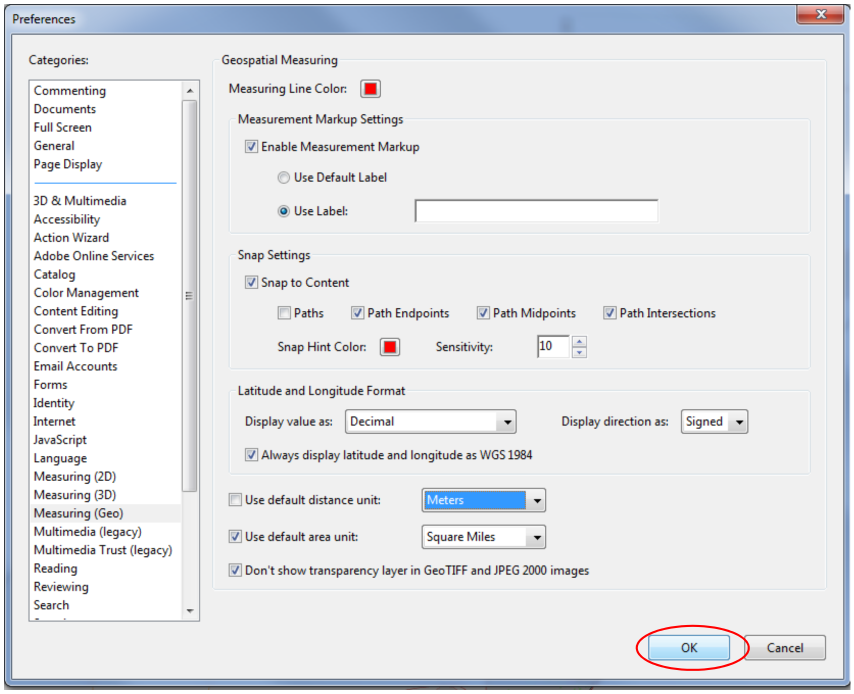


- You will see that the default measurement unit is Miles. To change it to Meters, click the down arrow on the drop-down box, and select Meters.

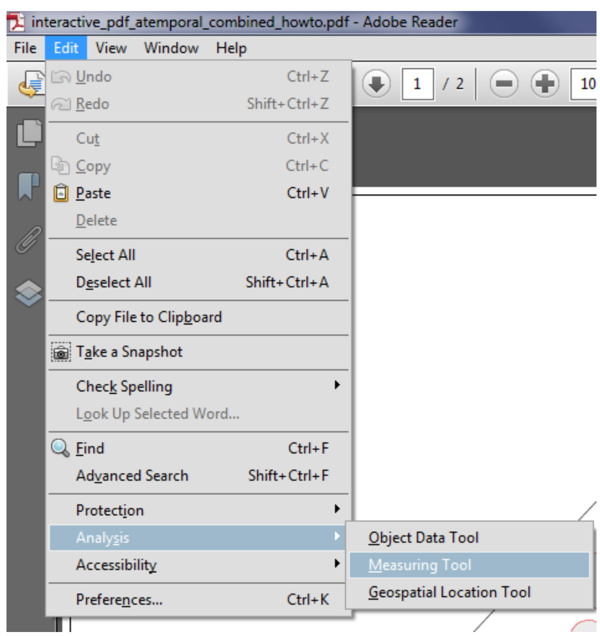


- Also, deselect the “Use default distance unit:” checkbox by clicking on it.

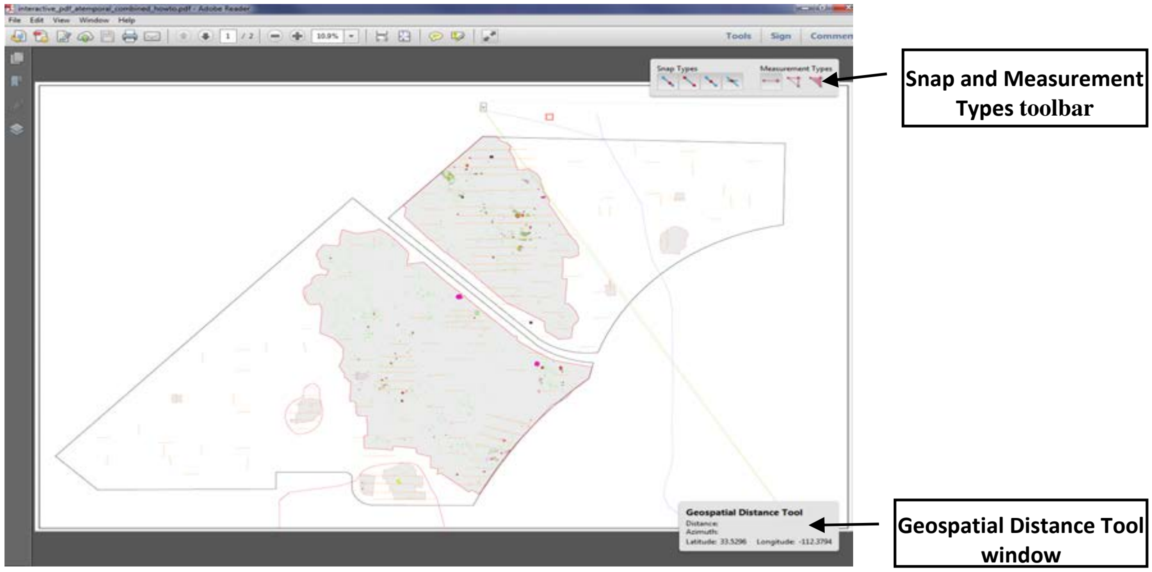




- Click **OK** to exit and save your preferences.
- Choose **Edit** > **Analysis** > **Measuring Tool**.



When you open a geospatial pdf file, the Adobe Acrobat measuring tools read the geospatial information and measure distance and area, instead of page or object dimensions. Use the measuring tools to calculate distance, perimeter, and area on any geospatially enabled pdf file. As you move the mouse pointer over content in the document, snap markers are shown to indicate that you are on a path or at a path end point. You can also see the latitude and longitude of your cursor location when the mouse pointer is over geospatial content.



You will see the “Geospatial Distance Tool” window in the bottom-right corner and the “Snap and Measurement Types” toolbar in the upper-right corner.

Measure Distance, Perimeter, and Area on Maps

- In the “Measurement Tool” display, select a measurement type: Distance ( ), Area ( ), or Perimeter ( ).
- Select a snap-to option:
  - Snap to paths ( )
  - Snap to end points ( )
  - Snap to midpoints ( )
  - Snap to intersections ( )
- Do one of the following:
  - If you are using the “Distance” tool, click where you want to start the measurement, and then drag to the end point, and click again. The distance is displayed in the lower-right corner.
  - If you are using the “Perimeter” tool, click the map in one corner of the perimeter, and then drag to each corner. Click at each corner, and then double-click at the end point. The information window displays the perimeter size.
  - If you are using the “Area” tool, click the map at one corner of the area, and then drag to another corner. Click before changing directions. Double-click at the end to display the total area.
- To finish the measurement, right-click, and select **Complete Measurement**. Or you may select **Cancel Measurement**, to cancel.

Find Map Locations

- Open the pdf file, and choose **Edit** > **Analysis** > **Geospatial Location Tool**.
- Right-click inside the map, and then click **Find a Location**.
- Type the latitude and longitude values (degrees, minutes, and seconds or decimal values) in the two text boxes, and click **Find**.
    - If at least one location is available, the location is highlighted with a blue square, and the page is centered on the highlighted location.
- If the pdf file includes more than one map, click the “Next” or “Previous” button to view additional results, if there are any. Multiple locations are available in several situations:
    - When a document contains multiple maps. For example, when using a pdf file that contains a smaller map within a larger map, such as a city map within a map of a state or country. In searching for a location within the smaller map, Adobe Acrobat finds it in both the larger map and the smaller map.
    - When a document contains multiple pages of a map. For example, if the first page is a map of a country, and the second page is a map of a state or city within that country.
- *Optional:* To add a comment (such as a place name or address), click the location marker, and then add the information in the comment box.
- To end the search, right-click inside the map. Then select **Hide Location Search**, to remove the search boxes.

Mark Geospatial Locations

- Open the pdf file, and choose **Edit** > **Analysis** > **Geospatial Location Tool**. Move the mouse pointer over the document to view latitude and longitude values of areas that contain geospatial information. Right-click inside the map, and then do one of the following:
- To find a location, click **Find a Location**. Type the latitude and longitude values, and click **Find**.
- To mark a location with geospatial information, click **Mark Location**.
- *Optional:* To add a comment (such as a place name or address), click the location marker, and then add the information in the comment box.

Copy Location Coordinates to the Clipboard for Use with a Web Mapping Service

After you find a location on the geospatial pdf file, you can copy the coordinates to the clipboard. From the clipboard, you can paste the data into a Web mapping service that reads latitude and longitude coordinates.

1. Choose **Edit** > **Analysis** > **Geospatial Location Tool**.
2. Right-click the location on the map, and choose **Mark Location**.
3. Open the location annotation, and copy the location information.

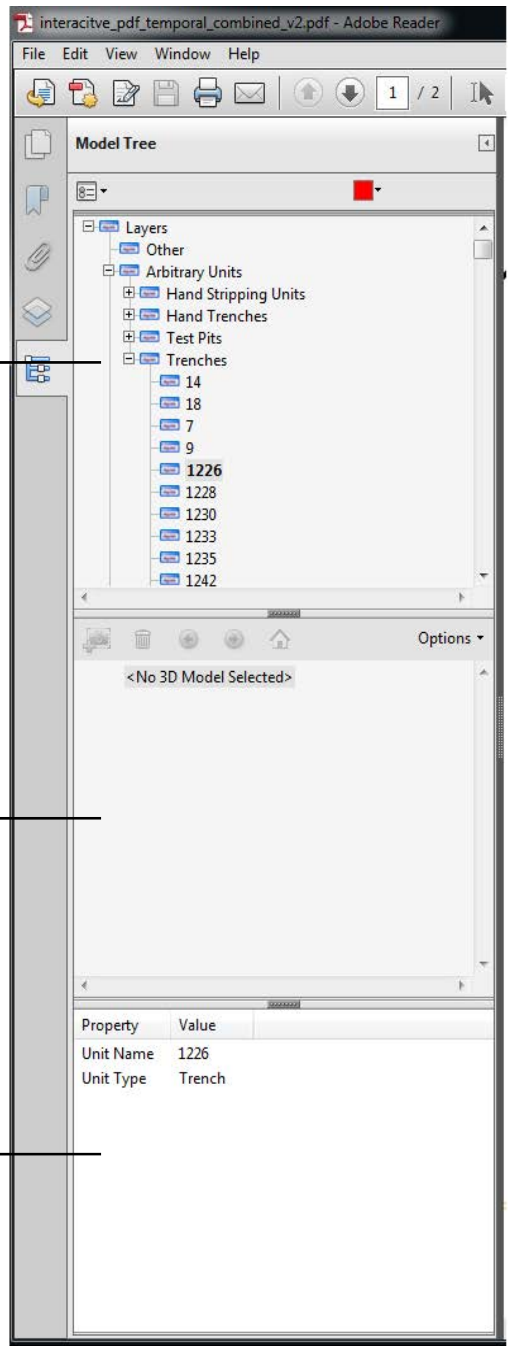
   Note: Adobe Acrobat copies the data in this format: latitude then longitude, separated by a space.

4. Paste the data into the address bar of a Web mapping service that can interpret the location data.

Model Tree

The **Model Tree** appears in the navigation pane on the left side of the work area. You can also open the Model Tree by clicking the “Toggle Model Tree” button ( ) on the 3-D toolbar.

Note: Using the Model Tree requires Adobe Acrobat or Adobe Reader Version 7.0.7 or later. The Model Tree has three panes, each of which displays a specific type of information or controls.

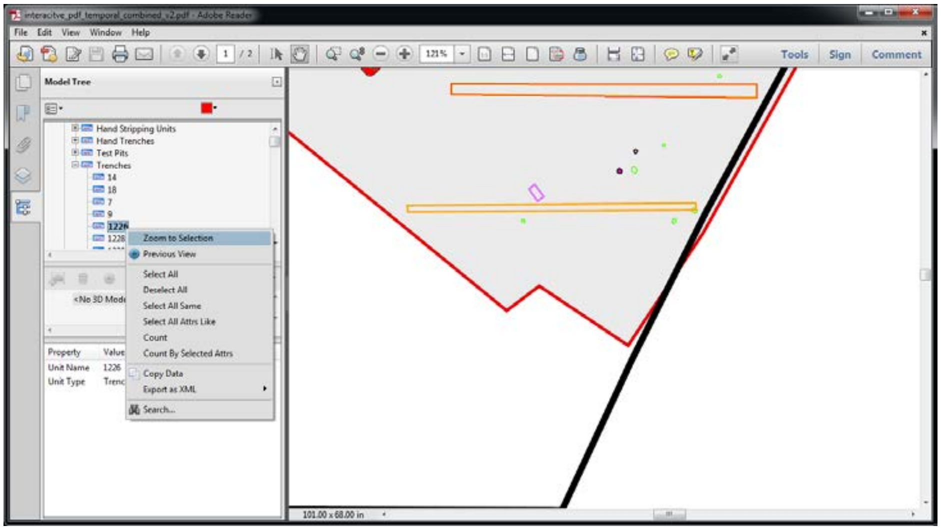


Structure pane: The topmost pane shows the tree structure of the feature layers. Each feature is listed by its PD number.

View pane: The middle pane lists the views that have been defined for the 3-D object. This pane has no functionality in the pdf.

Object Data pane: The lower pane displays attribute information, if there is any, about the selected feature. You cannot edit this information.

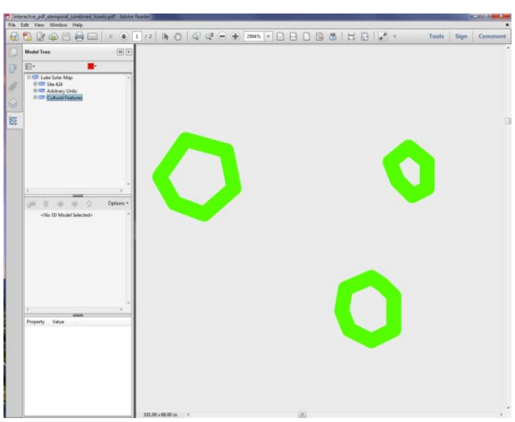
- To zoom to a selected feature from the "Model Tree" pane, right-click the selected feature, and choose **Zoom to Selection**.



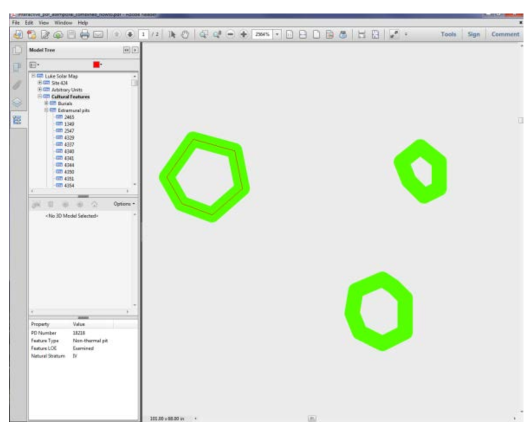
Alternatively, you can choose **Object Data Tool** from the "Analysis" tool set in order to see the feature information in the Model Tree:

- Choose **Edit** > **Analysis** > **Object Data Tool**.
- Zoom in on the area in which you want to identify features.
- Double-click an object on the page to show its information.

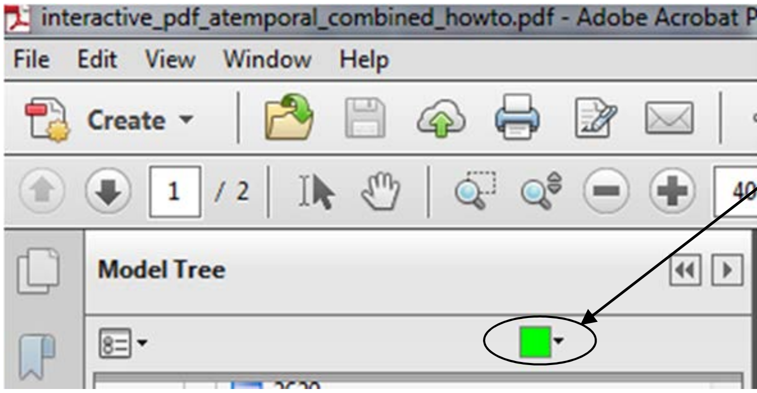
The Model Tree opens and shows a hierarchical list of all structural elements. The selected object's feature information appears as properties and values at the bottom of the Model Tree.



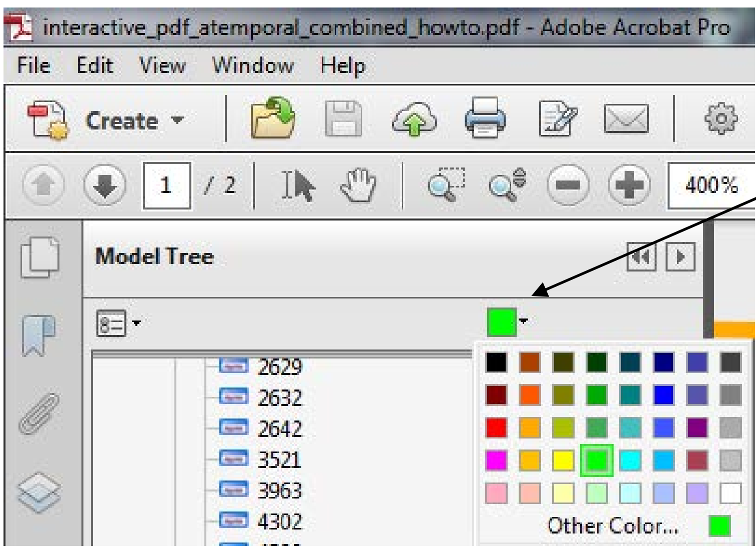
Object Data Tool selected.



Displaying the feature's information using the Object Data Tool.



The selected object is highlighted on the page. The “Highlight Color” menu is at the top of the Model Tree.



By dropping it down, you can choose a different color for the highlighting.

Historical-Period Artifacts

Karen K. Swope

Methods

Historical period artifacts were processed and inventoried in the Statistical Research, Inc. (SRI), laboratory in Tucson, and the analysis was performed in the SRI laboratory in Albuquerque, New Mexico, by Dr. Karen K. Swope. The methods used in the analysis are summarized briefly here. Analytical methods and the attributes recorded were selected based on their potential to address questions about feature chronology, cultural affiliation, and function. Historical period artifacts were sorted into one of four material categories—glass, Historical period ceramic, metal, and Historical period "other"—and were inventoried accordingly. Artifact analysis focused on identifying characteristics that had the potential to inform on each artifact's function, date of manufacture/use, and place of origin. Material class, artifact type, and artifact integrity were recorded using an attribute table that is part of SRI's proprietary database. Each artifact type was selected from an extensive list that included everything from tableware to cans. Artifact dimensions, including rim measurements, were recorded when such information seemed likely to inform on artifact function, date of manufacture/use, and/or origin. Each artifact was assigned to 1 of 26 functional categories used by SRI's Historic Program: agriculture, clothing/clothing maintenance, commerce, communication, construction, food preparation/consumption, food/beverage, food/beverage container, heating/energy, household furnishings, household maintenance, industry, leisure/recreation, lighting, machinery, manufacturing, medical/health, mining/quarrying, mortuary, personal items, religious/ceremony, tools/hardware, transportation, weaponry, other function, or unknown function. These functional categories were used (in combination with other data) to characterize site activities by provenience and period.

Glass artifacts, including bottle and jar fragments and other objects, were examined for color, shape, decoration, finish, technology, size, and makers' marks. Glass-container terminology followed Jones and Sullivan (1985) and Fike (1987). Attributes of ceramic objects were noted, particularly those related to form, body or paste type, glaze, and technology; no ceramic vessels were represented in the collection. Morphology and manufacture techniques for cans were inspected and analyzed. Hardware was described and measured, as appropriate. Because nail shapes and sizes are frequently specific to certain applications, use could be roughly inferred by form. Nail sizes were measured according to pennyweight, which was historically related to the price per hundred but now signifies length (Reader's Digest Association 1973:68–69).

Results

Site 68

A single Historical period artifact was retrieved from the surface of Site 68. A description is provided below.

Household Maintenance

A 1-gallon paint can measuring 7.5 inches in height and $6^5/_8$ inches in diameter was found. It had a wire bail handle attached to convex ears that were soldered to the can body. The can would have been sealed with a multiple-friction lid. This type of paint container was introduced in 1906 (Rock 1987:70) and remains in production today.

Falcon Landing

Historical period artifacts were recovered from four features and the surface of Falcon Landing. The results of the artifact analysis are presented according to provenience and functional category, below.

Feature 1664

Feature 1664 yielded five pieces of ammunition, all shotgun shells. Four shotgun shells were recovered from the feature fill. All were 12-gauge-diameter shells, and all were heavily corroded. Only one headstamp remained partially legible; it read "[WINCHESTER/LEADER]/№ 12". The other three bore illegible headstamps. The "1901 Leader" was produced by the Winchester Repeating Arms Company in the 1900s and continued in production for many decades. The shotgun shells had red, roll-crimped paper barrels. The company claimed that the cartridge was the "finest smokeless powder shell science can produce," and this headstamp continued in use to 1920 (Farrar 2013). A fifth 12-gauge shotgun shell was retrieved from HSU 1666, which was associated with Feature 1664. It was marked "[WINCHESTER]/LEADER/№ 12". As previously mentioned, this headstamp was in use from the 1900s to 1920 (Farrar 2013).

Feature 4624

Feature 4624 produced two small, nondiagnostic metal-can fragments.

Feature 2629

Two tiny fragments of very thin rubber were retrieved from the uppermost level of Subfeature 6798 of Feature 2629.

Surface Artifacts

The rest of the Historical period artifacts from Falcon Landing were retrieved from the general scatter on the site surface. Surface artifacts from the site are described in the following text and are also listed in Table D.1.

Construction

In total, 100 aqua-window-glass fragments were retrieved from the site. The glass measured $^1/_{20}$ inch (1.33 mm) in thickness.

Food/Beverage Container

Four fragments of two large-capacity aqua jars or bottles were retrieved from the site surface. One base was embossed "25", and the other was embossed "120/G". The vessels may have been beverage bottles or canning jars.

Table D.1. Historical Period Artifacts from the Surface of Falcon Landing

Material Class, by Functional Category	Artifact Type	Description	Production Date(s)	Citation	Count	MNI
Construction						
Glass	window pane	aqua, 0.05 inches thick	pre-1930	Lindsey 2013	100	1
Food/beverage container						
Glass	bottle/jar	aqua, “25”, “120/G”	pre-1930	Lindsey 2013	4	2
Glass	bottle/jar	aqua	pre-1930	Lindsey 2013	1	1
Metal	can	hole-in-top	1900–present	University of Utah 2013:471	2	2
Metal	can	hole-in-cap, “2/STAR”	pre-1900	Rock 1987:12	1	1
Metal	can	fragment			1	1
Metal	can	interior-friction closure			1	1
Metal	can	lid, “LIFT”			1	1
Heating/energy						
Ceramic	insulator	tube	post-1910	Tod 1977:155	1	1
Household furnishings						
Ceramic	doorknob	jet			2	2
Metal	furniture spring	conical spiral			1	1
Lighting						
Glass	lamp	SCA	post-1864	Russell 1968:131	24	1
Medical/health						
Glass	bottle	SCA, “S[LOAN’S LINIMENT/KILLS [PAIN]”	1852–1929	Fike 1987:137	7	1
Glass	bottle	SCA, bitters			3	1
Glass	bottle	SCA, “SUN”			1	1
Tools/hardware						
Metal	nail	wire	1900–present	Wells 1989:87	17	17
Metal	fence staple				6	6
Total					173	41

Key: MNI = minimum number of individuals.

A single fragment of a cylindrical aqua bottle or jar was identified. Its original contents and manufacturer remain unidentified. These aqua-glass vessels were likely produced before about 1930 (Lindsey 2013).

Portions of two hole-in-top condensed- or evaporated-milk cans were recovered. One measured $2^3/_8$ inches in diameter and $2^3/_8$ inches in height; the other had the same diameter and an indeterminate height. These cans were produced throughout the twentieth century (University of Utah 2013:471). One hole-in-cap can measured $2^5/_8$ inches in diameter and 4 inches in height. The cap was embossed "2/STAR . . .". Hole-in-cap cans were produced until the sanitary can became widely produced after about 1900 (Rock 1987:12).

Another can fragment was nondiagnostic. One additional can would have been closed with an interior-friction lid; this type of can was used to contain dry items, such as cocoa powder, baking soda, and tobacco. It measured 3 inches in diameter and 4 inches in height.

A spout cover had a rolled edge and was embossed "LIFT" with an arrow pointing downward. The lid had been pried up and would not have been intended for repeated use.

Heating/Energy

One fragment of a kaolin electrical insulator was retrieved. It was an unglazed tube insulator measuring $^5/_{16}$ inches in internal diameter and $^9/_{16}$ inches in outside diameter. The original length could not be determined from the fragment, but these insulators were produced in lengths ranging from $^1/_2$ to 50 inches (Tod 1977:32, 43, 49). Tube insulators were used where wiring ran through wall studs, rafters, or similar building parts (Tod 1977:55), and various types of tube insulators were patented in the 1910s (Tod 1977:155).

Household Furnishings

Two jet doorknobs (Eastwood 1976:46–47) were represented by one fragment each. The doorknobs were made of fired terra-cotta clay with an opaque black glaze, sometimes called "ebony." Probably, the two knobs represent a set that was attached with a metal spindle. This type of doorknob was advertised in the 1895 Montgomery Ward & Co. catalog (Montgomery Ward & Co. 1969:375) at a price of $0.08 each, or $0.87 per dozen. Two years later, the Sears Roebuck & Co. catalog advertised the doorknobs at the same price (Sears Roebuck & Co. 2007:104).

One furniture or mattress spring was recovered: a conical spiral with a maximum diameter of $3^1/_2$ inches and a height of about $4^1/_2$ inches.

Lighting

Twenty-four fragments of sun-colored-amethyst (SCA) glass were from the base and font of a kerosene-burning table lamp. The plain, round, press-molded pedestal base measured 6 inches in diameter. By 1864, the most commonly used lamp fuel in North America was kerosene (Russell 1968:131), and it was in use "by all social strata and in all geographic locations" (Woodhead et al. 1984:38). Very similar examples, identified as "stand lamps," were advertised in catalogs dated 1895 (Montgomery Ward & Co. 1969:551), 1897, and 1902 (Sears Roebuck & Co. 1902:801, 2007:626), and the lamps ranged in price from $0.30 to $0.45.

Medical/Health

Seven fragments of an SCA-glass medicine bottle were embossed "S[LOAN'S LINIMENT]/KILLS [PAIN]". The bottle was a Blake Variety 1 shape with a flat or patent rim. It would have been closed with a cork or a rubber stopper. Still in production today, Sloan's Liniment is a topical pain treatment containing capsaicin and turpentine oil. The product was developed by veterinarian Andrew Sloan for use on horses, but his son, Earl Sloan, made a fortune by after-marketing the product for human use. The product motto was "Good for Man and Beast" (Hover et al. 1919:330). The product was packaged in this type of bottle from about 1852 to 1929 (Fike 1987:137).

A French-square bitters bottle was represented by three fragments of SCA glass. The complete base was unmarked. Bitters purportedly had medicinal qualities, and they contained extracts of gentian root, hop flowers, quinine, and bitter-orange peel, as well as aromatic flavorings, sugar, and alcohol (Wilson 1981:23). The preparations could contain as much as 40 percent alcohol, and the bottles were larger than those of other medicines, their capacity exceeding even that of some whiskey bottles.

A single shard of SCA glass was from a Blake Variety 1 or French-square medicine bottle. It was embossed with a sunburst and the word "SUN". The product and manufacturer remain unidentified. The bead finish of one medicine bottle was also SCA glass. Three additional fragments of SCA glass were from a Hopkins-square bottle or a round-cornered Blake bottle.

Tools/Hardware

Metal hardware collected from Falcon Landing included a variety of nails and fence staples. Nails in the collection were all-purpose, common nails ranging in size from 12d ($3^1/_2$ inches) to 3d ($1^1/_4$ inches). These nails would have been useful in most standard, rural construction applications. Wire nails came to dominate the market between 1900 and 1920 (Wells 1989:87) and, of course, remain in production today. Six fence staples were recovered.

Chronology and Interpretations

Archival research completed during the initial archaeological investigations at Falcon Landing (Tagg et al. 2007:72–77) detailed the history of property ownership and land use for this parcel. The findings are summarized here. A. W. Dunstan filed a homestead entry for the SE $^1/_4$ of Section 8 in January 1911 (Maricopa County 1914). No evidence was found that Dunstan occupied the property or built a dwelling there. In 1917, Teddy Louis Pemma, a naturalized U.S. citizen of Austrian birth, filed a homestead entry on the same quarter-section of land; he established residency there the following year (General Land Office [GLO] 1920; Maricopa County 1923). Records indicated that the parcel comprised 120 cultivable acres and 40 acres of wash (GLO 1920). In 1919 and 1920, Pemma planted small amounts of milo maize (10 and 20 acres, respectively) but reaped a "very poor crop" (GLO 1920). Pemma "proved up" on his claim in 1920, by which time he had constructed improvements valued at $800.00, including a 12-by-14-foot frame house surrounded by a fence (GLO 1922). Pemma continued to hold title to the property in 1929 (Maricopa County 1929).

By 1940, when Katherine L. Hyde of Akron, Ohio, purchased the quarter-section, Eleanor Dora Pemma, a single woman (likely Teddy's widow or daughter), was the owner of record (Maricopa County Recorder's Office 1940). After Luke Air Force Base was reactivated in February 1951, the U.S. Air Force entered into an agreement with Hyde to purchase two discontiguous parcels totaling approximately 12 acres in the western quarter of her 160-acre parcel. At the time of the acquisition, the parcel was described as "undeveloped desert land with a light growth of brush, and fairly level" (U.S. Army Corps of Engineers 1952). Evidence that the property contained livestock at that time was found in Hyde's stipulation that "the Government shall keep all gates closed when not in use and shall provide adequate protection to livestock grazing in the area" (U.S. Army Corps of Engineers 1953). Eventually, the remaining portions of the SE $^1/_4$ of Section 8 were appropriated by the Air Force. Falcon Landing encompasses a large portion of the SE $^1/_4$ of Section 8.

Temporally diagnostic artifacts from Falcon Landing had production-date ranges spanning most of the nineteenth and twentieth centuries. However, most of the production dates clustered between about 1900 and 1930 (see Table D.1). No clear-glass artifacts were recovered, suggesting that artifacts were not deposited at the site after about 1930. This information corresponds neatly to the duration of Teddy Louis Pemma's occupation of the site and suggests that later owners did not live on the homestead.

We do not know precisely where the house Pemma constructed was located, but the scatter of window glass and nails confirmed the presence of a building in the area. The fence staples may relate to the fence that reportedly surrounded the house or to fencing around livestock enclosures. Pemma's home was, in all probability, not equipped with electrical power—a likelihood supported by the presence of kerosene-lamp parts—although this does not account for the insulator fragment. The lamp, furniture or mattress spring, and jet doorknobs revealed a bit about the home and furnishings. Glass and metal containers for medicines, health-related products, and foodstuffs were present, but no food-preparation or -consumption artifacts were found. No discrete location of refuse disposal was identified within the site boundaries. It is possible that Pemma incinerated trash or transported it to another location for disposal. Archival evidence revealed that Pemma was away from the homestead for months at a time, employed as a farm laborer for the Southwest Cotton Company (GLO 1918, 1920), and the actual durations of his periods of occupancy are not known.

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Historic Property Inventory Form

STATE OF ARIZONA HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property. ***Use continuation sheets where necessary****. Send completed form to: State Historic Preservation Office, 1300 W. Washington, Phoenix, AZ 85007*

PROPERTY IDENTIFICATION

For properties identified through survey: Site No: AZ T:7:424 (ASM) Survey Area: Luke Air Force Base

Historic Name(s): Rancho La Loma Well

(*Enter the name(s), if any, that best reflects the property's historic importance*.)

Address: South of West Super Sabre Street, Luke Air Force Base

City or Town: Litchfield Park ☒ vicinity County: Maricopa Tax Parcel No.: _____-_____-_____
Township: 2 North Range: 1 West Section: 8 Quarter Section: SE Acreage: 0.275

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM reference: Zone 12 N Easting 371807 Northing 3710872 USGS 7.5' quad map: Waddell, AZ 1976

Architect: _____ ☒ not determined ☐ known (source: _____)

Builder: _____ ☒ not determined ☐ known (source: _____)

Construction Date: March 1, 1952 ☒ known ☐ estimated (source: Arizona Department of Water Resources)

STRUCTURAL CONDITION

☒ Good (*well maintained, no serious problems apparent*)

☐ Fair (*some problems apparent*) Describe: _____

☐ Poor (*major problems; imminent threat*) Describe: _____

☐ Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use. The well was drilled to provide nonpotable water to the Rancho La Loma residential property owned by Mr. and Mrs. P. W. Litchfield (see continuation sheet).

Sources: Arizona Department of Water Resources

PHOTO INFORMATION

Date of photo: August 4, 2010

View Direction (*looking towards*): southeast

Negative No.: IMGP0004

SIGNIFICANCE

To be eligible for the National Register of Historic Places, a property must represent an important part of the history or architecture of an area. Note: a property need only be significant under one of the areas below to be eligible for the National Register.

A. HISTORIC EVENTS/TRENDS (*On a continuation sheet describe how the property is associated either with a significant historic event, or with a trend or pattern of events important to the history of the nation, the state, or a local community.*)

B. PERSON (*On a continuation sheet describe how the property is associated with the life of a person significant in the past.*)

C. ARCHITECTURE (*On a continuation sheet describe how the property embodies the distinctive characteristics of a type, period, or method of construction, or that represents the work or a master, or possesses high artistic values.*)

Outbuildings: (*Describe any other buildings or structures on the property and whether they may be considered historic.*)
_____

INTEGRITY

To be eligible for the National Register, a property must have integrity, that is, it must be able to visually convey its importance. Provide detailed information below about the property's integrity. Use continuation sheets if necessary.

1. LOCATION ☒ Original Site ☐ Moved (date: _____) Original Site: _____

2. DESIGN (*Describe alterations from the original design, including dates—known or estimated—when alterations were made*)
See continuation sheet.

3. SETTING (*Describe the natural and/or built environment around the property*) See continuation sheet.

Describe how the setting has changed since the property's period of significance: _____

4. MATERIALS (*Describe the materials used in the following elements of the property*)
Walls (structure): _____ Foundation: concrete Roof: _____
Windows: _____
If the windows have been altered, what were they originally? _____
Wall Sheathing: _____
If the sheathing has been altered, what was it originally? _____

5. WORKMANSHIP (*Describe the distinctive elements, if any, of craftsmanship or method of construction*)
_____

NATIONAL REGISTER STATUS (if listed, check the appropriate box)

☐ Individually listed; ☐ Contributor ☐ Noncontributor to _____ Historic District
Date Listed: _____ ☐ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS OF ELIGIBILITY (opinion of SHPO staff or survey consultant)

Property ☐ is ☒ is not eligible individually.
Property ☒ is ☐ is not eligible as a contributor to a potential historic district.
☐ More information needed to evaluate.
If not considered eligible, state reason:_____

FORM COMPLETED BY:

Name and Affiliation: Scott Thompson, Statistical Research, Inc. Date: July 2013
Mailing Address: 6099 E Speedway Blvd., Tucson, AZ 85712 Phone No.: 520-721-4309

==

The Rancho La Loma Well and distribution system are located on lands under the jurisdiction of Luke Air Force Base (AFB), Arizona. According to the records on file with the Arizona Department of Water Resources (2010), the well was drilled on March 1, 1952, to a depth of 578 feet. With a casing diameter of 20 inches, the well has a maximum pumping capacity of 1,200 gallons per minute. From 1984 to 2008, the withdrawal of water from the well fluctuated between 70 and 116 acre-feet of water per year. Sun Health Properties, Inc., is the current owner of the well and its appurtenant works.

The well was drilled in 1952 to provide nonpotable water to the Rancho La Loma residential property owned by Mr. and Mrs. P. W. Litchfield and located approximately 1 mile to the southeast. The well was originally situated on a 142.95-acre parcel owned by the Litchfields. Following the deaths of Mr. and Mrs. Litchfield, Edith and A. Wallace Denny—their daughter and son-in-law, respectively—inherited Ranch La Loma and several adjacent parcels. In April 1999, the Denny family deeded the 142.95 acres containing the well site to Sun Health Properties, Inc. In turn, Sun Health Properties, Inc., deeded the property to the U.S. Air Force (Air Force) in 2004, retaining rights only to the underlying groundwater and the well and its appurtenant works. That same year, the Air Force granted Sun Health Properties, Inc., easements for the well site, the pipeline right-of-way, and the electrical-distribution-line right-of-way. The well-site easement is located in the NW 1/4 of the SE 1/4 of Section 8, on a 100-by-120-foot parcel containing 12,000 square feet, or 0.275 acres. Luke AFB granted Sun Health Properties, Inc., a 20-foot-wide easement for the underground waterline that extends from the well site for approximately 2,888 feet in a southeasterly direction, to the southeastern corner of Section 8. The utility easement consists of a 33-foot-wide strip of land that begins in the northeastern corner of Section 8 and extends west for a distance of about 1,661 feet. At present, the well system is operational and conveys water to the Sun Health Properties, Inc., La Loma Campus (located immediately west-southwest of the Rancho La Loma homestead), where it is used for landscaping purposes (Department of the Air Force 2004a, 2004b, 2004c; Sue Witter, personal communication 2010).

The aboveground features at the well site consist of a 13-by-13-foot poured-concrete slab that surrounds the well head and supports the electric pump, a cast-iron-pipe water-distribution system, and a metal shed that houses an electrical-outlet box for providing power to the pump. A chain-link fence surrounds the well site. A line of utility poles running east-west and parallel to the southern side of Super Sabre Street provides electricity to the well site. These are of relatively recent construction. The original utility poles, which likely date to 1952, are still in place and trend in a southeasterly direction from the well site to the southeastern corner of Section 8. Atop the well head is a vertical-turbine pump that draws groundwater upward to a discharge pipe approximately 14 inches in diameter. The discharge pipe is bifurcated with turn-wheel valves that control the delivery of water to either an underground pipeline (for ultimate delivery to Sun Health Properties, Inc., La Loma Campus) or an aboveground discharge pipe that empties into a shallow, unlined ditch. The ditch trends in an east-southeasterly direction for about 300 feet, at which point it intersects with another ditch in a north–south alignment that continues south to a point near the southern boundary of Section 8.

It is clear that the well, the water-distribution system, and the original utility poles and transmission lines are associated with Rancho La Loma. At present, Rancho La Loma remains unevaluated. It is possible that if the property is evaluated in the future it may be found eligible for listing in the National Register of Historic Places (NRHP). In the absence of an analytical framework for evaluating the historical significance of Rancho La Loma, the well and water-distribution system must be considered on their own merits. As elements of infrastructure, they are representative of countless other water-supply systems in the area and lack the physical and associative characteristics to convey their historical significance. Therefore, the well and its appurtenant works are recommended not eligible for listing in the NRHP. Even though the aboveground features at the well site and the old utility poles and distribution lines are recommended not eligible for listing in the NRHP, they are considered contributing elements to the Rancho La Loma residence, a property that has not been evaluated but may be NRHP eligible.

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