Updated General Historic Properties Treatment Plan for the City of Phoenix, Maricopa County, Arizona

Prepared for

City of Phoenix

City Archaeology Office
Arts and Culture Department
S’eḏav Va’aki Museum
4619 E. Washington Street
Phoenix, Arizona 85034

S’eḏav Va’aki Museum (Pueblo Grande Museum) Project No. 2021-069

Cultural Resources Report No. 2023-247
WestLand Project No. 10802

Prepared by:

Joseph A. Bryce, Stephanie A. Brown, Jennifer Levstik,
Jocelyn Bernatchez, and Mark L. Chenault

Reviewed and Submitted by:

Jocelyn A. Bernatchez, Ph.D.
WestLand Engineering & Environmental Services
4001 E. Paradise Falls Drive
Tucson, Arizona 85712
+1 520-206-9585

August 13, 2024

TABLE OF CONTENTS

Figures

Tables

Appendices

ABSTRACT

City of Phoenix Project Number: S'eḏav Va'aki Museum (Pueblo Grande Museum) No. 2021-069

Report Title: Updated General Historic Properties Treatment Plan for the City of Phoenix, Maricopa County, Arizona

Report Dates: November 10, 2023; revised January 26, 2024; revised February 1, 2024; revised May 17, 2024; revised June 11, 2024; revised July 25, 2024; revised July 30, 2024; final August 13, 2024

Agencies: City of Phoenix (COP), inclusive of all departments; COP Arts and Culture Department, Archaeology Section; COP Historic Preservation Office; and Arizona State Historic Preservation Office

Applicable Historic Preservation Regulations: COP Historic Preservation Ordinance (Zoning Ordinance Chapter 8); Arizona State Historic Preservation Act (Arizona Revised Statute [A.R.S.] § 41-861, et seq.); Arizona Antiquities Act (A.R.S. § 41-841, et seq.); A.R.S. § 41-844 and A.R.S. § 41-865; COP 2020 Guidelines for Archaeology; and National Historic Preservation Act, 36 Code of Federal Regulations Part 800, Section 106

Project Description: Providing a general historic properties treatment plan for archaeological testing and data recovery projects located within or near cultural resource sites in Phoenix, Arizona

Acreage and Land Jurisdiction: Acreage will vary by project. Jurisdiction is COP owned or controlled, including leased land, right-of-way, other city-owned land, and private projects that apply for zoning changes and/or permits for Planning and Zoning and/or the Development Services Department.

Location: The project area or "area of potential effects" is within Phoenix, Maricopa County, Arizona. It may also include land owned or controlled by the COP outside the city boundary. The specific location will be determined with each individual project.

Type of Archaeological Activity: Arizona/National Register of Historic Places eligibility testing, boundary extent or identification testing, Phase I data recovery, and Phase II data recovery

Comments: This document presents a general plan of work to conduct cultural resource testing and data recovery for COP projects that are city-, state-, or federally funded and that are located within 250 feet (76.2 m) of, or are within, one or more cultural resource sites, as indicated by the S'eḏav Va'aki Museum database. Federal agencies must concur with the use of this Historic Properties Treatment Plan (HPTP) for federally funded projects. The Arizona State Museum must also approve the use of the HPTP for projects requiring an Arizona Antiquities Act permit. The COP Archaeologist may authorize the use of this HPTP by private parties conducting projects within the city. However, the use of this plan by private parties will require a written application to the COP Archaeologist. The COP Archaeologist will determine whether the HPTP may be used for such projects on a case-by-case basis.

Statement of Confidentiality: Disclosure of the locations of historic properties to the public may be in violation of both federal and state laws. Applicable United States laws include, but may not be limited to, Section 304 (54 United States Code [U.S.C.] § 307103) of the National Historic Preservation Act and the Archaeological Resources Protection Act (16 U.S.C. § 470hh). In Arizona, applicable state laws include, but may not be limited to, A.R.S. Title 39, Section 125.

GENERAL NOTE

This general historic properties treatment plan, including but not limited to the research design and field methods, has been developed in consultation with affiliated Tribes.

Section 106 undertakings involving phased data recovery shall also plan to collaborate with consulting Tribes, on the results of the fieldwork, to properly, adequately, and respectfully account for Tribal views, values, perspectives, and beliefs. Consulting Tribes shall be offered the opportunity to produce a meaningfully contributing narrative about their own histories and Tribal values of the site within the associated landscape.

ARTS AND CULTURE DEPARTMENT
LAND ACKNOWLEDGMENT STATEMENT

We acknowledge that modern-day Phoenix is on the traditional lands of the Akimel O'Odham (Pima) and the Tohono O'Odham and before that their ancestors (Hohokam) as well as the Piipaash (Maricopa). We honor the elders of both past and present, as well as future generations that enable us to live here today. Further, we acknowledge the sovereignty of the **22 Tribal Nations** who continue to steward the lands that make up the state of Arizona.

GENERAL ACKNOWLEDGMENTS

WestLand Engineering & Environmental Services (WestLand) prepared this general Historic Properties Treatment Plan at the request of the City of Phoenix under an on-call contract with the City Finance Department. City Archaeologist Laurene Montero, Rebecca Hill of the City Archaeological Office, and Lindsey Vogel-Teeter of the S'eḏav Va'aki Museum provided guidance on the content and organization of this document and contributed critical reviews of the drafts.

Two Tribal consultation meetings were held during the early stages of drafting this document. The meetings were held on March 16, 2023, and June 1, 2023, and included representatives from the Gila River Indian Community Tribal Historic Preservation Office, the Salt River Pima-Maricopa Indian Community Tribal Historic Preservation Office, the City of Phoenix Archaeology Office, the S'eḏav Va'aki Museum, and WestLand. Perspectives, comments, and guidance received during these meetings were crucial to the development of this plan.

Written comments were also received from the Gila River Indian Community Tribal Historic Preservation Office, the Salt River Pima-Maricopa Indian Community Tribal Historic Preservation Office, the Pascua Yaqui Tribal Historic Preservation Office, the Arizona State Museum, the Arizona State Historic Preservation Office, and the Federal Aviation Administration in response to a consultation request from the City of Phoenix on March 20, 2024. Additional written comments were received from the Hopi Tribe Tribal Historic Preservation Office, the Pascua Yaqui Tribal Historic Preservation Office, the State Historic Preservation Office, the Salt River Project, and the Bureau of Reclamation following a subsequent consultation request from the City of Phoenix on June 13, 2024.

LIST OF ACRONYMS

AAA	Arizona Antiquities Act
ADOT	Arizona Department of Transportation
ARHP	Arizona Register of Historic Places
ARPA	Archaeological Resources Protection Act
A.R.S.	Arizona Revised Statute
A.R.S. § 41-844	Arizona's legal statute for the protection of all cultural resources, including but not limited to human remains, funerary objects, sacred ceremonial objects, and objects of national or Tribal patrimony, on state, municipal, and county land
A.R.S. § 41-865	Arizona's legal statute for the protection of human remains and funerary objects on private land
ASM	Arizona State Museum
AZPDES	Arizona Pollutant Discharge Elimination System
BDA	Burial Discovery Agreement
CAO	City [of Phoenix] Archaeology Office
CCC	Civilian Conservation Corps
CFR	Code of Federal Regulations
COP	City of Phoenix
EOF	End-of-fieldwork [report]
EPG	Environmental Planning Group
F	Fahrenheit
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
GPS	Global Positioning System
HPTP	Historic Properties Treatment Plan
HSU	Hand stripping unit
HUD	Department of Housing and Urban Development
I-10	Interstate Highway 10
LSD	Logan Simpson Design
MSU	Mechanical stripping unit
NAGPRA	Native American Graves Protection and Repatriation Act
NHPA	National Historic Preservation Act
NISP	Number of identified specimens
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
OSL	Optically Stimulated Luminescence
PMAP	Pueblo Grande Village Mapping Project
SAR-OSL	Single Aliquot Regeneration-Optical Stimulated Luminescence
SHPA	Arizona State Historic Preservation Act
SHPO	Arizona State Historic Preservation Office
SR	State Route
SRP	Salt River Project
SWCA	SWCA, Inc., Environmental Consultants
TL	Thermoluminescence
U.S.C.	United States Code
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator

INTRODUCTION

This document presents a treatment plan to serve as a general guideline for small- to medium-sized Arizona/National Register of Historic Places (A/NRHP) cultural resource eligibility testing, boundary extent or identification testing, and Phase I and Phase II data recovery projects for City of Phoenix (COP) projects within a site, within a 250-foot buffer zone surrounding a site, or within a 50-foot buffer zone surrounding a canal. The determination of when a project can be considered small or medium sized is subjective and will be made in consultation with the City Archaeologist. Projects that may affect large areas of major archaeological sites, multi-year projects, or projects at unusual sites may require a separate treatment document. Other projects will use this Historic Properties Treatment Plan (HPTP). The purpose of this updated general HPTP is to ensure a consistent approach to the treatment of cultural resources in COP projects and to streamline the historic preservation consultation process by identifying a set of approved field and research methods for archaeological testing and data recovery for COP projects. For the purposes of this document, the term "cultural resources" refers to prehistoric or historical archaeological sites or objects. This HPTP was prepared by WestLand Engineering & Environmental Services (WestLand) under an existing COP on-call archaeological services agreement (Contract No. 148354). The HPTP was produced in coordination with Laurene Montero, COP Archaeologist (S'eḏav Va'aki Museum—formerly known as Pueblo Grande Museum—Project No. 2021-069).

The HPTP is to be used for cultural resource investigations associated with all types of ground-disturbing projects that may be conducted by various departments within the COP and applies to both prehistoric and historical archaeological sites. The HPTP is intended to be used for COP-sponsored projects on COP-owned land (including but not limited to Department of Housing and Urban Development [HUD]-funded, Federal Aviation Administration [FAA]-approved, U.S. Army Corps of Engineers-permitted, and Federal Highway Administration [FHWA]-funded projects), utility projects permitted by the COP in COP right-of-way, projects involving COP-owned facilities inside and outside the COP boundary (e.g., Goodyear Airport), and private developer projects within COP right-of-way or on private land **(Figure 1)**. Examples of project types include commercial/private development, commercial/recreational development (e.g., stadiums), affordable housing, street or sidewalk improvements, waterline installations, COP facility utility upgrades, and COP parks renovation and development (e.g., new ramadas, restrooms, and trailhead improvements).

The COP Archaeologist will determine if a specific project may use the HPTP or if a separate treatment document is warranted (i.e., larger, more complex cultural resource investigations may require separate treatment plans). A written request (email is sufficient) is required to use the HPTP, and a site-specific work plan addendum is always required for each project. The addendum must consist of a completed General Historic Properties Treatment Plan Addendum Form **(Appendix A)** and a figure showing the proposed excavation plan. The figure is to include a key, scale, four Universal Transverse Mercator (UTM) points, and a north arrow.

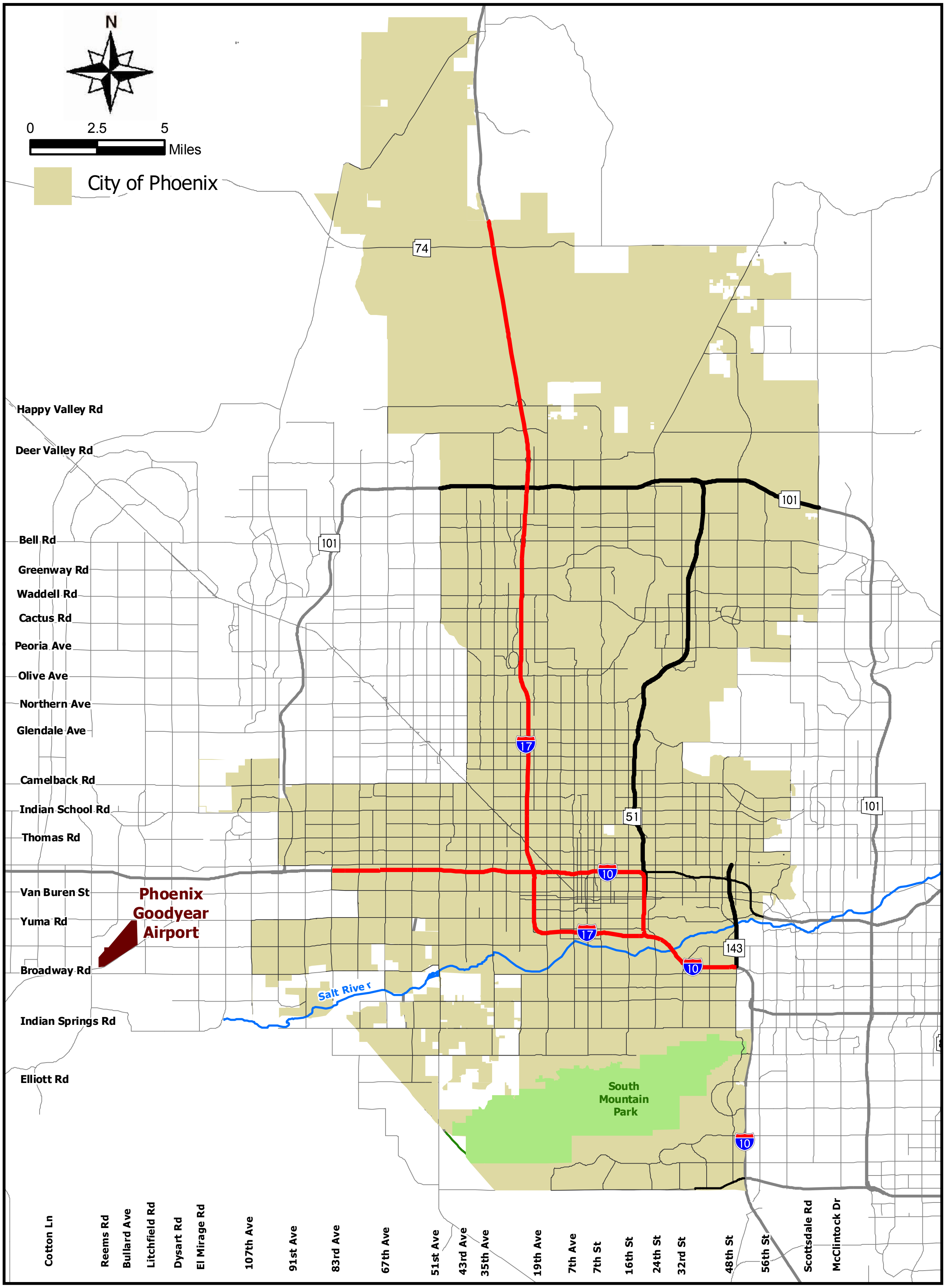

Figure 1. City of Phoenix boundaries and the location of the Phoenix Goodyear Airport

Users of the HPTP are responsible for obtaining their own Arizona Antiquities Act (AAA) project-specific permit from the Arizona State Museum (ASM), as applicable, as well as their own Burial Discovery Agreement (BDA) from the ASM. Because repatriation requirements often change, this is important for all projects.

The HPTP can be used by other agencies upon request and COP Archaeology Office (CAO) approval. The COP Archaeologist will make the determination if the general HPTP's methods and research design are appropriate for the scope of the project and the resources to be impacted. Agencies commonly conducting projects within the COP or surrounding areas include but are not limited to the Bureau of Reclamation, the Federal Communications Commission, Salt River Project (SRP), and Valley Metro. Agencies are required to submit a copy of the resulting technical report to the CAO either for review or as a courtesy, depending on project specifics. Users of the HPTP are also responsible for obtaining the most recent guidelines for all work conducted under this plan, including CAO guidelines, S'eḏav Va'aki Museum repository guidelines, ASM and Arizona State Historic Preservation Office (SHPO) guidelines, etc.

The project-specific Addendum Form and figure will be reviewed by the CAO, relevant agencies and Tribes, where applicable, and appropriate individuals from the sponsoring COP department. Cultural resource investigations may not commence until approval has been received from all applicable parties.

The methods and procedures outlined in this document meet all CAO standards and procedures, including those in the *City of Phoenix Guidelines for Archaeology* (COP 2020a or subsequent updates) and the *Pueblo Grande Museum Archaeological Repository Guidelines* (COP 2020b or most recent update). **Table 1** [next page] summarizes the municipal, state, and federal laws and the legal nexuses that trigger compliance with them.

The methods presented herein are designed to comply with the COP Historic Preservation Ordinance (Chapter 8, Section 802[B2]), administered by the CAO; the AAA (A.R.S. § 41-841, et seq.), administered through the ASM Permits Office; A.R.S. § 41-844, administered by the ASM State Repatriation Office (applies to all cultural resources including but not limited to human remains, funerary objects, sacred ceremonial objects, and objects of national or Tribal patrimony encountered on municipal land; A.R.S. § 41-865 (applies to human remains and funerary objects encountered on private land); and the National Historic Preservation Act (NHPA) (for projects with a federal nexus—FAA, FHWA, HUD, etc.). If there is no federal or state nexus for eligibility determinations, the SHPO makes the formal determination of eligibility. The methods and procedures outlined in this plan are designed to meet or exceed the Secretary of the Interior's Standards and Guidelines for archaeological documentation (*Federal Register* 49 FR 44734–37) as well as the reporting and fieldwork standards required by the SHPO and the ASM. This HPTP does not address the historic preservation of standing historical buildings, structures, districts, or other standing elements of the historical built environment. It does, however, address the treatment of subsurface archaeological remains affiliated with those properties.

Table 1. Applicable historic preservation laws and legal nexuses for COP projects[a]

Legal Nexus	COP Chapter 8, Section 802[B2]	A.R.S. § 41-865	AAA (including A.R.S. § 41-844)	SHPA	NHPA Sec. 106	ARPA	NAGPRA
LAND OWNERSHIP							
Private (within city limits)	X	X	–	–	–	–	–
Municipal	X	–	X	–	–	–	–
State	X	–	X	X	–	–	–
County	X	–	X	–	–	–	–
Federal	X	–	–	–	X	X	X
FUNDING							
Private	X	–	–	–	–	–	–
Municipal	X	–	–	–	–	–	–
State	X	–	–	X	–	–	–
County	X	–	–	–	–	–	–
Federal	X	–	–	–	X	–	X

[a]**Legal abbreviations:**

- City of Phoenix Historic Preservation Ordinance (Chapter 8, Section 802[B2])
- **Arizona Revised Statute (A.R.S.) § 41-865:** Arizona's legal statute for the protection of human remains and funerary objects on private land
- **A.R.S. § 41-844:** Arizona's legal statute for the protection of cultural resources on state, municipal, and county lands, including human remains, funerary objects, sacred ceremonial objects, and objects of national or Tribal patrimony
- **AAA:** Arizona Antiquities Act, A.R.S. § 15-1631 and § 41-841, et seq.
- **SHPA:** Arizona State Historic Preservation Act, A.R.S. § 41-861, et seq.
- **NHPA Section 106:** Section 106 of the National Historic Preservation Act, 54 United States Code (U.S.C.) § 306108
- **ARPA:** Archaeological Resources Protection Act, 16 U.S.C. § 70aa–470mm
- **NAGPRA:** Native American Graves Protection and Repatriation Act, 25 U.S.C. § 3001–3013. Although primarily applicable for work on federal and Tribal lands, human remains and cultural items recovered from private or state land may be subject to NAGPRA as a holding or collection.

Whereas this plan guides investigations that are in or near cultural resource sites, several additional guides have been prepared to assist in more specific applications. Monitoring projects and discovery situations should use the *General Monitoring and Discovery Plan for the City of Phoenix, Maricopa County, Arizona* (Henderson 2020 or the most recently updated version).

City Archaeology Office Initiatives

An important initiative of the CAO is a pilot project called The Phoenix Mapping Archaeology Project (PMAP). An ESRI file geodatabase data structure was created into which existing project data from S'eḏav Va'aki were migrated (Mitchell et al. 2022). PMAP recorded archaeological projects conducted in the village of S'eḏav Va'aki, both within and outside the former Pueblo Grande Museum and Archaeological Park—now called the S'eḏav Va'aki Museum.

PMAP translated data from various formats, including analog (field notes, reports, etc.), ESRI shapefiles, and computer-aided design maps, into a consistent format. This task is almost complete for features and excavation areas, and the next step will be to include artifact and subfeature data.

Based on the PMAP study, the CAO and a team of volunteers have expanded their efforts and are working to standardize and incorporate archaeological excavation data from other ancestral village sites along the lower Salt River Valley into a master geodatabase. A template has been created for these data so that archaeologists can provide their results to the CAO in a compatible format.

The PMAP project will establish a consistent geodatabase structure for the storage and access of archaeological spatial data for large village sites in the city of Phoenix. In addition to being a management tool, the goals for this Geographic Information Systems (GIS) mapping project are similar to those research goals described herein—specifically, to be used as an analytical tool for understanding settlement patterns within and between prehistoric village sites. Another important goal is to provide content for potential S’eḏav Va’aki Museum exhibits such as story maps and interactive computer maps.

ENVIRONMENTAL SETTING

The city of Phoenix is located in the Basin and Range physiographic province of Arizona, with the South Mountains to the south, the Phoenix Mountains to the north, the Sierra Estrella Mountains to the southwest, and the Superstition Mountains to the east. The Salt River is usually dry but flows east to west through the valley. Elevations range from approximately 950 to 2,700 feet above mean sea level.

The area has a mean annual temperature of 72ºFahrenheit (F), a July maximum of 104.4ºF, and a January minimum of 41ºF. Sunshine averages 86 percent of the possible days, with a January minimum of 78 percent and a June maximum of 94 percent. There are two rainfall seasons: the first during July and August, with moisture from the Gulf of Mexico, off the west coast of Mexico, and in the Gulf of California, and the second from November through March, with occasional storms from the Pacific Ocean.

Vegetation is a combination of the Lower Colorado River Valley subdivision—characterized by the creosote-white bursage-salt bush series—and the Arizona Upland subdivision of the Sonoran Desertscrub—characterized by the palo verde-cactus-mixed scrub series (Brown 1994). Destruction of riparian habitat has occurred along the lower Salt River in all but a few areas, and native vegetation is rare due to encroachment from the expansion and development of the city of Phoenix. There is also a great deal of agriculture along the river. Faunal diversity has decreased markedly in the area for these same reasons, with large numbers of remnant native species found only in some mountain enclaves (Darling 2005:2-1 to 2-2; Loendorf et al. 2011:9–11).

Many of the projects using this plan will be in urban settings in the city of Phoenix characterized by modern development, clearing, and grading, although many still contain buried archaeological resources. Portions of intact natural ground surface are still present in Phoenix, but a large amount of the city surface consists of disturbed or developed land.

CULTURAL SETTING

The cultural setting for the Phoenix area is discussed in the following sections and presented in **Figure 2**.

Pre-Paleoindian Period (ca. 11,500–10,000 B.C.)

The existence of a paleolithic occupation of the Americas has been debated—and often rejected—for decades (Boldurian and Cotter 1999:1–3; Faught and Freeman 1998). Many purported early man sites identified in the nineteenth and early twentieth centuries were hoaxes, and few sites older than 13,500 calibrated radiocarbon years before present (B.P.) have been securely dated or excavated by reputable scholars (Faught and Freeman 1998:33–38). As careful stratigraphic excavation techniques and radiocarbon dating demarcated the Clovis horizon during the 1930s through 1960s, the possibility of earlier occupations was vigorously rejected.

Sites in Virginia (Cactus Hill), South Carolina (the Topper Site), Texas (Buttermilk Creek and Gault), and Chile (Monte Verde) do seem to contain intact cultural deposits that date to before 13,500 B.P. (Collins 2005; Madsen 1999). However, purported southwestern pre-Clovis occupations at Sandia Cave, the Lucy Site, and Hermit's Cave, all in New Mexico, are not generally accepted (Cordell and McBrinn 2012:108–109). Recently, footprints were uncovered in New Mexico's White Sands National Park that dated to 22,000 years ago (Bennett et al. 2020).

For southwestern Arizona and northern Mexico, Hayden (1976, 1998) revised the Malpais model based on research in the Sierra Pinacate in northern Sonora. In that model, Hayden suggested that a recurrent pattern of sites in a large geographic area of the Southwest could potentially predate Clovis (Heilen 2004:307). Hayden based his model on heavily patinated stone tools and rock arrangements on the ground surface and argued that these were as many as 40,000 years old. However, the artifacts are much like regional Archaic period tools, and the dating of desert varnish on tools is controversial (Ballenger et al. 2017:210).

Paleoindian Period (10,000–7500 B.C.)

Paleoindian groups were highly mobile, following big game, as indicated by kill sites of late Pleistocene megafauna associated with Clovis and Folsom projectile points (Faught and Freeman 1998; Huckell 1984a). The primary trait of the Clovis complex is a distinctive lanceolate spear point with a concave base, longitudinal fluting, and lateral and marginal grinding (Slaughter 1992:7). Several Clovis sites have been recorded in the upper San Pedro River Valley of southeastern Arizona, including AZ FF:9:1(ASM) (formerly known as Naco), AZ EE:12:1(ASM) (formerly known as Lehner Ranch), and AZ EE:8:28(ASM)

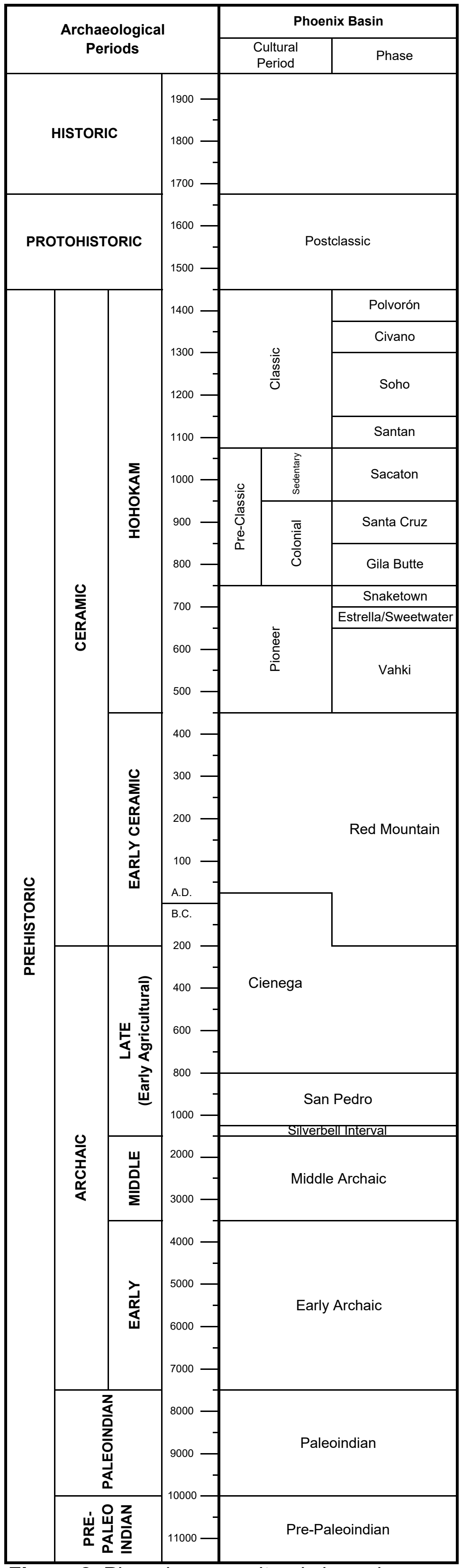

Figure 2. Phoenix area cultural chronology
(Dean 1991; Doyel 1991a; Haury 1976; Henderson 2002; Vint 2018; Wegener and Ciolek-Torrello 2011)

(formerly known as Murray Springs) (Faught and Freeman 1998:41). Elsewhere in Arizona, evidence of the Clovis complex consists mainly of isolated Clovis points, examples of which have been found in the St. Johns and Winslow areas (Faught and Freeman 1998:44; Neily 1985:10), near Safford (Seymour et al. 1997:1–8), near Globe (Johnson and Wasley 1966), and in the Phoenix Basin (North et al. 2005).

The Clovis complex was followed by the Folsom complex (Ballenger et al. 2017). Folsom points are also lanceolate, fluted spear points but with fluting that extends the full length of the blade. In addition, the margins of these points were retouched after fluting. In Arizona, Folsom points have been found only in surface contexts on the Colorado Plateau and in the mountainous Mogollon Rim country (Faught and Freeman 1998:45).

Plainview is a late Pleistocene or early Holocene Paleoindian complex found on the Colorado Plateau and in the southern Basin and Range province. Plainview points and their subtypes include Meserve, Milnesand, and Belen points. All these points resemble Clovis points in their basic configuration but are unfluted (Faught and Freeman 1998:47). A Plainview point was discovered on the bajada of the Winchester Mountains in the Sulphur Springs Valley (Carlson et al. 1989).

In the Phoenix Basin, evidence of a Paleoindian culture has been documented only through isolated finds of projectile points (Crownover 1994; North et al. 2005). Huckell (1984b) and other scholars (Haynes and Huckell 1986; Waters 1986) suggest that Paleoindian sites may have been buried or destroyed by natural geomorphological processes. However, it is also possible that the environment of the Phoenix area was not hospitable to Pleistocene megafauna, making it unattractive to early hunters.

Archaic Period (7500–200 B.C.)

Whether due to climate change, hunting by humans, or a combination of factors, the extinction of the large Pleistocene mammals caused a change from an economy based on hunting large game to one based on collecting a broad spectrum of wild plant foods and hunting small game. Those changes led to what archaeologists call the Archaic period (Whittlesey et al. 2007), a period marked by an increase in the number of archaeological sites in Arizona. Characteristics of the Archaic period include slab-lined storage pits, sleeping circles, a change in projectile point forms, and ground stone tools for the processing of wild seeds (Mabry and Faught 1998). The climate and environment during the Archaic period appear to have been much like they are today. The Archaic in southern Arizona is known as the Cochise culture. Cochise artifacts include projectile points mounted on spears, atlatl darts, and a variety of ground stone tools (Slaughter 1992).

The Archaic is divided into three periods: (1) Early, (2) Middle, and (3) Late. Archaeologists also refer to the Late Archaic as the Late Archaic/Early Agricultural period, making a distinction between whether cultigens were grown or not (Huckell 1995; Mabry 2008).

The Early Archaic period (ca. 7500–3500 B.C.) is not well documented in southern Arizona (Huckell 1984b:137). Early Archaic groups occupied the region but in small numbers (Hall 2018). The material culture during this period was characterized by tapering-stemmed projectile points comparable to Layton's (1979) Great Basin Stemmed series, including Lake Mohave, Jay, and Silver Lake points (Beck and Jones 1997; Huckell 1984b:190); rare ground stone implements, including simple, unshaped-cobble hand stones and grinding slabs; percussion-flaked unifacial tools; and unworked marine shell (Mabry and Stevens 2000). This period is equivalent to the Sulphur Spring stage of the Cochise culture as defined and described by Sayles and Antevs (1941).

Confirmed Early Archaic sites are uncommon in southern Arizona (Mabry and Faught 1998). The deposits at AZ Z:12:5(ASM) (formerly known as Ventana Cave), specifically the Volcanic Debris and Red Sand strata, are perhaps the most well-preserved, studied, and documented Early Archaic materials in southern Arizona (Haury 1975; Huckell and Haynes 2003). Although originally classified differently, it is now recognized from tool forms, projectile point styles, and radiocarbon assays that these strata are attributable to the Early Archaic period (Huckell 1996; Huckell and Haynes 2003; Lorentzen 1998). Artifacts from AZ Z:12:5(ASM) include expedient unifacial scrapers, ovoid and domed scrapers, projectile points (several early styles, including tapering-stemmed), a possible one-handed mano, marine shell, and a bone awl (Haury 1975; Huckell and Haynes 2003).

In the Phoenix Basin, an Early Archaic occupation was found at AZ T:11:94(ASM) near the confluence of the Gila and Salt rivers. Archaeologists discovered two pit structures and an extramural pit on the Blue Point Terrace at the site (Graves et al. 2011; Hall 2018:58). Charcoal from the floor of one of the pit structures returned radiocarbon dates of 5210–4940 cal B.C. and 4540–4400 cal B.C. (Graves et al. 2011:151). Charred wood from the floor of the other structure produced dates of 5040–4800 cal B.C., 5000–4840 cal B.C., and 4960–4720 cal B.C. A more recent date range of 3970–3800 cal B.C. was returned by charcoal from a thermal pit at the site. The findings at AZ T:11:94(ASM) are significant in that they show that Early Archaic period people built habitation sites on preserved early and mid-Holocene alluvial landforms along the Salt River floodplain (Graves et al. 2011:153). Other Early Archaic period sites might be found on other, similar landforms.

An Early Archaic presence was also identified in Tempe. A thermal pit (Feature 14) from the Tempe Depot Project (at the Tempe Historic Townsite – AZ U:9:309[ASM]) was dated to 4120–3550 B.C. through Single Aliquot Regeneration-Optical Stimulated Luminescence (SAR-OSL) dating. A radiocarbon date range of 4681–4493 cal B.C. from charcoal from that same feature suggests that the charcoal was from old wood predating the use of the pit (Hackbarth 2022:91). Radiocarbon dating of combined charcoal from two charcoal concentrations at AZ U:9:309(ASM) returned a date range of 5208–4961 B.C. However, SAR-OSL dates of 3785 ± 260 B.C. and 3935 ± 290 B.C. were obtained for samples taken near the charcoal concentrations (Fertelmes and Hackbarth 2022:569).

The transition to the Middle Archaic period (3500–1500 B.C.) was marked by population shifts in response to the environmental stresses of the Altithermal Interval, a period once coined as the “great drought” (Antevs 1983). Arid desert basins were abandoned, and highlands were increasingly occupied, with populations aggregating near reliable water sources. This hot, dry period peaked around 4000 B.C. (Mabry 1998a), with reliable precipitation and moderately cooler temperatures returning to southern Arizona by 2500 B.C. The number of Middle Archaic sites in southern Arizona reflects an increasing occupation of the region following the Altithermal Interval (Dart 1986; Douglas and Craig 1986; Gregory 1999; Huckell 1984b; Whalen 1975). Middle Archaic period site types include long-term bajada base camps, seasonally occupied bajada camps, floodplain sites, montane hunting camps, small plant- or game-processing sites, rock shelters, and lithic quarry sites.

Although some Middle Archaic period populations were highly mobile, integrating diverse and far-ranging environments into their annual procurement ranges (Shackley 1996), others appear to have been practicing limited patterns of mobility, which Freeman (1999) points to as the early evolutionary stage of Late Archaic period semi-sedentism.

Projectile points diagnostic of the Middle Archaic period consist of San Jose/Pinto, Chiricahua, and Gypsum styles. San Jose/Pinto points have yielded radiocarbon dates ranging from 3900 to 2000 B.C. (Mabry 1998a: 68). The Cortaro point also appears during the Middle Archaic period, but its temporal range includes the Late Archaic period (Gregory 1999; Roth and Huckell 1992). Features from Middle Archaic period sites include basin-shaped hearths, roasting pits, ground stone caches, rock alignments, domestic living surfaces, flexed and extended inhumations, cairn mortuary features, and rock art (Freeman 1999; Huckell 1996:342).

In Phoenix, archaeologists identified a Middle Archaic period occupation at AZ U:5:33(ASM) (formerly known as the Last Ditch Site) (Hall 2018). More than 200 features at the site dated to the Middle Archaic period (Hall 2018; Phillips et al. 2001; Rogge 2011), including two pit structures and numerous thermal pits. Radiocarbon dates from the features clustered around 2900–2300 cal B.C. and 2500–1900 cal B.C. (Hall 2018:59). The Middle Archaic period component of AZ T:7:419(ASM) (formerly known as Falcon Landing) consisted of over 700 features, including house-in-pit-style pit structures (Hall 2018; Hall and Wegener 2017; Wegener and Hall 2017). The site represents intermittent, seasonal occupation over thousands of years. The main activity at the site appears to have been the processing of wild plants, especially mesquite (Hall 2018:59).

The Late Archaic/Early Agricultural period is currently divided into the San Pedro phase (1200–800 B.C.) and the Cienega phase (800 B.C.–A.D. 50). The phase between 1500 and 1200 B.C. has yet to be named, but archaeologists are increasingly referring to the time between the Middle Archaic and the San Pedro phase as the Silverbell Interval (Vint 2017:52; Whittlesey 2015). During the Late Archaic/Early Agricultural period, sedentary agriculture began, at least along the Santa Cruz River in the Tucson Basin (Gregory 1999, 2001; Mabry 1998b; Mabry et al. 1997). Residents of that area constructed pit structures and grew corn. A carbon-14 (14C) date of 3145 ± 50 B.P. was obtained for a maize kernel fragment from AZ AA:12:736(ASM) (formerly known as the Valley Farms Site) (Roth and Ahlstrom 2000). Irrigation agriculture was also being practiced during the Late Archaic/Early Agricultural period (Hesse and Lascaux 2005). It is becoming increasingly evident that Late Archaic/Early Agricultural period populations were more sedentary than archaeologists had previously believed (Doyel and Fish 2000; Gregory 2001; Mabry 1998b; Mabry and Archer 1997). Settlement patterns were expressed in a dichotomy between upland and riverine resource zones, with relatively permanent habitation sites located near water sources and smaller, limited-activity sites located in the uplands (Roth 1992; Whalen 1971). Based on work conducted near the Phoenix Convention Center (AZ T:12:70[ASM] [formerly known as Pueblo Patricio]), Archaic deposits may remain intact within a prehistoric soil horizon developed approximately 3,000 to 4,000 years ago (Hackbarth 2010).

Material culture included ground stone artifacts; flaked stone, bone, and utilitarian items; shell and bone ornaments; and a suite of possible ritual paraphernalia such as fired-clay figurines (Chenault 2016; Stinson 2005), beads, pipes, cornucopia-shaped objects, sherds from small, baseball-shaped bowls, crystals, ground stone disks, and stone trays (Mabry 2008:Table 1.2; Whittlesey et al. 2007). Projectile points included side- or corner-notched San Pedro points and Empire points (Stevens and Sliva 2002).

Archaeologists have investigated Late Archaic/Early Agricultural period components at AZ U:5:33(ASM) (Hall 2018), AZ T:7:419(ASM), and AZ U:11:7(ASM) (formerly known as Finch Camp). The last site was a large, multicomponent, nonriverine site located along the southeastern edge of the Phoenix Basin (Hall 2018; Wegener et al. 2011). Features found at the site included structures, pits, mortuary features, and a reservoir. Archaeologists also recovered some of the earliest utilitarian pottery in the Southwest. Subsistence evidence indicates that the site's occupants gathered wild plants and hunted artiodactyls in the upland zones near the site. This direct access to the uplands is not evident at AZ U:5:33(ASM) (Hall 2018) or AZ T:7:419(ASM) (Wegener and Hall 2017). Existing evidence suggests that Phoenix Basin Archaic populations did not adopt maize agriculture or farming techniques until much later than Archaic period groups in the Tucson Basin (Hall 2018:56).

Early Ceramic Period (200 B.C.–A.D. 450)

The Early Ceramic period in the Phoenix Basin is represented by the Red Mountain phase. Doyel (1991a) and Dean (1991) placed the end of the phase at A.D. 300, but absolute dates (as summarized in Mabry 2000) indicate that the phase continues to A.D. 450. The Red Mountain phase has been suggested as a bridge between the Archaic and the Hohokam cultures (Cable and Doyel 1987), and archaeologists have hypothesized that Late Archaic/Early Agricultural sites in the Tucson Basin led to the Red Mountain phase in the Phoenix area (Mabry 2000:38). Traits of the Red Mountain phase include houses of numerous shapes (Hackbarth 2019; Mabry 2000), flexed inhumation mortuary features, basin metates, large, corner-notched projectile points (Doyel 1991a), clay figurines, and sand-tempered plain brown pottery (Crown 1991b). In the Phoenix Basin, Red Mountain phase components have been identified at AZ U:10:2(ASU) (formerly known as the Red Mountain Site), AZ T:12:70(ASM) (Cable and Doyel 1985, 1987; Hackbarth 2010; Henderson 1995; Morris 1969), AZ U:9:68(ASM) (formerly known as La Cuenca del Sedimento) along the Salt River in modern Tempe (Henderson 1989), AZ U:5:33(ASM) (Hackbarth 2001, 2019), and possibly AZ T:12:69(ASM) (formerly known as Block 39) (Montero and Hackbarth 1992). A large number of Red Mountain phase features were also found at AZ U:11:7(ASM) along the southeastern edge of the Phoenix Basin (Wegener et al. 2011).

Excavations at AZ T:12:70(ASM) for the Phoenix Convention Center Project revealed site structure for the Red Mountain phase that had not been previously identified. The pattern consisted of two contemporaneous houses situated beside each other with both entries facing southeast. Extramural hearths and metates were located in a work area in front of the houses (Hackbarth 2010:219, 2019). Structures dating to the Red Mountain phase exhibit a diversity of house shapes, circular being the most common (Hackbarth 2019:52).

Hohokam (A.D. 450–1450)

The O'Odham people are the lineal descendants of the people whom archaeologists refer to as "Hohokam" and are connected to Hohokam material culture (Loendorf and Lewis 2017), and the Piipaash people are the descendants of the people whom archaeologists refer to as "Patayan" and are connected to Patayan material culture. The O'Odham recognize the Hohokam as *Huhugam. Huhugam* refers to the deceased ancestors and is not the same as the archaeological term *Hohokam* (Archaeology Southwest 2020).

The Hohokam appeared in the archaeological record in what is now central and southern Arizona at about A.D. 450. Once thought to have originated in Mesoamerica (Haury 1976), current evidence indicates that the Hohokam culture was the result of in situ populations developing from an Archaic base (Cable and Doyel 1987; Doyel 1991a; Foster and Woodson 2002:25; Wallace 1997; Wallace et al. 1995; Wilcox 1979) but with strong similarities to northwestern Mexican cultures (Cobb et al. 1999:170; Nelson et al. 2017). Excavations of Early Agricultural period villages have aided in the rethinking of earlier interpretations of the origin of the Hohokam (Doyel and Fish 2000:7). Nevertheless, the Hohokam did share many similarities with cultures to the south, such as figurines, platform mounds, ballcourts, and copper bells (Foster and Woodson 2002:25), and at present there is no consensus as to when or how these traits were adopted by the Hohokam (Kelley 1966; Mathien and McGuire 1986; Nelson 1986; Wilcox 1991a; Wilcox and Sternberg 1983).

The Hohokam regional system once encompassed an area between 73,000 km^2 (Bayman 2001:257) and 80,000 km^2 (Abbott et al. 2007:461) and occupied an extensive portion of central and southern Arizona. Many researchers agree that the core of the Hohokam regional system was the Phoenix Basin. Archaeologists have traditionally divided the Hohokam chronology into two main periods: (1) pre-Classic and (2) Classic. A third period, the post-Classic/Protohistoric period (A.D. 1450–1690) covers the time following the Classic period until the arrival of the Spanish in the Southwest.

Pioneer Period (A.D. 450–750)

The Pioneer period consists of three phases: the Vahki, Estrella/Sweetwater, and Snaketown. During the Vahki phase (A.D. 450–650), two types of structures were built: (1) large, square houses and (2) small, rectangular structures (Cable et al. 1985; Haury 1976). Pithouses throughout the Hohokam Pioneer period in Phoenix (as well as the Colonial and Sedentary periods) were typically of the type referred to as houses in pits (Haury 1976). Ceramics produced during the Vahki phase were manufactured by the paddle-and-anvil and coil-and-scrape methods and consisted of plain brown wares, polished red wares, and red-on-gray wares (Crown 1991a). Ground stone palettes, turquoise mosaics, human figurines, and shell jewelry were all present during the Vahki phase (Cable and Doyel 1987; Gladwin et al. 1937). Exchange systems appear to have been in place during this period, with Neily and Cogswell (2007:8) noting that the “presence of some intrusive elements, including shell and turquoise, at principal settlements such as Snaketown suggests the development of regional interaction patterns.” Mortuary features were primarily inhumations but included cremations in pits or trenches, with cremations becoming dominant by the early Colonial period (Doyel 1991a:239).

Many Hohokam chronologies now combine the Estrella and Sweetwater phases into a single phase (Estrella/Sweetwater phase, A.D. 650–700) (Abbott 2009; Henderson 2002). Differences between Estrella Red-on-gray and Sweetwater Red-on-gray pottery are difficult to discern (Cable and Doyel 1987:42), and these ceramics are often lumped together as Pioneer period gray ware.

Beginning in the Snaketown phase (A.D. 700–750), pithouses increased in size and were square to rectangular in shape. Patterning of house clusters became apparent (Doyel 1991a). Production of buff ware ceramics using the paddle-and-anvil method began in the Snaketown phase. Large-scale irrigation systems were introduced (Wilcox and Shenk 1977), and cremation became the preferred method of interring the deceased. Ground stone palettes, turquoise mosaics, clay figurines, and shell jewelry continued to be produced.

Colonial Period (A.D. 750–950)

The Colonial period follows the Pioneer period and is divided into the Gila Butte (A.D. 750–850) and Santa Cruz (A.D. 850–950) phases. It was during this period that Hohokam influence spread beyond the Phoenix

Basin to northern and southern Arizona. Ballcourts first appeared, possibly reflecting changes to social structure and possibly influenced by Mesoamerica (Doyel 1980, 1991a; Wilcox 1991a, 1991b; Wilcox and Sternberg 1983). These were likely a facilitator for the far-reaching trade that expanded during this era (Abbott et al. 2007). Not all villages had ballcourts, however, suggesting unequal access to ritual behavior along with certain goods and services. Currently, 228 ballcourts are known from 194 sites in the Southwest, with the largest concentration located in the Phoenix Basin (Craig and Woodson 2017:333; Marshall 2001).

Ritual paraphernalia of all kinds increased during the Colonial period. Changes in ritual behavior can also be seen in an increase in the frequency of cremation mortuary features, suggesting a fundamental change in mortuary beliefs. Village size in the Phoenix Basin increased, and new sites were established. Pithouses—mainly of the house in pit variety—were built in clusters, with doorways facing a common, extramural area. Canal systems expanded. Red-on-buff pottery reached an artistic apex during the Santa Cruz phase, with intricate design motifs that included curvilinear scrolls and the portrayal of humans, birds, insects, and quadrupeds. Exchange networks expanded, and material from non-local sources continued to be imported, including shell for ornaments, obsidian and other fine-grained stone for tools, and copper bells (Vargas 1995).

Numerous villages were established throughout the region during the Colonial period (Craig and Woodson 2017), including in peripheral areas along secondary drainages where canal irrigation was not possible or was less substantial than along the Salt and Gila rivers.

Sedentary Period (A.D. 950–1075)

The Sedentary period (A.D. 950–1075) consists of just the Sacaton phase. At one time, archaeologists proposed the Santan phase for the late Sedentary period (Gladwin 1928; Gladwin et al. 1937). And while the Santan phase appears to be increasingly accepted by researchers, most now place it in the early Classic period rather than the Sedentary (Abbott 2023; Doyel 2023:97).

During the Sedentary period, sites became larger, and many villages had communal plazas and ballcourts. Larger villages often had more than one ballcourt (Craig and Woodson 2017:335). There was also an increase in the number of cemeteries at sites, suggesting changing intrasite social boundaries and dynamics wherein smaller social groups consisting of four or five households became the primary social unit (Wilcox and Sternberg 1983:236). Pithouses were larger, with some elliptical and others rectangular in plan. Hohokam canal systems were modified and enlarged to their greatest extent. The Hohokam constructed the largest canal irrigation system in the New World north of Peru. Archaeologists estimate that Hohokam canals could have irrigated up to 70,000 acres (28,000 ha) of agricultural fields (Woodson 2016:4). Individual Hohokam canal systems consisted of groups of canals with a common headgate location (Lyons et al. 2011:375) and irrigated fields and settlements spread alongside the canals (Hunt et al. 2005:440–441). There were numerous canal systems on the Salt River in the Phoenix Basin **(see Figure 3**

below), including four main systems: System 1 and the Lehi System, located south of the Salt River, and System 2 and the Scottsdale System, located north of the river (Abbott et al. 2003:7; Hunt et al. 2005). The Scottsdale System is located within the Salt River Pima-Maricopa Indian Community and is not shown in **Figure 3**. In addition to those four main systems, Howard and Woodson (2018:Figure 7) illustrate two other systems north of the river—the Colinas and Tolleson systems—and three systems south of the river—the Primero, Laveen, and Viejo systems. Caseldine (2020a) identified many more systems, especially south of the Salt River.

During the Sedentary period, the distinctive Gila Shoulder first appeared on some ceramics; however, there was a general drop-off in the quality of pottery manufacturing. Red wares increased in number, and shell etching became widespread. Trade networks continued to flourish (Crown 1991a, 1991b; Doyel 1991a, 1991b), and copper bells, obsidian, marine shell, and non-local ceramics attest to trade with several different cultural groups, including groups from western and northwestern Mexico (Caseldine 2020b; Craig and Woodson 2017), Kayenta and Cibola Pueblo groups, Mountain and Mimbres Mogollon, Dragoon, Trincheras, Yuman, and coastal California groups (Doyel 1991a:252). Ballcourts likely formed the nexus of trade networks. By the end of the Sedentary period, numerous sites were abandoned, and the Hohokam population appears to have congregated in the Phoenix Basin. The ballcourt system ceased to operate during this period, and most ballcourts appear to have fallen out of use by A.D. 1070 (Craig and Woodson 2017:328). Doyel (2023:85) places the start of platform mound construction during the Sedentary period at approximately A.D. 1000.

Classic Period (A.D. 1075–1450)

Doyel (2000) suggested adding the Santan phase to the Hohokam sequence during the Classic period for the period between A.D. 1075 and 1150 rather than to the Sedentary period. Both Doyel (2023:97) and Abbott (2023) place the Santan phase in the early Classic period. This phase is based on changes in settlement patterns, architecture, mortuary patterns, material culture, and ideology. However, no single-component Santan phase site has been identified (Doyel 2000:225), making the identification of traits for this phase problematic. At approximately A.D. 1050 to 1075, several major villages, including AZ U:13:1(ASM) (formerly known as Snaketown) and AZ AA:2:2(ASM) (formerly known as Grewe), were depopulated, and the ballcourt network ceased to operate (Clark and Abbott 2017; Craig and Woodson 2017:340). The reasons for this remain unclear. This depopulation does not appear to have happened at most sites along the Salt River. Occupations shifted locations within the site boundaries over time, but large-scale depopulation is not apparent.

During the Santan phase, residential architecture consisted of pithouses. Public architecture was constructed of post-reinforced adobe walls (Doyel 2000:226) and included vertical-walled, rectangular platform mounds. Santan Red-on-buff jars were short with straight rims, and the design field between the jar body and the jar neck was separated by a wavy line that encircled the neck. Painted designs varied from the red/maroon of Sacaton to the faint red or pink of Casa Grande Red-on-buff (Doyel 2000:228).

The Soho phase (A.D. 1150–1300) marks the beginning of the traditionally recognized Classic period, with red ware ceramics becoming more prevalent than red-on-buff ceramics and inhumations increasingly preferred (Doyel 1974). During the Soho phase, narrow-walled adobe structures were built for the first time (Abbott and Foster 2003:29; Doyel 1981). Houses and mounds were enclosed within adobe-walled compounds. Ballcourts were replaced by large platform mounds topped with elevated rooms (Doyel 1991a; Eighmy and McGuire 1989; Haury 1976). The function of these rooms remains unclear, but they appear to have served a variety of purposes in different contexts, including as elite residences (Wilcox 1991a), ceremonial mounds, and administrative centers (Abbott 2023; Ciolek-Torrello 2023; Rice et al. 2023).

During the Civano phase (A.D. 1300–1375), adobe structures became more common, Salado polychrome ceramics were prevalent, red-on-buff pottery became scarce to non-existent, and inhumations continued to be the most common mortuary treatment (Doyel 1974, 1981). These mortuary features were often placed in rows within cemetery areas (Hackbarth 2012a). There is some evidence that each canal system was controlled by a large village that managed and maintained it as part of a closed community (Abbott 2000). Toward the end of the Classic period, smaller sites were abandoned as the population aggregated into large village centers. This aggregation is thought to be the result of the need for agricultural intensification (Cable and Mitchell 1989), to better administer the water in the canal systems (Gregory and Nials 1985; Nicholas and Neitzel 1984), and to counter the deterioration of the environment (Masse 1991; Weaver 1972). Other explanations include warfare (Doelle and Wallace 1991), migration (Masse 1980; Schroeder 1965, 1966), and a shift in the belief system that had resulted in the change from ballcourts to platform mounds as places of ritual (Wilcox and Sternberg 1983).

Some researchers regard the Polvorón phase (A.D. 1375–1450) as the last phase of the Classic period; others, as post-Classic (Crown and Sires 1984; Sires 1984). Subject to debate (Chenault 1996, 2000; Henderson and Hackbarth 2000), this phase appears to correspond to a decrease in population and a return to pithouses rather than adobe structures (Crown and Sires 1984), although some adobe rooms may have been reused. Courtyard groups appear to have consisted of paired structures (Gregory 1988). Polvorón phase sites exhibit higher frequencies of obsidian and red ware ceramics and a reduction in buff ware ceramics (Doyel 1991a; Sires 1984). Polvorón phase components have been identified at several Phoenix area sites, including AZ U:9:1(ASM) (S’eḏav Va’aki) (formerly known as Pueblo Grande) (Abbott and Foster 2003), AZ T:12:47(ASM) (formerly known as Pueblo Salado) (Chenault 1996), AZ T:12:36(ASM) (formerly known as Casa Buena) (Howard 1988a), and AZ T:12:256(ASM) (formerly known as Grand Canal Ruin) (Cable and Mitchell 1989).

Post-Classic/Protohistoric Period (A.D. 1450–1690)

The date range of the post-Classic/Protohistoric period is much debated in the Southwest (Gilpin and Phillips 1998; Ravesloot and Whittlesey 1987; Wells 2006; Woodson 2002). Consequently, a definitive timeline for the period has yet to be established. Some reasons for this uncertainty are the lack of recognized post-Classic/Protohistoric period sites in the archaeological record and the various times at which the Spanish occupied different portions of the Southwest. (Spanish occupation traditionally marks the beginning of the Historic period.) The Spanish presence in what is now Arizona was established by A.D. 1700. Much of the material culture that is the hallmark of the Hohokam expression has not been well documented by archaeology after A.D. 1450, and post-A.D. 1450 sites are elusive and have not been recognized for what they are. Exceptions to this are found in continuities between Classic period Hohokam projectile points and Historic period O'Odham points (Loendorf 2012, 2014). Although many aspects of material culture and land use changed over time, the Hohokam are considered the lineal ancestors of the modern O'Odham.

During the 250 years between the Prehistoric and Historic periods, major changes occurred in the Phoenix Basin. The large Hohokam villages were replaced by the small homesteads of the O'Odham, and large-scale irrigation was replaced by floodwater and dry-farming agriculture (Wells 2006). Based on the accounts of Spanish explorers such as de Niza, Kino, and Coronado, ethnographic research (Castetter and Bell 1942; Ezell 1983; Russell 1908), and modern archaeological survey and excavations (Gasser et al. 1990; Wells 2006; Woodson 2002), life during this period consisted of self-sufficient, autonomous families living in *ranchería*-style households (Ezell 1983; Gasser et al. 1990; Wells 2006:8). Diagnostic artifacts include "Sobaipuri" projectile points and "Sobaipuri" plain, Pima Plain, Pima Red, and Pima Red-on-buff pottery (Wells 2006). Unifacial tools may have also been important (Brew and Huckell 1987; Masse 1981).

Historic Period (A.D. 1690–1974)

Native Americans

In addition to the O'Odham, who are the lineal descendants of the Hohokam, the Yaqui, Zuni, and Hopi claim association with the prehistoric cultural resources in the Phoenix Basin. There are believed to have been multi-ethnic interactions among the Hohokam, Yuman groups, Hopi, Zuni, and northwestern Mexican groups (Dongoske et al. 1997; Ferguson and Lomaomvaya 1999; Ferguson and Lyons 2003; Fish and Fish 2022:116, 2023; Hill et al. 2015; Nelson et al. 2017; Shaul and Andreson 1989; Shaul and Hill 1998; Teague 2009).

In the mid-1800s, the Akimel O'Odham rebuilt parts of the Hohokam canal systems along the middle Gila River. Yaquis also helped build the canals during the latter part of the 1800s (Fish and Fish 2022:120). Canals in the Phoenix area were constructed with labor provided by members of the Akimel O'Odham, Tohono O'Odham, Piipaash, Yuma, Yaqui, and Apache Tribes (Jones 1960; Jensen et al. 1998; Fish and Fish 2022).

Spanish Exploration and Euroamerican Settlement

Spanish explorers first entered Arizona during Fray Marcos de Niza's 1539 expedition and again the following year during the Coronado expedition. The forces of Spanish colonization, exemplified by the establishment of presidios to secure and control the region, present a unifying and common historical thread that intricately links Arizona, New Mexico, Colorado, and California and contributed significantly to the trajectory of the development of the southwestern United States. Systematic Spanish exploration and documentation of Arizona, however, did not begin until the 1690s. At this time, Spanish explorers reported the presence of small O'Odham and Piipaash communities along the Gila River and within the Phoenix Basin (ASM 2023a; Doyel 1991a:263, 267; Hallenback 1983). Circa 1750, O'Odham communities began growing wheat and other crops in canal- and ditch-irrigated fields along the Gila River (Doyel 1991a:267). From the late 1840s through the late 1860s, the most substantial Native American agricultural communities, named Pima and Maricopa villages by the Spanish, were located approximately 15 miles south of downtown Phoenix, where verdant fields of corn, wheat, pumpkins, and melons were grown and sold to incoming American soldiers, settlers, and travelers (Doyel 1991a:267; Nelson 2020:129). In 1848, the Treaty of Guadalupe Hidalgo brought the future location of the city of Phoenix under the control of the United States, and in 1854 the United States acquired the remaining southern half of Arizona under the Gadsden Purchase. With ownership of the new lands secured, Anglo-American settlers entered the Arizona Territory to prospect for precious minerals, farm, and raise livestock.

The United States Army established Camp McDowell in 1865 along the Verde River, northeast of the future Phoenix townsite, to protect established travel routes from Apache raiding. Camp McDowell required supplies, including hay for livestock and grain for the enlisted men, and in 1867 the U.S. Army contracted John Y. T. Smith to harvest wild hay along the Salt River. Smith hired John William (Jack) Swilling, a former confederate turned Union Army scout, experienced freighter, and entrepreneur, to assist him (Luckingham 2016:13–15; Vandermeer 2012:14). Swilling saw the potential of the Hohokam-constructed network of irrigation canals and ditches along the Salt River and organized the Swilling Irrigation and Canal Company to repurpose them for modern use. Having secured a workforce of 16 miners from Wickenburg, Swilling set to work clearing and repairing the Hohokam canals. With a small field system established, more Anglo-American farmers moved into the valley.

As was typical with most early settlements, individuals and corporations chose to settle near reliable sources of water. The federal government encouraged these settlements through congressional action, including granting “Ditch and Canal Owners” right-of-way across public lands in 1866, followed by the Desert Land Act of 1877, which sought to promote the irrigation of desert lands throughout the West, and finally the passage of the Federal Reclamation Act of 1902 (Steeley and Gilpin n.d.). This act established the Reclamation Service (renamed the Bureau of Reclamation in 1923), which designated the Salt River Valley as a collector for the SRP, one of its first five demonstration projects in the arid West (Steeley and Gilpin n.d.). The largest historical project under this program, which was begun in 1905 and completed in 1911, was the Roosevelt Dam, named after then President Theodore Roosevelt. The dam became one of the chief sources of power and water for Phoenix and helped promote the city’s later development.

Establishment of the Phoenix Townsite

By 1870, approximately 200 people were living in the Salt River Valley and calling for an official townsite. Several locations were suggested, one of which was Swilling’s homestead in eastern Phoenix, but it was John T. Alsap, a Yavapai County representative in the Territorial Legislature, who successfully proposed a small, gridded area bound by the present-day locations of Van Buren Street to the north, railroad tracks to the south, 7th Street to the east, and 7th Avenue to the west (Luckingham 2016:16–19; Vandermeer 2012:15). The early townsite included the first cemetery in Phoenix, established in 1871, located within the confines of present-day city Blocks 57 and 58 (Hackbarth 2013:12–13). The townsite was named Phoenix, a reference to the resurrection of the prehistoric canal systems that furnished the community with water (Luckingham 2016:16–19; Vandermeer 2012:15). The naming of the townsite is credited to Phillip “Lord” Darrell Duppa, an Englishman who established a homestead at what is now 116 W. Sherman Street, just west of 1st Avenue. The first Anglo and Mexican American farmers in Phoenix grew alfalfa, wheat, barley, turnips, beets, onions, potatoes, and lettuce as well as traditional Native American crops like squash and beans. Many of the new Anglo-American settlers, including Adam, Walter, Sawyer, Hoague, Larsen, and Vandermark, in the Salt River Valley had come from the Midwest and East Coast and expressed a desire to “civilize” the desert (Henderson 2016). They began planting ash, poplar, willow, and cottonwood trees, which not only provided shade but an Eastern aesthetic to the growing southwestern town (Vandermeer 2012:16–19).

In the early years of the townsite, because of its isolation and the high cost of shipping, buildings were constructed using locally available materials, primarily adobe and sun-dried clay. Anglo-American Phoenicians and city boosters seeking to promote a more urban image of the community decided to replace the traditional adobe and clay structures with architectural forms that would appeal to Eastern sensibilities. This was achieved in 1879 with the construction of a fired-brick factory and the arrival of the Southern Pacific Railroad in Maricopa, a station 25 miles south of Phoenix from where passengers and freight could continue their trip by wagon road (Garrison et al. 1989:8; Vandermeer 2012:25). In 1886, a spur line between Phoenix and Maricopa was completed, making travel easier and reducing shipping costs for building materials (Luckingham 2016:22; Vandermeer 2012:25). At this time, brick became the preferred building material for new homes, businesses, and schools. The popularity of brick was reinforced by fires that swept through the townsite in 1885 and 1886, leading to a ban on wooden structures in the town center. In 1891, yet another fire damaged many of the adobe buildings that still remained from the earlier decades. Phoenix's Anglo-American residents welcomed new Victorian architectural styles derived from the Eastern United States, including Queen Anne, French Second Empire, and Victorian Eclectic (Vandermeer 2012: 25–27). With many of the original southwestern-style buildings gone, city officials claimed Phoenix as a progressive oasis in the Sonoran Desert filled with Victorian architecture and manicured landscaping. As the community developed, the City Council decided to move the cemetery located at Blocks 57 and 58 to free up land for residential, commercial, and warehouse spaces. This removal was declared complete in 1887, with the burials reinterred near the present-day Pioneer and Military Memorial Park at Neahr's Addition along Fourteenth Avenue and Jefferson Street (Hackbarth 2013:12–13). In 2012, Logan Simpson Design (LSD) conducted archaeological data recovery in Block 58 in preparation for anticipated construction. Following data recovery, in 2013, historical graves that had been missed during the relocation of the cemetery in the nineteenth century were encountered during construction monitoring and were documented and recovered by LSD (Sticha 2013).

Ethnic Communities in Phoenix

The ethnic makeup of Phoenix in the nineteenth century was roughly split between Anglo-Americans and Mexican Americans but also included small Chinese, African American, and Native American enclaves (Vandermeer 2012:24). In 1890, approximately 200 Chinese men lived in an area bounded by Madison, Jefferson, and Second streets (Luckingham 2016:34). The earliest African American community in Phoenix was located in the area bounded by Van Buren to the north, the Southern Pacific to the south, Central Avenue to the west, and 24th Street to the east (Dean and Reynolds 2004:33). Later, in the early twentieth century, additional African American communities formed south of Grant and north of the Salt River between 7th and 19th avenues and south of the Salt River and north of Southern Avenue between 16th and 28th streets (Dean and Reynolds 2004). During the Great Depression of the 1930s, Phoenix's African American population increased rapidly as both urban and rural people left the eastern states looking for work. A new subdivision for African Americans was developed in 1931 on east Jefferson Street between 19th and 20th streets (Dean and Reynolds 2004:33). Between the 1930s and 1960s, *The Negro Motorist Green-Book* was published to help African Americans find safe lodging, services, and entertainment across America, including in Phoenix. The safe locations advertised in the Green Book clustered in and around these African American neighborhoods (Library of Congress 2023).

In 1878, members of the Church of Jesus Christ of Latter-day Saints (Latter-day Saints) from Idaho and Utah established Mesa City to the east of Phoenix. The community was officially incorporated as Mesa in 1883, and like their Phoenician neighbors, the Latter-day Saints farmers used the prehistoric Hohokam canal systems to irrigate their fields (Luckingham 2016:22). Native Americans generally did not live in the city prior to the construction of the Phoenix Indian School. While the O'Odham and Piipaash communities to the south had once traded with Anglo-American settlers, tensions rose during the 1870s as Anglo-Americans accused the Native American communities of trespassing in their fields and stealing crops and cattle. Despite the accusations, Anglo-American flour mill operators in Phoenix readily purchased grain from O'Odham and Piipaash farmers, and throughout the 1880s O'Odham and Piipaash came to Phoenix to sell surplus crops, wheat, and firewood and purchase Anglo-American-manufactured goods and textiles. Many Anglo-American Phoenicians complained that the O'Odham and Piipaash people visiting the city were disorderly, prompting the city in 1881 to pass an ordinance making it illegal for any Native Americans to remain in the city overnight and stipulating a dress code for city visitors (Luckingham 2016:33; Trennert 1993:55). Whereas the daily O'Odham visitors were regarded as somewhat of a nuisance by many Anglo-American Phoenicians, the Latter-day Saints of Mesa readily welcomed Native American visitation as they could not legally proselytize on the reservations (Trennert 1993:54–55).

The relationship between Phoenix Anglo-Americans and Native Americans changed when the Phoenix Indian School opened in September 1891, with 41 O'Odham and Piipaash boys in attendance. The school was situated just 2 miles north of the city proper. Phoenicians welcomed the new school for the federal funding that benefited the local economy as well as the inexpensive, part-time labor that the students provided to the community. Although the economic benefits of the school made Anglo-American Phoenicians more accepting of their Native American neighbors, little consideration was given to the impacts the school had on the lives of those in attendance. (In 1996, Professor Dorothy Parker chronicled the history of the school, including an oral history component; however, a Tribal perspective on the school has not yet been published.) As enrollment in the school expanded, the old city sundown ordinance was no longer enforced, and Phoenix's Native American population grew throughout the twentieth century (Bauer and Rogge 1998:3; Trennert 1993:55–57).

During late nineteenth and early twentieth centuries, an increased number of Yoemem or Yaqui people began moving into Arizona to escape the violence of Mexican President Porfirio Díaz's regime and the Mexican Revolution (Spicer 1997). Many of them recognized the opportunities available working in farming, ranching, or for irrigation companies. One of the largest employers of Yaqui people in the Phoenix area was the Salt River Valley Water Users' Association, which employed them to construct and maintain irrigation canals until the 1950s, when mechanization replaced manual labor (Hoerig 2022). By 1936, Yaqui laborers made up an estimated seven percent of Arizona's agricultural workforce (Hoerig 2022). Although most Yaqui within the Salt River Valley settled at the community of Guadalupe located between present-day Phoenix and Tempe, smaller, unnamed enclaves in Phoenix and adjacent areas in South Mountain were established by the Yaqui (Hoerig 2022).

City Growth at the Turn of the Twentieth Century

With improved railroad transportation, tourists began to arrive in Phoenix in the 1890s. In the twentieth century, Arizona became popularly known for its “five Cs,” referencing the state’s strong economy in copper, cattle, cotton, and citrus as well as its attractive climate. At the turn of the century, city officials promoted Phoenix for its warm climate and garden-like atmosphere and used Indian motifs to appeal to eastern tourists. Tourists enjoyed interacting with Native American visitors to the city and happily purchased their tourist market crafts and replicas of ancient artifacts. Recognizing the potential tourism revenue, the City began sponsoring Native American parades and carnivals to attract more visitors. Throughout the first half of the twentieth century, guest ranches and resort hotels cropped up in the city and its vicinity (Trennert 1993:60). Phoenix was also promoted as a reprieve for people suffering from lung ailments, including tuberculosis, asthma, hay fever, and bronchitis. Further, city boosters advertised the climate as preventing other illnesses like typhoid and malaria (Vandermeer 2012:33–34). The advertising of Phoenix as a Southwestern mecca for health was perhaps too successful, and city hospitals and philanthropic organizations found themselves overwhelmed by the number of tubercular and pulmonary disease patients seeking care, many of whom were living in tent camps. To respond to these concerns, Phoenix women’s organizations operated charities that helped those with tuberculosis find care and aid in the city. By 1903, the number of ill and unemployed seeking reprieve had become a nuisance to locals, and in an attempt to reduce vagrancy, the city banned the use of tents within the city limits. This policy pushed the indigent ill outside the city limits to form new enclaves in Cave Creek and Sunnyslope (Lykes 1993; Vandermeer 2012:34). With slow and steady population growth due to tourism, boosterism, and health seekers, people began to settle in significant numbers outside the incorporated city limits.

As Phoenix expanded, the earliest residential suburbs were constructed within walking distance and adjacent to the original townsite (Vandermeer 2012:48). In 1887, a new streetcar system allowed residents to easily commute from home to work. The first streetcars in Phoenix were pulled by horses or mules, but by 1893 electric trolleys provided transportation around the city (Desert Archaeology 2013:12; Luckingham 2016:31). In the second decade of the twentieth century, automobiles became popular, and by the 1920s this newly found mobility helped to expand the business district in downtown Phoenix, with people traveling from the farther-flung communities of Tempe and Mesa to shop at both local and national chain department stores (Vandermeer 2012:42–48). While stately, Victorian-style homes had been fashionable in downtown Phoenix during the nineteenth century, in the 1920s more affordable craftsman-style homes proved to be cooler during the summer months and quickly became popular in the neighborhoods established away from the central business district (Vandermeer 2012:50). City growth came to a brief pause during the

Depression years but quickly resumed by the mid- to late 1930s, with new neighborhoods expanding past the extent of the streetcar lines following the paths of the Grand and Arizona canals. These new suburbs were advertised for their locations near picturesque orchards and resorts and relied on gravel and unpaved automobile roads to connect residents to the city (Vandermeer 2012:51).

Phoenix during the Great Depression

During the Great Depression (1929–1939), a series of public works projects were enacted under the New Deal signed into law by President Franklin D. Roosevelt in 1933. Phoenix’s diverse economy coupled with federal New Deal-era assistance programs spared the city from some of the economic devastation felt elsewhere throughout the country (Vandermeer 2012:79). After 1933, a number of federal offices were established in the city, and the Public Works Administration, Civilian Conservation Corps (CCC), Works Progress Administration, and various agricultural programs were operating in Phoenix and its vicinity (Vandermeer 2012:80). These New Deal programs allowed Phoenix to rebound relatively quickly compared to other areas of the country. For example, through these programs, the COP was able to expand and improve public roads and utilities, construct new recreational areas, improve access to medical services, and employ over 6,000 people throughout the decade.

With limited recreational spaces prior to the New Deal, city parks established under New Deal programs and city bonds were a significant development for Phoenix. Throughout the decade, existing parks were improved, and new parks were constructed. In addition, places that had been unofficially used by Phoenix residents for outdoor recreation became official parks. These included Vainom Do'ag (Piestewa Peak/ Phoenix Mountain Preserve), Papago Park, and South Mountain Park (Jones and Gregory 2017:8).

Prior to the 1930s, the Phoenix Mountains were mostly undeveloped, with the exception of modest mineral prospecting and grazing allotments around Vainom Do'ag. The scenic vistas attracted local hikers and recreationalists, and in 1929 the Biltmore Resort opened on the mountain’s southern slope. Throughout the 1930s, horseback riding and hiking trails took form organically; however, most of the development of the features at Vainom Do'ag occurred later, in the 1960s and 1970s (Jones and Gregory 2017:11–15).

Papago Park had initially been slated for National Monument designation in 1914. That monument status was abolished by the National Park Service in 1930, and the majority of the land was transferred to the state. Soon after acquiring the property, the state constructed a fish hatchery and eight lakes. In 1933, a CCC camp was established at the park. CCC workers constructed a boat house and docks for the lakes, an amphitheater, ramadas, a water-distribution system, erosion-control features, trails, and an additional lake (Jones and Gregory 2017:10).

South Mountain Park, formerly known as Phoenix Mountain Park, had been acquired by the COP just prior to the start of the Great Depression. At the time, it consisted of a few unimproved roads and undeveloped desert. Between 1933 and 1942, two CCC camps were established on the park grounds, and CCC workers constructed hiking trails, park facilities, and formal recreation areas and improved access roads throughout the park (Jones and Gregory 2017:9).

With the inception of the federal relief programs, people from harder hit areas of the country began relocating to Phoenix with the promise of employment, and by the 1940s the city's population had increased by 36 percent (Luckingham 1981:210; Vandermeer 2012:80). This growth continued throughout World War II and the post-war years when Phoenix and its suburbs rapidly expanded and new economic industries in defense and technology emerged for the first time.

Phoenix during World War II

In the 1940s, military installations and defense industries began establishing their operations in Phoenix. Three army camps and six airbases were constructed in the vicinity of the city, including a prisoner-of-war camp for German and Italian prisoners called Camp Papago Park for its location at Papago Park in eastern Phoenix (Luckingham 1981:216; Martinelli 1993:76). The Salt River Valley was chosen by the military for its abundance of flat ground, open space, low winds, good visibility, and relatively good flying conditions. The favorable setting attracted not only the military but private companies as well, and pilots from around the world came to train at airfields near Phoenix and Mesa (Vandermeer 2012:100). In the summer of 1941, the Goodyear Aircraft Corporation began construction of a plant west of Phoenix near Litchfield Park that produced airplane parts for the defense industry (Schilling et al. 2010). Two years later, in 1943, the Litchfield Naval Air Facility was opened and functioned as a test flight facility for Goodyear-manufactured planes. The small town of Goodyear sprang up around the airpark and manufacturing plant, and the COP improved transportation systems to the community, adding bus lines for Phoenix residents who chose to commute (Luckingham 1981). After 25 years of military service, the COP purchased the airfield in 1968, using it as an alternative to the larger Sky Harbor Airport. The airport facilities were updated in 1986, and it remains in use as the Goodyear Airport to this day (City of Goodyear 2024). In 2009, the airport was recorded as an archaeological site, AZ T:11:190(ASM), demonstrating the importance of World War II aviation and the defense industry in the history of Phoenix (Schilling et al. 2010).

In addition to the Goodyear plant west of the city, other defense plants were constructed in Phoenix, including AiResearch and the Aluminum Corporation of America (Luckingham 1981:216). During the war years, city leaders in Phoenix had successfully courted the United States military, offering large, low-cost land leases and quickly arranging utility services and railroad lines to the military-leased lands. Together, these defense plants, airfields, and army camps provided an influx of millions of dollars to the Phoenix economy (Luckingham 1981:216; Vandermeer 2012:101). Following the military boom, Phoenix civic leaders saw the economic potential in technology and manufacturing during the 1940s and, similar to the earlier military contracts, successfully recruited large, established clean industry companies to the city in the post-war decades.

Post-war Developments

Following the conclusion of World War II, road construction, improvement of air travel, air conditioning, and steady economic growth contributed to the development of the city. Phoenix may have gotten its start as an agricultural community, but by the 1950s manufacturing became the fastest-growing and most lucrative economic sector. Aviation and electronics were the largest manufacturing subindustries, followed by the production of machinery, metal fabrication, furniture, clothing, air conditioners and evaporative coolers, radio components, and building materials (Vandermeer 2012:155–157). To encourage these industries in the valley, city leaders provided tax incentives to manufacturers, improved shipping and transportation infrastructure, and actively recruited desirable electronics manufacturers (Luckingham 1981:219–220). During the mid-twentieth century, agriculture became the second most important economic activity in Phoenix, followed by the completion of the interstate highway system, improvement and paving of local roads and highways, and expansion of the airports and air travel, helping to make tourism the third most significant economic driver. The Deer Valley Airport was constructed in 1960 as a private airfield located approximately 20 miles north of downtown Phoenix. The facility was later purchased by the COP in 1971 and expanded over the subsequent years to accommodate increased traffic, including public, private, corporate, and Phoenix Police Department aircraft (COP 2015; Phoenix Deer Valley Airport 2024). With post-war improvements underway, many manufacturers chose to locate their plants in Phoenix, hoping the climate and location would attract skilled and desirable employees (Luckingham 1981:219; McCauley 1993:197–199; Vandermeer 2012:160–161). Indeed, with high-wage manufacturing jobs and the increasing availability of evaporative coolers and air conditioners, many Americans relocated to Phoenix, stimulating a rapid post-war expansion and housing boom. Suburban development in the mid-twentieth century significantly departed from pre-war residential forms with the rise of the master-planned community, the single-story ranch-style home, and mass production.

Between 1940 and 1960, the population of Phoenix skyrocketed from roughly 65,000 to over 439,000 residents. The original townsite from 1870 had encompassed only a modest 0.5 square mile, increasing to 9.6 square miles before World War II. In the 1950s, the COP began an extensive campaign of annexing nearby unincorporated communities. City officials claimed they could provide inexpensive utilities, fix roads, increase recreational resources, and improve police, fire, and sanitation services for annexed areas. Throughout the 1950s and 1960s, the COP annexed the nearby suburbs of Sunnyslope, Maryvale, and South Phoenix, increasing the incorporated area to just over 187 square miles (Luckingham 1981:224–227; Vandermeer 2012:171–180). Although some urban planners derisively described Phoenix as sprawling, housing construction during the post-war years attracted many people who were happy to leave behind deteriorating, high-density urban areas for new, low-density suburban developments. After the 1950s, residential construction frequently used prefabricated components that could be produced off site and quickly installed for mass-produced and inexpensive housing. This new method of production created subdivisions of varying sizes, ranging anywhere from 30 to 400 homes, all produced by a single builder. Single-level ranch-style homes characterized by simple rectangular plans and low-pitched roofs were inexpensive to produce and quickly became the most popular housing form in the mid-twentieth century. Overall, thanks to mass production, Phoenix homes were significantly more affordable than other similar communities across the country, making the city an attractive place for newcomers (Luckingham 1981:230; Vandermeer 2012:193–206). The availability of jobs and housing has continued to attract new residents to the city. Today, Phoenix is the fifth largest city in the United States.

Between the nineteenth and twenty-first centuries, Phoenix grew from a small farming community to a large metropolis with a diverse economy based on agriculture, technology, manufacturing, defense, and tourism. The original townsite that had once been characterized by a small, 0.5-square-mile grid of modest adobe, clay, and wood-frame buildings is now part of a lively downtown business and entertainment district set amidst an incorporated area of just over 500 square miles.

ARCHAEOLOGICAL RESOURCES OF THE CITY OF PHOENIX

This section identifies the types of archaeological resources known to be present in the COP **(Figure 3)**. These include large village sites, hamlets, farmsteads, field houses, canals, and historical homesteads as well as above-ground finds like surface artifact scatters, trash dumps, rock features (e.g., rock piles, shrines, and agricultural terraces), and petroglyphs in as yet undeveloped areas of Phoenix (e.g., in proximity to [north] State Route [SR] 101 and SR 303) and in the city's parks and preserves (South Mountain Park and Preserve, Phoenix Mountain Preserve [Camelback, Papago, and Vainom Do'ag], Deem Hills Recreation Area, North Mountain Preserve, and Phoenix Sonoran Desert Preserve).

Prehistoric Resources

Artifact Scatters

Artifact scatters are highly variable in size, formation, subsurface composition, and artifact density and variation. These are manifestations of many prehistoric and historical activities, including resource procurement, resource processing, and limited to substantial occupation.

Field Houses

Field houses represent short-term camps occupied by a limited number of individuals during parts of the growing and harvest seasons to tend to agricultural fields. These sites are usually small with a considerable variation in architecture, little depth of deposits, and a lack of cemeteries (Crown 1983).

Farmsteads

Farmsteads are interpreted as agricultural-focused habitation sites occupied by a full household unit for the entire growing season (Rice 2001). These sites represent a longer occupation duration than field houses as seen in the more substantial and formalized architecture, planned site plans, deeper middens, and the occasional cemetery.

Hamlets

Hamlets are sites that were inhabited throughout the year with populations somewhat less than 100 individuals (Gregory 1991:162). These sites usually consist of two or more contemporaneous house clusters with associated features such as middens, agricultural systems, and cremation areas.

Villages

Villages are the largest and most complex sites encountered in the Phoenix Basin (Gregory 1991:162). Occupation was continuous over long periods of time. Populations at villages were greater than at other sites, and communal architecture such as ballcourts and platform mounds is common.

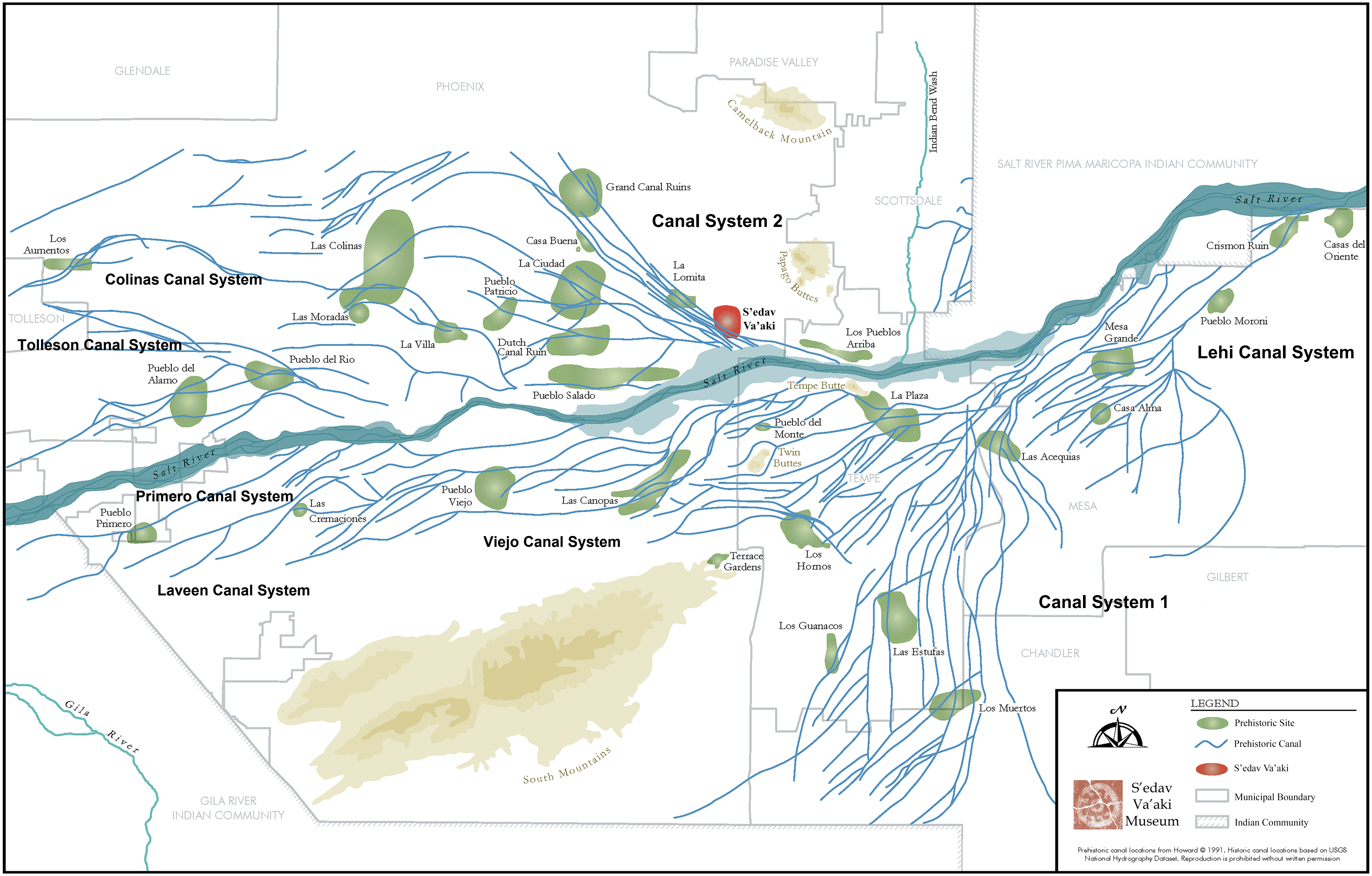

Figure 3. Schematic representation of prehistoric cultural resource sites and canals in Phoenix

Canals

The Phoenix Basin is renowned for its prehistoric canals. These intricate and extensive systems diverted water from the Salt River and show a high degree of engineering and social management (Howard 2006). The SHPO has issued a determination of eligibility indicating that the entire prehistoric canal system is eligible for listing in the A/NRHP under Criterion (d) (Leonard [SHPO] to Yedlin [FHWA], July 22, 2022).

Rock Features

Rock features are a highly variable category that includes many feature types. Thermal and agricultural features (e.g., checkdams and mulch piles), rock rings, cairns, shrines, trail markers, dancing circles, terraces, and intaglios are all examples of rock features.

Petroglyphs and Pictographs

Rock art in the Phoenix Basin consists primarily of Gila-style petroglyphs, including geomorphic and representational glyphs (Schaafsma 1980:86–88). Gila-style petroglyphs consist mainly of lifeforms and geometric designs and correspond with Style 2 iconography (Wright 2014:63). Rock art sites tend to be located at open areas near habitation sites and agricultural fields.

Trails

Trails are worn paths linking sites, resources, people, and places across a landscape and show a pattern of connections within a region (Brown and Stone 1982). In addition to the paths themselves, trails are often associated with rock piles/markers, shrines, and rock art.

Shrines

Shrines are places of power and reverence (Wright 2014:76–79).

Hilltop Sites

Hilltop sites are archaeological sites located on hilltops that possibly served as defensive locations. Alternatively, they may have been used as astronomical observatories. These sites often have masonry walls in various forms. Many archaeologists believe that hilltop sites played a different role in the settlement system than habitation sites, and although similar feature types (such as structures) may be found at hilltop sites, a difference in function makes these sites and features distinct.

Rock Shelters

Natural rock overhangs and shallow caves were often inhabited prehistorically and were used seasonally or for limited activities. These sites may also have been used during the Protohistoric or Historic period.

Major Prehistoric Archaeological Sites in Phoenix

The following section presents brief descriptions of some of the major archaeological sites in Phoenix. This list is not comprehensive, and the sites discussed were selected because they have undergone significant data recovery and/or because they represent Hohokam villages that likely played a significant role in the prehistoric settlement of the Phoenix area.

AZ U:5:33(ASM) (formerly known as the Last Ditch Site)

AZ U:5:33(ASM) is a Middle and Late Archaic period site located on the middle-to-lower bajada slope of the McDowell Mountains. Its setting is the Arizona upland biotic community, replete with cacti and desert shrubs (Hall 2018). Work was conducted at the site by Northland Research, Inc. (Hackbarth 1998, 2001), Archaeological Consulting Services, Ltd. (Phillips et al. 2001), and URS Corporation (Rogge 2011) for improvements to SR 101 and Mayo Boulevard. More than 200 features were attributed to the Middle Archaic period, including two structures, a possible midden, oxidized use-surfaces, hearths, ash stains, and thermal pits. Data indicate that the inhabitants of the site were involved in the gathering and processing of native plant resources during the spring and late summer and early fall, including mesquite, cacti, cheno-ams, wild gourds, and mustard. The Late Archaic period component of the site was smaller than the Middle Archaic component, but the inhabitants were using the same native plant resources (Hall 2018:59).

AZ T:12:1(ASM) (formerly known as La Ciudad)

AZ T:12:1(ASM) (formerly known as La Ciudad) is a large Hohokam village located north of the Salt River midway along Canal System 2. The village was occupied throughout the pre-Classic and Classic periods, and the core of the village consisted of a plaza, a ballcourt, compounds, house clusters, cemeteries, and numerous trash mounds (Lindeman 2019a; Rice 1987 [ed.]).

Significant archaeological investigations were conducted in the northern part of the village complex by the Office of Cultural Resource Management at Arizona State University from 1982 through 1983 (Henderson 1987; Rice 1987, 1987 [ed.]). This work resulted in the excavation of over 200 pithouses and numerous trash pits, surfaces, hornos, pit features, and mortuary features (Henderson 1987).

Early work was done at the site by Eric Schmidt in 1925 and in the 1920s and 1930s by Frank Midvale, who mapped the core of the village (Wilcox 1987). These excavations focused on Mound A and Mound B. Mound A was a very tall platform mound standing as much as 5 m in height. Less documentation is available for Mound B, but it may have stood as high as Mound A (Lindeman 2019a:11).

In 2019 and the early 2020s, archaeological data recovery prior to the development of the Edison Eastlake Community recorded thousands of prehistoric features. In the Roosevelt Street parcel, 116 features, including 21 pithouses, were identified. These dated to the Santa Cruz and early Sacaton phases

(Lindeman 2019b). In the Harmony Area 1 parcel, archaeologists recorded 710 features, including 158 pithouses and 213 mortuary features (Lindeman 2021a). These were attributed to the Gila Butte through Sacaton phase, with some features dating to the Classic period. In the Harmony 2 parcel, 1,264 features were found, 204 of them pithouses as well as 486 mortuary features. These also dated from the early Colonial to Classic period (Lindeman 2021b). Archaeologists found 1,306 features in the Harmony 3 parcel, including 172 pithouses and 429 mortuary features. These dated to the Colonial to Classic period as well (Lindeman 2021c).

AZ T:12:3(ASM) (formerly known as Las Moradas)

AZ T:12:3(ASM) (formerly known as Las Moradas) is a large pre-Classic period village site. Most of the site area is currently covered by modern development. However, cultural features (including pithouses and mortuary features) may still be preserved below parking lots and other shallow disturbances.

The site was originally recorded by Frank Midvale in 1936 and re-recorded by Kelly Schroeder (1995), who obtained the ASM site number. A site card from the S'eḏav Va'aki Museum (AZ T:12:20[PG]) states that a cremation was recovered from private property two blocks west of Yunya Park, where Schroeder did his monitoring (Schroeder 1995). Schroeder identified a trash deposit with ceramics from the Gila Butte through Sacaton phase and also found some flaked and ground stone artifacts. Archaeologists from EcoPlan performed monitoring for a waterline between 33rd and 27th avenues, finding a few artifacts, mainly plain ware sherds (Heilman et al. 2008).

WestLand conducted testing and data recovery at a portion of the site in 2020. Activities included digging test units in a prehistoric trash deposit and excavating four extramural pit features (Charest 2021).

Please note, AZ T:12:3(ASM) is very close to the boundary of AZ T:12:10(ASM) (formerly known as Las Colinas; see below) and may be a portion of that site. However, at the time of the writing of this HPTP, the two were still recorded as separate sites.

AZ T:12:10(ASM) (formerly known as Las Colinas)

AZ T:12:10(ASM) is a very large village site dating primarily to the Classic period. Early investigators such as Fewkes, Turney, and Midvale noted that the site covered between 1.3 and 1.9 square miles and that 12 mounds were once present, at least four of which had been platform mounds. The other mounds were probably trash mounds or the remains of collapsed compounds and rooms (Heathington and Gregory 1985:1). AZ T:12:10(ASM) was located at the end of Canal System 2, one of the largest of the Hohokam canal systems.

In 1968, the ASM performed archaeological excavations at Mound 8 and the mound precinct. Approximately 22 habitation structures, both pithouses and adobe-walled structures, were investigated. Excavations also revealed a massive, solid adobe wall and four separate layers of adobe capping the top of the platform mound (Hammack and Sullivan 1981).

The former Cultural Resource Management Division of the ASM conducted excavations at the site from 1982 through 1984. The work was sponsored by the Arizona Department of Transportation (ADOT) and FHWA prior to the construction of a portion of Interstate Highway 10 (I-10). The project resulted in the excavation or sampling of more than 150 houses, several hundred pits, numerous mortuary features, a ballcourt, and 6 canal segments. In addition, 22 structures and associated intramural features, postholes, wall segments (not directly associated with the mound construction), mortuary features, extramural hearths and firepits, puddling pits, and structural components of the mound itself were excavated within the Mound 8 precinct previously investigated by Hammack and Sullivan in 1981 (Gregory et al. 1988).

AZ T:12:36(ASM) (formerly known as Casa Buena)

AZ T:12:36(ASM) was an important Classic period Hohokam village within Canal System 2. Along with numerous habitation features, the site contained public architecture in the form of a platform mound.

Excavations by Soil Systems, Inc., in the 1980s found a large residential area containing the remains of houses dating from the early Soho through the late Civano phase and possibly into the Polvorón. The site also had a cemetery containing 57 individuals. The work was sponsored by the COP Engineering Department to resolve adverse effects to the site from the construction of Arizona State Route 51 (Howard 1988 [ed.]).

The report for the Soil Systems data recovery project contains an important study of the morphology and function of earth ovens (or hornos). The horno typology presented in the report is still widely used by archaeologists working in the Hohokam region (Howard 1988b).

AZ T:12:47(ASM) (formerly known as Pueblo Salado)

AZ T:12:47(ASM) was a Classic period Hohokam village. During the Civano phase, populations that had been living in hamlets along the alignments of Canal Salado and its northern branch aggregated into a compound (Area 8/9—located in the central part of the western half of the site) that consisted of as many as nine courtyard groups. Chronometric data supported an occupational range of A.D. 1300 to 1500 or later. The compound at AZ T:12:47(ASM) measured approximately 85 by 80 m and was oriented slightly west of north-south (Greenwald et al. 1995).

SWCA, Inc., Environmental Consultants (SWCA) conducted data recovery at AZ T:12:47(ASM) from October 1990 through January 1991 (Greenwald et al. 1995). Excavations focused on Area 8/9 (Chenault et al. 1995), with more limited work performed in Area 14 (in the northwestern corner of the site) (Zyniecki and McQuestion 1995) and Area 20 (in the northeastern part of the western half of the site) (Greenwald 1995). SWCA returned to AZ T:12:47(ASM) between 1992 and 1995 and conducted data recovery in

Areas 6, 15, and 16 (in the eastern half of the site). Excavations revealed that during the Soho phase, Area 6 consisted of field houses and house clusters. During the Civano phase, the locus developed into a habitation area consisting of large adobe-walled structures and a compound. Area 15 was a small farmstead with seven habitation structures, and Area 16 was a cluster of four extramural pits (Greenwald et al. 1996). The SWCA excavations also identified Polvorón phase and Protohistoric period site components as well as some very shallow archaeological deposits (Bostwick et al. 1996:447). They recommended that future studies in undisturbed locations of the site address the continuum of Hohokam to O'Odham occupation. Any archaeological work proposed for AZ T:12:47(ASM) must consider this information, and the field methods and research questions must be structured accordingly.

AZ T:12:52(ASM) (formerly known as Pueblo del Alamo)

AZ T:12:52(ASM) (formerly known as Pueblo del Alamo) consists of the remains of a large Hohokam village with a previously reported but now destroyed platform mound and possible canal segments. The site is located approximately 1 mile north of the Salt River and 7 miles northeast of the confluence of the Salt and Gila rivers on the broad, open valley floor of the Phoenix Basin. The site contains both pre-Classic and Classic period Hohokam components.

The site was first officially recorded in 1928 by archaeologists from Gila Pueblo as Site Phx 1.3 (Gladwin and Gladwin 1929). The Gila Pueblo site card states that the site consisted of a single-story adobe pueblo made up of at least two compounds as well as numerous trash mounds located at the southeastern corner of Lower Buckeye Road and 59th Avenue (Brodbeck 2015:49).

Throughout the decades since it was first recorded, AZ T:12:52(ASM) has suffered extensive impacts from historical and modern agriculture. Nevertheless, large portions of the site have been tested and excavated (Chenault and Greenwald 1990; Hohmann 2003a, 2003b, 2007; Hohmann et al. 2009a, 2009b), partly due to the construction of ADOT's Loop-202 South Mountain Freeway and related economic development (Charest and Chenault 2019; Hall 2020). WestLand conducted extensive data recovery at AZ T:12:52(ASM) for the South Mountain Freeway Project, finding numerous pithouses, hornos, roasting pits, and other pit features and encountering several hundred mortuary features (Chenault 2017, 2018, 2021). The site dates from the Pioneer through Classic period.

AZ T:12:70(ASM) (formerly known as Pueblo Patricio)

AZ T:12:70(ASM) was a large Hohokam village. Frank Midvale mapped the site in the 1920s, depicting it as having a platform mound, habitation areas, and a large canal.

Since the early 1980s, there have been many large-scale archaeological investigations at the site, several of which have been sponsored by the COP (Rayle and Walsh 2012:15). More than 350 prehistoric features have been encountered in various portions of the site, including structures, surfaces, thermal and non-thermal pits, postholes, and mortuary features, as well as numerous canal segments (Cable et al. 1982, 1983, 1984, 1985; Cox and Rogge 2004; Hackbarth 2009; Henderson 1995; Jackman et al. 1999; Montero and Hackbarth 1992; Sorrell 2008; Stone 1981). The site was occupied from the Red Mountain (Hackbarth 2010:200) through the Civano phase (Hackbarth 2012b).

AZ T:12:148(ASM) (formerly known as La Villa)

The Hohokam village of AZ T:12:148(ASM) (formerly known as La Villa) was one of the largest pre-Classic settlements in the Phoenix area. Although Midvale originally mapped a possible compound at the site, available excavation data suggest that AZ T:12:148(ASM) was occupied from the Red Mountain and Vahki phases through the Santa Cruz phase and was abandoned in the eleventh century. Desert Archaeology conducted two excavation projects at the site. Those excavations recorded hundreds of features, including pithouses, extramural features, mortuary features, and two plazas (Lindeman 2015, 2016).

Another portion of the site was excavated in 2003 by archaeologists from Northland Research, Inc. That effort resulted in the encounter of 348 cultural features, including pithouses, mortuary features, extramural pits, hornos, and midden deposits (Craig 2005).

AZ T:12:256(ASM) (formerly known as Grand Canal Ruin)

The village of AZ T:12:256(ASM) is a large Classic period site. Data recovery was conducted at the site in 1986 by Soil Systems as part of the Arizona State Route 51 Project. Archaeologists found over 200 features in the portion of the site investigated, including houses, hornos, midden deposits, canals, and a cemetery. Architectural features included pithouses, adobe-walled structures, and an adobe compound. Excavators recovered over 100 mortuary features. The site was occupied early in the Classic period, and occupation continued through the Soho, Civano, and Polvorón phases. AZ T:12:256(ASM) was the northernmost settlement within Canal System 2 (Mitchell 1989).

AZ U:9:1(ASM) – S'eḏav Va'aki (formerly known as Pueblo Grande)

The village of AZ U:9:1(ASM) (S'eḏav Va'aki) was one of the largest Hohokam settlements in the Phoenix Basin. It was centrally located in the Phoenix area, less than a kilometer north of the Salt River (Abbott et al. 2003:19). Archaeologists consider AZ U:9:1(ASM) to have been the politically preeminent village north of the river and one of the most important prehistoric sites in the region (Downum and Bostwick 1993).

The village included a large platform mound, two ballcourts, a possible big house, and numerous habitation areas and cemeteries. Several large canals had their headgates near AZ U:9:1(ASM) (Woodbury 1960), and the village's inhabitants probably controlled the irrigation flow to other villages located along those canals, including AZ T:12:10(ASM) (Abbott et al. 2003:19).

S'eḏav Va'aki was occupied beginning in the late Pioneer period (in the A.D. 600s), continuing into the Classic period (A.D. 1150–1450), with the primary occupation ending circa A.D. 1400. The village may have had a population of 750 in the A.D. 1300s (Bostwick et al. 2023).

At 90 m long, 47 m wide, and 4 m tall, the AZ U:9:1(ASM) platform mound was one of the largest ever constructed by the Hohokam. Structures built on top of the mound would have added additional height. The platform mound's sides were steep and nearly vertical and consisted of plastered walls of rock and adobe. A compound wall that measured 118 by 79 m surrounded the mound. The wall was more than 1 m thick and as high as 3 m (Montero and Bostwick 2019).

Many archaeological investigations have been conducted at AZ U:9:1(ASM) over the decades, including work by Julian Hayden and his CCC crew in the mid-1930s. These various excavations have been summarized in a multivolume report series published by the S'eḏav Va'aki Museum (see Bostwick and Downum 1994; Downum 1998; Downum and Bostwick 1993; Mitchell et al. 2020).

Several cultural resource management projects have taken place within the boundary of the village. The two largest were done by archaeologists from Soil Systems. The SR 143 Project (also known as the Hohokam Expressway Project) consisted of testing and data recovery between 1988 and 1990. This large excavation project exposed a swath in the eastern part of the village (Abbott 1994a; Foster 1994a, 1994b; Kwiatkowski 1994; Mitchell 1994a, 1994b; Van Gerven and Sheridan 1994). The Sun America Project took place from 1997 through 2007 in the northern part of the village prior to commercial development. More than 2,250 features were encountered and documented, including structures and mortuary features (Mitchell and Montero 2023). Various smaller testing and monitoring projects have been carried out within or adjacent to the site boundary since 2000. These projects' findings range from isolated artifacts to features, including pithouses, middens and trash deposits, canal segments, and mortuary features (McDermott and Rayle 2004; Rogge and White 2003; Ryan 2008; Schilz et al. 2011; Serocki and Bostwick 2002; Stubing 2009; Turner and Stubing 2005; Walsh 2009).

AZ U:9:137(ASM) (formerly known as Las Canopas)

AZ U:9:137(ASM) (formerly known as Las Canopas) was a large Hohokam village located south of the Salt River. It consisted of a series of prehistoric canals, habitation structures, a platform mound, and a possible ballcourt and covered an area measuring approximately 460 acres (Dobschuetz 2004). The village was continuously occupied from the Vahki through the Civano phase (Rice et al. 2009:325). The site has been heavily disturbed by modern development. Frank Midvale observed a compound mound at the site in 1929, but by 1941 the mound had been leveled and the area plowed. By the 1960s, much of the site had been developed into housing and commercial properties (Hackbarth 1997).

From 1963 to 1982, the Department of Anthropology at Arizona State University conducted various field school excavations at the site, and numerous backhoe trenches and excavations attributed to the field school have been identified during subsequent investigations (Cable and Doyel 1986). The field schools identified pithouses, mortuary features, pits, and artifact scatters (Hackbarth 1997). S'e̠dav Va'aki Museum archaeologists monitored the construction of a utility line through a portion of the site in 1986, identifying and mapping 108 prehistoric features, including numerous pithouses and trash pits, 2 prehistoric canal segments, and 15 mortuary features (Cable and Doyel 1986). Data recovery conducted at the site in 2004 and 2005 encountered more than 650 features, 330 of them mortuary features. Other feature types included pithouses, pits, hornos, and canal segments (Dobschuetz 2004). Another large excavation project was conducted by Rio Salado Archaeology in 2005 and 2006 (Czarzasty and Rice 2009) and encountered more than 1,000 features, including house floors, hearths, middens, pits, artifact caches, and 632 mortuary features.

In 2022, archaeological excavations associated with the development of an apartment complex identified 285 prehistoric and historical features at the site. The former included pithouses, adobe structures and walls, middens, pits, canal segments, reservoirs, and 90 mortuary features (Cox 2022). An additional 155 human and 8 animal mortuary features were encountered during monitoring (City of Phoenix Archaeology Office, personal communication).

AZ U:9:67(ASM) (formerly known as La Lomita)

AZ U:9:67(ASM) (formerly known as La Lomita) is a village site along Canal System 2 northwest of the village of S'e̠dav Va'aki. A portion of the site was investigated in 1988 by Soil Systems for ADOT's East Papago Freeway Project. The part of the site that underwent data recovery dated to the Santa Cruz and Sacaton phases. More than 100 features were identified, including pithouses, pits, midden deposits, mortuary features, hornos, and canals. A few features dated to the Classic period, but most dated to the Colonial and Sedentary periods (Mitchell 1990). Additional work has been conducted at portions of the site, resulting in the discovery of numerous prehistoric features, including pithouses (Courtright 2004; Foster et al. 2006; Stubing and Grupp 2005; Stubing and Mitchell 1997). Work done by the Environmental Planning Group (EPG) for the development of a data center and support infrastructure encountered 94 prehistoric features, including 22 structures and 32 mortuary features (Arp and Peltzer 2022).

AZ T:12:220(ASM) (formerly known as Las Cremaciones)

The earliest archaeological work at AZ T:12:220(ASM) (formerly known as Las Cremaciones) was done by the U.S. Works Progress Administration's 1939–1940 Salt River Valley Stratigraphic Survey (Bostwick 1993). That project identified trash mounds, ballcourts, and several cemeteries containing both cremations and inhumations. Ceramics from the site indicated occupation from the early Pioneer through the late Classic period (Bostwick 1993; Deats and Cox 2021).

In 2005, Rio Salado Archaeology conducted testing and data recovery at AZ T:12:220(ASM) for the K. Hovnanian Homes development. That project recovered 123 mortuary features and identified or excavated

68 structures, 14 artifact caches, 29 hearths, 12 hornos or thermal pits, 31 pits, and 22 middens (Rice and Czarzasty 2008:1).

Additional testing at the site by North Wind Resource Consulting resulted in the recovery of five mortuary features and one instance of isolated human remains. In addition, the testing project found 10 structure floors, three pits, one thermal feature, and two indeterminate floors or pits (Peters and Meyer 2021).

In 2021, PaleoWest conducted archaeological monitoring of three areas of mechanical stripping in the project area around Feature 22, an isolated encounter of human remains that had been identified during the testing conducted by North Wind Resource Consulting (Deats and Cox 2021). The monitoring resulted in one encounter with a mortuary feature, which was documented, recovered, and repatriated.

In 2022, WestLand conducted mechanical stripping within the site ahead of data recovery efforts subsequently completed by Terracon. During the work, WestLand recovered and repatriated nine secondary cremations. Five instances of isolated human remains were also recovered and repatriated (Keur 2023). Data recovery conducted by EPG/Terracon documented 123 prehistoric features consisting of 41 cremations, 19 instances of isolated human remains, 3 dog mortuary features, 16 architectural features, 8 pits, 24 thermal features, 5 surfaces, 1 shell-processing area, and 6 middens (Schwartz et al. 2023:5).

Other major sites in or partly in Phoenix also include AZ U:9:73(ASM) (formerly known as Pueblo Viejo), AZ T:11:39(ASM) (formerly known as Cashion), AZ T:12:9(ASM) (formerly known as Villa Buena), AZ T:12:116 (ASM) (formerly known as Pueblo Primero), and AZ T:12:62(ASM) (formerly known as Dutch Canal Ruins).

Historical Resources

Historic period settlement in Phoenix began in 1867 with the rehabilitation of prehistoric irrigation canals and ditches. Over the subsequent decades, the small farming community grew into a large metropolis **(Figure 4)**. Based on the historical development of the community, encountering the following cultural resources would be expected within the city: historical neighborhoods, districts, buildings, and structures; homesteading, ranching, and agricultural sites; roads, trails, railroads, and transmission and utility lines; and historical refuse. These site types are described below.

Historical Neighborhoods, Districts, Buildings, and Structures

This site type predominantly consists of known historical buildings and structures that are above the ground surface and may be identified through pedestrian field survey or the review of historical documents, maps, photographs, and aerial images. Buried historical neighborhoods may also be present within the city, and separate, project-specific treatment plans should be developed for those sites. The following paragraphs detail the types of historical neighborhoods, districts, and structures that may be encountered in the city of Phoenix.

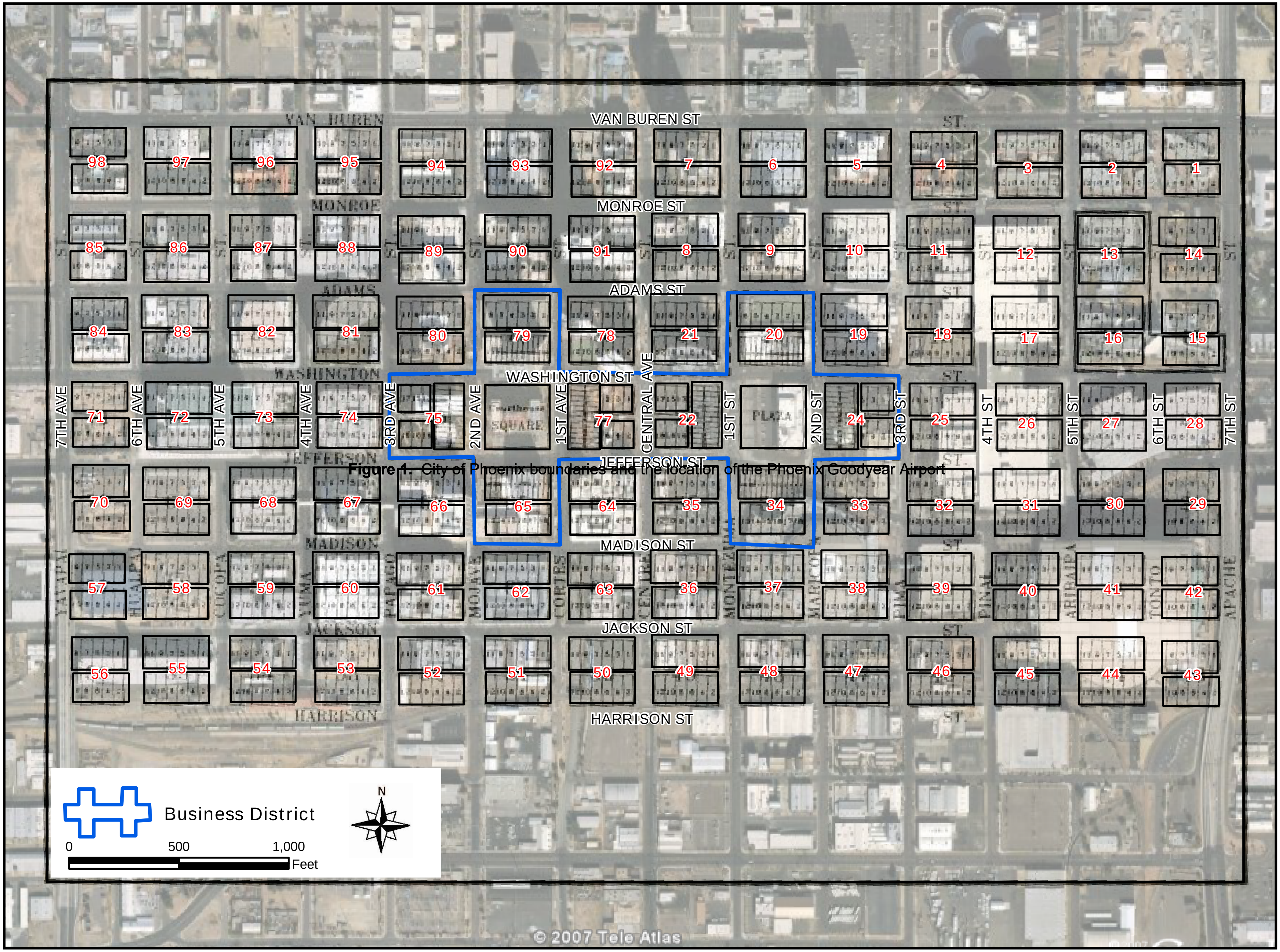

Figure 4. Location of the Original Phoenix Townsite

Thirty-five historic districts in the city of Phoenix are listed in the NRHP (Planning and Development Residential Historic Districts [phoenix.gov], accessed January 2024). These are composed of residential neighborhoods that were developed between the 1880s and 1950s. The districts represent the work of prominent architects and unique architectural styles as well as reflect the influence of historical federal housing design and development projects. In addition to districts, individual historical properties are present that have been listed in the NRHP. Individually listed properties in Phoenix include the homes of prominent citizens, commercial buildings, houses of worship, government and administrative buildings, schools, bridges, parks, and a tomb.

Historical places important to religious and ethnic communities, both those listed in the NRHP and those without an official designation, are still present in Phoenix (NPGallery NRHP Archive Search [nps.gov], accessed January 2024). The Phoenix Indian School located in midtown Phoenix, for example, which educated and housed thousands of Native American students over its nearly 100-year history, is open to visitors. The Temple Beth Israel, located just north of I-10 and south of McDowell Road, is listed in the NRHP in recognition of its importance to Phoenix’s Jewish community as the first permanent Jewish congregation in the city. The building now serves as a Jewish heritage center. The Latter-day Saints community, although predominantly located to the southeast in Mesa, constructed several meeting places in downtown Phoenix in the early twentieth century. Although many of these have since been demolished, the oldest standing Latter-day Saints chapel, the Phoenix Second Ward Chapel (now the Great Arizona Puppet Theater), is located north of downtown and just south of I-10. Historical properties important to religious and ethnic enclaves can be found scattered throughout the city.

During a study in 2004, the COP identified three regions in the city where African Americans lived and worked between 1868 and 1970 (Dean and Reynolds 2004): (1) the East region located south of Van Buren to the Southern Pacific railroad tracks, east of Central Avenue to 24th Street; (2) the West region situated south of Grant to the Salt River, west of 7th Avenue to 19th Avenue; and (3) the South region south of the Salt River to Southern, east of 16th Street to 28th Street. These regions contain African American residential neighborhoods and individual residential properties, commercial areas, churches, a hospital, schools, and recreational spaces. The study provides a list of historic resources in these historical African American regions that should be consulted if a project area or area of potential effects is located in these areas (Dean and Reynolds 2004).

Mexican Americans settled and farmed in Phoenix shortly after the founding of the community in the late 1860s. Phoenix has always reflected a strong Mexican influence but up until the 1970s remained an ethnically segregated city. Mexican American neighborhoods, or *barrios*, were developed in the southern section of Phoenix south of Van Buren Street, particularly south of the Southern Pacific railroad tracks, and north of the Salt River. The barrios in this area include residential, commercial, religious, administrative, and recreational spaces. In 2006, the COP developed a historic context for Hispanic historic properties that should be referenced if a project area or area of potential effects is located in a Hispanic community (Dean and Reynolds 2006).

Homesteads, Agriculture, and Ranching

The Homestead Act of 1862 allowed the federal government to distribute purportedly unoccupied lands to small-time family farmers for improvement and cultivation. In Arizona, both ranchers and farmers took advantage of the Homestead Act to secure low-cost agricultural and ranching lands in the Phoenix Basin. Homesteading, agricultural, and ranching sites can be identified by historical homesteading land patents, agricultural features like irrigation canals and ditches, and ranching features like corrals, cattle chutes, feed and water troughs, and barns. Irrigation sites may include features like water-control channels, headgates, laterals, spreaders, distribution canals, and ditches. The canal features may be earthen or lined with concrete and can vary considerably in depth and length. Abandoned historical irrigation features may or may not be visible on the ground surface. These may be filled with historical trash, sediments, and vegetation, concealing them from view. Conversely, in-use historical canals will be evident on the ground surface. Some presently in-use historical canals like the Grand and Arizona canals connect historical neighborhoods and offer parallel recreational spaces, including walking and biking paths, manicured landscaping, lighting, and seating. The SHPO provides guidance specific to the documentation of in-use historical irrigation infrastructure that should be referenced if present within a project area or area of potential effects (Arizona Historical Archaeology Advisory Committee 2019).

Linear Infrastructure: Roads, Trails, Railroads, and Transmission and Utility Lines

Historical linear infrastructure includes roads, trails, railroads, and transmission and utility lines. These structures may be in use, abandoned, or in use with abandoned segments. Some features, like roads and railroads, may have associated infrastructure, including culverts, trestles, bridges, access or frontage roads, and retaining features. If still in use, infrastructure may have undergone one or more episodes of maintenance or improvement such as the repaving of a roadway or the replacement of a transmission line pole. These resources may be identified through fieldwork or on historical maps and aerial imagery. The SHPO provides guidance specific to the documentation of in-use historical resources that should be referenced if these are located in a project area or area of potential effects (Arizona Historical Archaeology Advisory Committee 2019).

New Deal Projects in Phoenix

In 1933, President Franklin D. Roosevelt signed the New Deal into law. This legislation provided employment to unemployed men, setting them to work on improving both urban and rural spaces in and around the city of Phoenix. The CCC, Public Works Administration, and Works Progress Administration were active in Phoenix and its vicinity during the 1930s and early 1940s, and historical and archaeological resources from the New Deal era are still present in Phoenix (Collins 1999).

Two CCC camps were located at South Mountain Park between 1933 and 1940. Workers from these camps completed extensive improvements at the park, including an entrance station, lookout points, roads, erosion-control features, and ramadas. Many of these features are still in use and readily apparent on the ground surface. The camp and barracks are no longer standing, but archaeological remains associated with the CCC are still likely to be present (Living New Deal 2024a).

The Public Works Administration-funded projects around Phoenix included the construction of buildings at Phoenix College and the State Capitol Annex Building as well as improvements to public parks and schools and road paving and construction. Many of these historical structures are still in use and are easily identified through historical records and photographs (Living New Deal 2024b).

The Works Progress Administration completed a number of improvement projects in the city of Phoenix in the 1930s. These include improvements to the grandstand at the Arizona State Fair grounds, the construction of the National Guard Arsenal, additions to the Arizona State Hospital, sidewalk and road improvements, and improvements to city parks (Living New Deal 2024b). These projects are readily identifiable by the distinctive “WPA” stamps. They can also be identified through historical records and photographs.

In addition to these projects, archaeological work was conducted in the 1930s at S’e-dav Va’aki by the CCC, Public Works Administration, and Works Progress Administration. With the support of these agencies, including funding and labor, portions of S’e-dav Va’aki’s large platform mound were excavated under the direction of the first COP Archaeologist, Odd S. Halseth.

Refuse Disposal

Historical populations living in Phoenix and its vicinity produced a considerable amount of trash throughout the nineteenth and twentieth centuries. The methods by which refuse was managed and ultimately discarded changed over time and varied by location. In the 1870s, trash in Phoenix was disposed of in irrigation canals and ditches, in empty lots, and on the streets. By the 1880s, the buildup of trash had become a nuisance, and an 1881 ordinance was passed prohibiting littering in streets, sidewalks, canals, and irrigation ditches (Sullivan and Griffith 2021). Rural communities on the outskirts tended to manage their own refuse disposal, while urban communities paid for waste-disposal services. Some enterprising urbanites also likely opted for temporary, cost-effective, and sometimes illegal methods of refuse disposal, including the dumping of waste in alleys, abandoned buildings and vacant lots, and abandoned privies and wells. Rural populations tended to dump their refuse in arroyos and naturally low-lying areas on the outskirts of their communities and homesteads.

The practice of dumping refuse on the ground surface in open dumps was the most popular form of waste disposal in Arizona up until the 1960s. Garbage in open dumps was often burned to reduce volume and make room for additional dumping. In some locations, livestock, especially pigs, was given access to the dumps to feed on the refuse. Following the adoption of the Clean Air Act of 1970, the burning of garbage was no longer permitted, and the buildup of garbage, associated pests, and foul odors at the dumps made them a hazard to public health. In 1979, open dumps were outlawed in Arizona, and landfills—the practice of compacting and burying garbage under sterile soil—became the primary method of refuse disposal across the state (Sullivan and Griffith 2021).

Historical refuse-disposal sites in Phoenix may be buried or located at the ground surface and are sometimes found within other archaeological features like privies, wells, and canals or in natural features like arroyos, drainages, and depressions. Garbage within the dumps may also exhibit signs of additional treatment, including sorting, burning, and compaction. The SHPO has developed a context for defining and interpreting historical refuse deposits in Arizona. This context should be referenced if refuse-disposal sites are identified in a project area or area of potential effects (Sullivan and Griffith 2021).

RESEARCH DESIGNS

Prehistoric Sites Research Design

The objectives of the archaeological research conducted under the guidance of this HPTP will vary according to the A/NRHP status of the cultural resources being studied.

Eligibility testing will focus on evaluating the research potential and significance of cultural resources with the goal of providing an A/NRHP recommendation for them using a relevant historic context.

Boundary testing will be conducted to test for the extent of site boundaries.

Phase I data recovery will be formulated to evaluate the nature and extent of the cultural resources within A/NRHP-eligible sites. Phase II data recovery will be formulated to recover significant data from A/NRHP-eligible sites. The main theme of all research undertaken during these investigations should be to inform on the distribution, growth, and development of the archaeological sites and canals in the Phoenix Basin. Based on that general theme, research topics pertaining to the prehistoric occupation of the Phoenix Basin are presented below and consist of cultural continuity and transitions; chronology; settlement patterns; site formation, function, and growth; settlement structure and organization; subsistence and specialized production; regional exchange and interaction; and households. Research questions should be tailored to each individual project.

Pre-Formative Sites and Material Culture

Some of the oldest sites have left the smallest traces in the archaeological record. Paleoindian and Archaic sites are less common than more recent sites due to the nature and location of activity/habitation and the longer span in which displacement and destruction have occurred. Many of these sites have been impacted by subsequent occupation, and the dynamic floodplain may have eroded and buried additional sites. Evidence of the use of the Phoenix Basin by Paleoindians is limited to a few isolated projectile points (North et al. 2005). Similarly, much of the evidence of an Archaic period occupation of the Phoenix Basin consists of isolated projectile points and surface sites with assemblages of flaked and ground stone artifacts (Hall 2018:56). However, sites with Archaic period components have been identified in Phoenix, including AZ T:11:94(ASM) (Graves et al. 2011), AZ T:7:419(ASM) (Hall 2018), AZ U:5:33(ASM) (Hall 2018), and AZ U:1:25(ASM) (formerly known as Brown's Ranch Rock Shelter) (Wright 2002).

Questions involving Paleoindian and Archaic sites in the Phoenix Basin include:

Paleoindian

- What geological conditions, if any, are present in the Phoenix region that are conducive to the preservation of Paleoindian sites?

Archaic Period

- Site Preservation
  - What geological and geomorphological conditions are present in the Phoenix region that are conducive to the preservation of Archaic period sites (e.g., Early Archaic features have been found in Holocene alluvium on the Lehi Terrace)?
  - What conditions have affected the preservation of Archaic sites on the floodplain?

- Chronology
  - What is the occupational history of the site?
  - What evidence is there of hiatuses, either relative or absolute, in this occupational history?
  - How can chronometric dating techniques such as radiocarbon and archaeomagnetism be used to date the occupation?

- Site Type
  - Was the site a temporary campsite or a longer-term habitation?
  - Was the function of the site resource procurement or processing?

- Subsistence
  - What natural resources did the site's inhabitants exploit?
  - What plants, animals, lithic raw materials, and other resources were used?
  - What evidence is there, if any, of agricultural practices?
  - If roasting features are found, is there evidence of what was being processed in them?

Data Requirements

Geomorphological studies can provide information regarding the potential for the preservation of pre-Formative period sites. For example, the Salt River floodplain may have been too dynamic an environment for the preservation of most early sites. The analysis of material culture from a site can help determine to what period it dates. For Paleoindian and Archaic period sites, regional projectile point types can inform on the relative age of an occupation. Other techniques that can be used to date the occupation include radiocarbon dating, optically stimulated luminescence (OSL) dating, thermoluminescence (TL) dating, and stratigraphic associations of features and deposits. Site types might be determined by the artifact assemblages recovered and by the types of features present. An assemblage of projectile points and flaked stone might indicate a hunting site, or a flaked stone assemblage with a high frequency of shatter and other debitage might represent a quarry or a production site. The presence of thermal features and/or structures might indicate a habitation site rather than a limited-activity site. The data needed to address subsistence can be obtained through the analysis of pollen, macrobotanical, and faunal remains collected during data recovery.

Hohokam

Cultural Continuity and Transitions

As stated previously, the O’Odham people are the lineal descendants of the Hohokam (Hill 2019; Loendorf and Lewis 2017, 2023; Morgan et al. 2023), and the Piipaash people are the descendants of the Patayan. As stated by Barnaby Lewis, “*Huhugam* is not the same as the archaeological term *Hohokam*, which is limited by time periods and does not represent the true reverent acknowledgement of ancient ancestors, as well as living O’odham who will become ancestors today or tomorrow” (Archaeology Southwest 2020). Fertelmes et al. (2022) demonstrated Akimel O’Odham affiliation and descendant relationship with the ceremonial cave and its material culture at *Nanakmel Kii* (Bell Butte). The Piipaash also have a historical connection to the butte, which they call *Qmpanyk Nyiva* (Fertelmes et al. 2022:96). Continuity from Hohokam to O’Odham is found in oral traditions such as the Paḍ ‘Aangam tradition, which identifies several historical O’Odham leaders and establishes the existence of O’Odham settlement along the lower Salt River and the Queen Creek watershed after the fall of the Hohokam platform mounds (Darling and Winters 2021). As Teague (1993:435) stated, comparisons of oral traditions to archaeological evidence shows a historical core in the traditions of the O’Odham. “These histories reflect direct knowledge of events in prehistoric Arizona” (Teague 1993:436).

There is also continuity in the use of resources from the Hohokam to the O’Odham, such as hematite and ochres (Eiselt et al. 2011) and obsidian (Loendorf et al. 2013). Continuity is also found in ceramic manufacture and the continuous occupation of the region (Morgan et al. 2023:77). Future archaeological research should address the continuum of Hohokam to O’Odham occupation, and field methods and research questions must be structured accordingly.

The human occupation of the Phoenix Basin is complex and dynamic and has been subjected to various environmental and cultural changes. Life persisted, but lifeways adapted. Some elements continued while others were updated or discontinued. Some of these changes can be seen in the material culture and have been used by archaeologists as cultural and/or chronological markers to divide time into periods and phases representing generalizations of material culture. The transitions between these designations were often the result of innovation, expansion/recession, immigration, war, drought, and a host of other factors.

Investigators should consider the following in regard to Hohokam Cultural Continuity and Transitions:

- What transitions are apparent in the material culture?
- Is there evidence of the reuse of canals over time?
- What land use patterns can be identified either through archival or archaeological records?
- What is the material evidence of continuity from the Hohokam to the O'Odham occupation of the region?
- What categories of material culture demonstrate continuity from the Hohokam to the O'Odham?
- What patterns of continuity are there from Hohokam to O'Odham settlements?

Data Requirements

Data to address questions regarding continuity from the Hohokam to the O'Odham can be found in material culture studies such as Loendorf's research into the continuity of projectile points (Loendorf 2012). Continuity can also be found in the study of ceramics. The Akimel O'Odham returned to making red-on-buff pottery, which has many similarities to pre-Classic period ceramics, including the paddle-and-anvil construction technique (Loendorf and Lewis 2017). Similarities can also be found in architectural features. The O'Odham built structures that were similar to Hohokam pithouses (Bostwick et al. 1996; Loendorf and Lewis 2017).

Chronology

The topic of chronology is critical to archaeological studies **(see Figure 2)**. To address research questions on topics like subsistence, site structure, and trade and exchange, it is crucial to know as accurately as possible to what period archaeological remains date. Despite several decades of research and the accumulation of considerable chronometric data, archaeologists continue to argue about the Hohokam chronology.

Early chronological research was directed toward defining the Hohokam culture history, delineating the periods and phases representing the culture's long tenure in the Sonoran Desert and linking these phases to our modern measure of time, the Christian calendar (Gladwin et al. 1937; Haury 1976). The basic framework of the Hohokam cultural chronology was established by Gila Pueblo's 1934–1935 excavations at AZ U:13:1(ASM). In 1937, the estimated duration of the Hohokam cultural sequence was 1,400 years (Gladwin et al. 1937:247), an impressive—and controversial—length of time. Haury returned to AZ U:13:1(ASM) in 1964–1965 to gather new data to address the "chaotic state of affairs" that had emerged since 1937, ending about 20 years of dormancy in the study of Hohokam archaeology (Haury 1976:3). On the topic of the Hohokam chronology, he wrote that the new excavations upheld the order of phases that had been determined in 1934–1935, and based on the new data he proposed that the Hohokam culture spanned the period from 300 B.C. to A.D. 1450, or 1,750 years (Haury 1976:351).

Hohokam research increased dramatically in the late 1970s through the 1980s due to the passage of the NHPA and the ensuing boom in cultural resource management projects. These projects amassed new

Hohokam chronological and chronometric data, including a large body of archaeomagnetic dates. Dean's (1991) synthesis of nearly a decade of this chronological information reaffirmed that the Hohokam chronological framework was based on sound stratigraphic evidence but that the evidence supported a somewhat shorter Hohokam tenure than that proposed by Haury in 1976. Depending on how "Hohokam" is defined as an archaeological manifestation, modern calibrations of the Hohokam cultural tenure range from a period of at least 750 years to more than a millennium.

Since the 1980s, the direction of Hohokam chronological research has shifted from verifying and calibrating the Hohokam cultural sequence to attempting to gain higher-resolution chronologies of Hohokam occupations. Archaeologists today use the entire suite of chronological and chronometric methods available to date individual features to the highest level of resolution possible for the purposes of addressing research questions related to household size and composition, settlement structure and development, and the timing of key events in the Hohokam cultural sequence such as the shift away from the ballcourt system and the rise and eventual discontinuance of the succeeding platform mound system (Abbott et al. 2012; Deaver 1988, 2004; Henderson 1989; Henderson and Rice 1987; Wallace 2001, 2004).

For this research topic, only a few research questions are provided because time is an element of every research theme. As such, the questions of when something occurred and for how long are addressed under various other topics. Architecture, pottery, and artifact styles can provide the information necessary to link features and deposits to cultural phases, but archaeologists rely strongly on chronometric data for assessing questions about time as both a relative and an absolute measure.

The following questions are among those that address the topic of Chronology:

- What is the occupational history of the site?
- What evidence is there for periods of population increase or decrease?
- Can we use chronometric dating techniques like radiocarbon and OSL (Berger et al. 2004; Watkins et al. 2011) to date canals?
- What are the ages of the features at the site?
- What is the evidence for the duration of occupation or use of the site?
- Is there evidence of changes in land use or the use of space over time?

Data Requirements

The analysis of ceramics from a site can help determine to what phase or phases the features date. Other techniques that can be used to date the occupation of a site include radiocarbon dating, OSL dating, TL dating, archaeomagnetic dating, ceramic seriation and ceramic cross-dating, projectile point typology, and stratigraphic associations of features and deposits. Superpositioning of architectural features and analysis of architectural styles can also aid in the dating of occupations.

Settlement Patterns

This research focus not only includes how sites are distributed across the landscape but how that distribution changed over time. Landform can be a major factor in site location such as access to arable land and an advantageous viewscape. Water is the lifeblood of the desert, and the location of many sites was determined by access to sources of water. The Phoenix area is known for its extensive canal systems that modified the landscape to bring water to thousands of acres (Caseldine 2020a; Howard and Huckleberry 1991). Some sites are associated with other resources such as stone, temper, and wild resources.

Sites are best understood not only in relation to landform and access to resources but within the context of other sites. The canal systems that watered extensive acreage also connected communities that needed to coordinate with each other for use and maintenance of the canals. Other systems are more nebulous but can be seen in the presence of trade items and site unit intrusions, suggesting the presence of extra-regional cultural groups. In addition, O'Odham oral traditions provide information on settlement patterns such as the locations of specific platform mound sites (Bahr et al. 1994; Teague 1993:440).

The following questions are related to Settlement Patterns:

- What were the relationships among contemporary sites across the landscape?
- How does a specific site compare to other sites in the area?
- What archaeological sites are found in the area?
- What is the range of variability in the types of structures, arrangement of structures, and site layout in the study area?
- What is the temporal range represented by the sites in the area?
- What patterns can be perceived in the spatial and temporal distribution of site types in the study area?
- Do patterns of site form, function, and temporal distribution co-vary with environmental variables?
- What were the determining factors in site location?

Data Requirements

Data for addressing research questions on the topic of settlement patterns can be obtained through archival research using CAO site records, the ASM Archaeological Records Office, and AZSITE records pertaining to the distribution of sites across the landscape. In addition, soil survey maps (e.g., Hartman 1977), geological maps, and U.S. Geological Survey (USGS) topographic quadrangles can be used to place a site within its environmental setting. Areas within a site used by different cultural groups can be difficult to identify in the archaeological record but might be indicated by a higher frequency of material culture such as ceramics from a foreign source. This was the case with the possible Patayan enclave identified at AZ T:12:10(ASM) (Teague and Deaver 1989).

Site Formation, Function, and Growth

Investigations of site function can be used to determine a site's role in prehistoric society. Was the site a habitation or was it the location of a limited activity such as plant procurement and processing? Formal architectural features are an indication that a site was a habitation, whereas smaller, more expediently constructed architecture may indicate a short-term or seasonal occupation. Features such as roasting pits in the absence of architecture are indicative of a limited activity centered on food processing. Often, a site had multiple functions, or its function changed over time.

Determining how a site functioned in prehistoric settlement and subsistence systems involves the integration of a variety of evidence. The location of the site on the landscape and its proximity to resources that archaeologists recognize as important to the culture is one piece of information. The presence or absence of features speaks to the nature of the activities conducted at a site and the duration of the site's use. The types and varieties of features present are also important. For example, structures indicate some form of residence and habitation, cooking pits indicate food preparation, and large, subterranean pits indicate long-term food storage. The artifacts at a site also provide a wealth of information about the activities that occurred there and hence the site's overall function.

The length of a site occupation can be a major factor in its interpretation. Some sites reflect expedient uses such as resource procurement, whereas others show evidence of a lengthy occupation with reuse, expansion, and multiple layers of depositional history.

Intrinsically connected with understanding site function is the site boundary. Small sites may consist of a single feature, whereas larger sites may have multiple components or loci. The extent of a site is useful from an interpretive and managerial perspective. Site boundaries are arbitrary and established for cultural resource management purposes. Many sites have been mapped, but because of misplotting or destruction from natural or man-made factors, boundaries may have changed over time. It should be noted that the actual landscape used by a site's inhabitants exceeded the physical site boundary identified for administrative purposes.

The following questions are useful in determining the current extent of a site:

- What features are present and what activities do they represent?
- What evidence exists for specific residential areas?
- Is there evidence of use-areas or activity areas?
- What is the relationship between tool assemblages and site function?
- Does the assemblage indicate seasonality of use or continuous, year-round occupation?
- How did villages form and grow over time?
- Is there evidence of immigration contributing to the growth of a village? Or is the village's growth consistent with a natural increase in population?
- What are the attributes of focal villages (i.e., ballcourt and platform mound villages)?
- How can the site boundaries be defined or existing site boundaries refined based on findings?
- How do the boundaries determined during fieldwork compare to those previously recorded?

Data Requirements

To determine the formation and growth of a site, temporal data for as many features and structures as possible are needed. That information can be used to reconstruct the history of the site's occupation and changes in site structure and organization through time. Site size and feature morphology can be indicative of site type and function. Artifact assemblages that are extensive enough to represent the main activities that occurred at a site can aid in determining site type. Botanical data from pollen and macrobotanical sample analyses to provide information on the seasons of the year represented by the plant remains would be another data requirement. Other evidence can be found in the types of features present and the nature of the architectural remains.

Settlement Structure and Organization

Archaeologists divide Hohokam settlements into four basic types: (1) villages, (2) hamlets, (3) farmsteads, and (4) field houses (Gregory 1991:160). In this typology, villages were year-round habitation sites with a population greater than 100 inhabitants; hamlets were also occupied year round but had fewer than 100 inhabitants; farmsteads were generally smaller than hamlets with a focus on agriculture and were occupied seasonally; and field houses were individual structures and associated features that were used solely for tending fields (Crown 1983). To these four site types should be added limited-activity sites, including agricultural sites and resource-procurement and processing sites.

Villages were the largest and most complex settlement type in the Hohokam settlement hierarchy. These often had community-integrative features such as ballcourts and platform mounds that were not found at other site types (Gregory 1991:162). Villages with multiple community-integrative or "monumental" architectural features are classified as primary villages, and those with only one or no such features are classified as secondary villages (Cable and Mitchell 1991).

Gregory (1991) defines hamlets as habitation sites that were inhabited by fewer than 100 individuals but that were also occupied year round. In reality, there appears to be a substantial enough size difference between what most archaeologists would label a village and what they would label a hamlet that we can avoid having to categorize sites based strictly on estimates of population.

Stone (1993:71) states that "farmsteads represent permanent, full-time occupation, and non-specialized activity regimes." According to Gregory (1991:163), however, farmsteads existed for the purposes of agriculture and other subsistence activities and were occupied only seasonally. The differences in these authors' characterizations of farmsteads notwithstanding, both agree that farmsteads and hamlets differed in size and function. According to Stone (1993), farmsteads consisted of a single pithouse cluster (i.e., a courtyard group) occupied by a single corporate group; hamlets were made up of multiple pithouse clusters with a corresponding number of corporate groups. Stone found that for the northern periphery of the Hohokam regional system, artifact assemblages were not particularly useful in determining site type and suggested instead that the differences were in the duration of occupation rather than the activities performed. Cable and Mitchell (1991:96) state,

> Farmsteads are small, isolated habitations that are at an organization level below that of a hamlet or village segment. They consist of one to as many as three contemporary pithouses, trash deposits, and occasionally a small cemetery. When multiple houses are present, they generally do not exhibit a courtyard-like arrangement but demonstrate instead loose spatial relationships such as side-by-side or front-to-back arrangements. Farmsteads were occupied by small social groups, perhaps only one or two families, but had the potential for expansion and growth.

Field houses were individual structures established for the purpose of tending agricultural fields and are believed to have been occupied during periods of planting, growing, and harvesting (Gregory 1991:163). Field house sites can be distinguished from habitation sites by their relative isolation from other houses, their proximity to purported field locations, and their artifact assemblages, which are more limited in size and variability. These sites consist of a single, small pithouse or jacal structure (Stone 1993:66). The field house features themselves differ from more formal houses in that they lack entryways, plastered floors, hearths, and substantial roof support posts (Masse 1991; Stone 1993). The houses are often smaller in size as well (Masse 1991:198). The Hohokam appear to have used field houses from the Pioneer period onward (Gregory 1991).

The structure of Hohokam settlements has become the primary focus of nearly all studies of the region's prehistory. In the early 1980s, Wilcox (Wilcox et al. 1981) reevaluated the data from AZ U:13:1(ASM)

(Gladwin et al. 1937; Haury 1976) and identified distinct site patterning that had not been observed by previous researchers. Since then, the internal arrangement of Hohokam habitation sites has been studied intensively. For example, Wilcox and Howard (1990; Howard 1990) suggest that Hohokam village AZ U:9:48(ASM) (formerly known as Los Hornos), located in present-day Tempe, exhibits an organizational hierarchy that includes the household, the courtyard group, the village segment, the moiety, and the village itself. Subsequent excavations at the site supported this model of site structure (Chenault et al. 1993; Effland 1990).

The evidence shows that the Hohokam constructed their built environment in a patterned manner (Doyel 1987), and the houses at sites larger than farmsteads are usually clustered together in what are referred to as courtyard groups (Sires 1987). Clusters of these courtyard groups, along with their associated trash mounds, cemeteries, and extramural features, are then grouped into residential units or residential areas (Howard 1990). Residential units, in turn, are arranged around a central plaza area to form a village segment (Howard 2000). Some large Hohokam sites consisted of just one village segment, while the largest villages contained several separate segments. The segmented village concept was developed by Chang (1958), who stated that each village segment contained the “nominal complement of facilities found in a village.”

A Hohokam courtyard group was made up of associated houses built at right angles to each other (Howard 1985; Sires 1987). The entryways of these houses were oriented toward a central area or courtyard that was defined by the arrangement of the houses. Typically, two to six houses formed a courtyard group (Seymour 1990). It is possible that one or more of those houses were not habitation structures but were used instead for storage or some other purpose; however, most evidence suggests otherwise, as houses usually have hearths and other indications of habitation. Archaeologists working in the Hohokam region typically agree that nuclear families occupied individual houses and extended families occupied courtyard groups (Fish and Fish 1991). Farmsteads, and perhaps some small hamlets, may have consisted of a single courtyard group.

Archaeologists refer to the next level of site structure larger than the courtyard group as loci, domestic areas, village segments (Doelle et al. 1987; Henderson 1987), residential areas, or residential units (Howard 1990). Residential units are aggregates comprising multiple contemporaneous courtyard groups. These were located near and are therefore functionally associated with such communal-use features as cemeteries, trash mounds, large trash pits, and hornos. Fish and Fish (1991) call the residential unit a supra-household unit and equate it with a corporate group or lineage. It appears that the Hohokam hamlet typically consisted of one or more residential units.

Jerry Howard (2000:168) defines village segments as “circular arrays of clustered pithouses (residential areas), trash pits (disposal areas), and mortuary features (cemeteries) around communal-use areas that contain large earth ovens, also known by their Spanish name hornos.” In other words, a village segment consists of residential units arranged in a circular pattern around a plaza. This basic pattern has been identified at AZ U:13:1(ASM) (Wilcox et al. 1981), AZ U:9:48(ASM) (Howard 1990), and AZ T:12:1(ASM) (Henderson 1987).

Archaeologists working in the Hohokam region have argued over the concept and definition of village segments. Wallace (1995) disagreed with Howard (1990), stating that there was not enough evidence for a level of site structure above the residential unit. Wallace, in fact, discarded the term “residential unit” and referred to that level of aggregate as a “village segment,” using it to refer to clusters of courtyard groups and associated features.

In a significant study of pre-Classic villages, Wallace et al. (2020) presented a model for Hohokam villages that consisted of a plaza with an associated ballcourt surrounded by supra-household groups and their associated cemeteries, trash mounds, hornos, and roasting pits (Wallace et al. 2020:135). Wilcox et al. (1981) identified a central plaza at AZ U:13:1(ASM) that was surrounded by an inner habitation zone and an outer habitation zone. That pattern was also found at AZ T:12:148(ASM), where archaeologists identified two plazas, both with inner and outer settlement zones (Lindeman 2016). Wallace et al. (2020) also defined plazuela groups” (formerly called village segments by Henderson [1986, 1987] and Wallace [1995]). Plazuela groups consisted of courtyard groups surrounding or adjacent to a communal-use plazuela that contained features such as hornos and cemeteries but not ballcourts or capped mounds (Craig and Woodson 2017:338; Walace et al. 2020:126). Plazuela groups were located outside the near-plaza (inner) zone of settlement at villages containing central plazas and ballcourts.

Beyond the spatial structure of sites, archaeologists have struggled to identify levels of social organization for the Hohokam (e.g., Bayman 2018; Elson 2023; Elson and Abbott 2000; Fish and Fish 2000; Harry and Bayman 2000). However, O’Odham traditions show that during the Classic period, most platform mounds were ruled by a single, strong leader (Rice and Loendorf 2023:247).

The following research questions apply to the topic of Settlement Structure and Organization:

- What levels of integration are apparent at the site?
- Can courtyard groups be identified?
- Can residential units be identified?
- What are the spatial relationships between the pithouses and extramural features?
- What evidence is there for integration on a level equivalent to plazuelas or village segments?
- How are houses, extramural features, and trash mounds arranged within the site, and what do these arrangements tell us about social organization?

- Are communal-use features present at the site and where are they located? For example, do hornos or roasting pits surround the communal-use areas of village segments? What do these arrangements tell us about social organization?
- Is there evidence of a central plaza at the site, similar to those at AZ U:13:1(ASM), Casa Grande, AZ U:9:48(ASM), and AZ U:9:1(ASM) (S'eḏav Va'aki) (Howard 1990; Wilcox et al. 1981)? If so, what activities may have taken place there?
- Wilcox (1991a:261; Wilcox and Howard 1990:71) proposed that Hohokam villages in the Phoenix Basin may have been divided along moiety lines by the Sedentary period. Is there any evidence that two separate social groups, or moieties, were present within or between villages?

Data Requirements

To examine site structure, it is desirable to expose in plan view a large portion of the site. Large-scale horizontal excavation (stripping and the removal of overburden) will be necessary to see as much of the horizontal layout of the site as possible. With such stripping, the outlines of exposed features can be added to a site map. Certain features can then be selected for full or partial excavation.

Along with the identification of spatial relationships among features, more detailed information on site structure will be obtained through the excavation and detailed recording of features. To establish at least the relative contemporaneity of structures in a possible courtyard group, for example, it will be necessary to obtain a sample of temporally diagnostic ceramics from the floor, along with any other datable materials.

Subsistence and Specialized Production

This research topic is concerned with how the prehistoric and protohistoric inhabitants of the Phoenix Basin obtained food and other resources. As Masse (1991:197) states, "The archaeological study of subsistence is a manifestly complex subject, one that goes far beyond the simple identification of food remains and the technologies used to acquire or produce the food." The Hohokam employed various subsistence strategies over time. Early settlements were usually located near permanent water sources, whereas later site locations also incorporated marginal subsistence areas such as bajadas (Doelle and Wallace 1991).

Hohokam habitation sites generally exhibit evidence of a wide variety of plant and animal resources. The importance of such resources in the archaeological record of a site has often been quantified on the basis of their occurrence in analyzed samples (Gasser and Kwiatkowski 1991). There are continuities in subsistence from Hohokam to O'Odham times. Future archaeological research should address the continuities in subsistence practices, and the field methods and research questions must be structured accordingly.

It has been proposed that Hohokam villages in the Phoenix Basin participated in a system that included crop specialization (Gasser and Miksicek 1985). Recognition of resource specialization can be found in frequencies that are very high or higher than are typical of temporally and functionally similar sites. In addition, archaeologists believe that certain types of pottery, stone tools, and shell ornaments were crafted by artisans working part time. Some of the more ornamental projectile points, for example, are believed to have been produced by specialists (Crown 1991a; Loendorf et al. 2017).

Some inhabitants of the Phoenix Basin would have been involved in a variety of tasks related to subsistence, including the production of ground and flaked stone tools, bone tools, pottery, and ornaments of stone and shell. Items believed to have been used for ritual purposes such as palettes, censers, and figurines may have also been produced.

The following questions are posed under the research topic of Domestic and Specialized Production:

- What natural resources did the inhabitants of the site exploit?
- What plants, animals, lithic raw materials, and other resources were used?
- Were fish among the faunal resources? If so, what types?
- What agricultural resources did the inhabitants cultivate and use?
- To what degree was agriculture emphasized relative to wild-resource procurement?
- What resources were processed in roasting pits and hornos?
- How were both cultivated and gathered resources processed?
- What evidence is there of agricultural specialization?

Data Requirements

Data needed to address the research questions under this theme can be obtained through the analysis of pollen and macrobotanical and faunal remains collected during data recovery. Researchers should emphasize the analysis of samples collected from structure floors and sealed contexts. These analyses can help determine if the site's inhabitants were cultivating maize, agave, cotton, etc., and whether they favored one over the other. The analyses might also give an indication of the percentages of the inhabitants' diets that were from domesticated versus native plants. Analysis of faunal remains will give some indication as to the types of animals hunted.

Evidence of subsistence-related activities and resource-processing methods are important data sets that can be used to support botanical information. Tool assemblages, including tabular and ground stone tools, can provide insights into the types of resources exploited.

Artifacts—including ceramics, ground and flaked stone, and shell—collected during data recovery can be analyzed to address questions about how those artifacts were produced and how the raw materials for them were obtained.

Regional Exchange and Interaction

The inhabitants of the Phoenix Basin would have interacted with other people on multiple levels: within their villages and settlements, with other sites in their community, and with other regions and cultures. A major part of that interaction would have involved the exchange of material goods, information, and ideas.

Advances in science’s ability to identify raw material sources through chemical and visual characterization methods have made it possible to track prehistoric items (e.g., ceramics) from their place of manufacture to their ultimate place of use and deposition. This has led to an increase in archaeologists’ understanding of exchange systems and socioeconomic relations among the Phoenix Basin Hohokam (Abbott 1994b; Doyel 1991a, 1993; Motsinger and Walsh-Anduze 1994; Walsh-Anduze 1993a, 1993b). The presence of exotic and semi-exotic goods such as shell, turquoise, obsidian, and copper in artifact assemblages offers insights into a community’s participation in long-distance socioeconomic networks (Doyel 1991b; Montero and Bostwick 2019). Identifying in the archaeological record the exchange of ideas and information—and the nature and mechanisms of that exchange—is, of course, much more difficult. However, some examples of the exchange of ideas, information, and concepts have been identified. These include the widespread construction of ballcourts outside the Hohokam region (e.g., Wupatki) (Wilcox 1991b; Wilcox and Sternberg 1983) and the presence of cremation mortuary features in various portions of the Southwest. Shared patterns of material culture and societal concepts among the peoples of the Southwest and those of western Mexico are found in platform mounds, ballcourts, adobe compounds, modeled spindle whorls, ornamentation, and the widespread use of shell for bracelets.

Artifact assemblages can illuminate the socioeconomic relationships within a community itself as well as with neighboring communities. For example, the distribution of scarce commodities can provide evidence of social differentiation, with some individuals and groups having better access to scarce commodities than others. Further, these commodities, once obtained, were indicators of elevated social status. In Bayman’s (1992) study of the distribution of exotic artifacts within an early Classic period community, he considered four categories of artifacts: (1) painted pottery, (2) shell, (3) obsidian, and (4) projectile points. His analysis suggested that the residents of platform mound sites had better access to exotics than the residents of other villages in the platform mound community. Similar findings have been obtained from other studies in the Phoenix area (e.g., Downum and Bostwick 2003; Mitchell et al. 2020).

Many archaeologists studying the Hohokam believe that specialization in shell ornament production and trade by certain sites may have been a “buffering” strategy for settlements in the western periphery (Doelle

1980). In this scenario, communities in the Papaguería traded with settlements in the Phoenix Basin, where agriculture was more favorable (Doelle 1980). This type of trade, however, is difficult to identify in the archaeological record. There is evidence that some shell ornament production sites (e.g., AZ AA:1:66[ASM] [formerly known as Shelltown] and AZ AA:1:62[ASM] [formerly known as Hind Site]) produced at least some of their own food, weakening the "buffering" hypothesis. Most marine shell ornament production appears to have occurred in the western periphery (Howard 1993; McGuire and Howard 1987), although some took place at core area settlements like AZ U:13:1(ASM) (Bayman 2001:278; Seymour 1988) and AZ U:9:165(ASM) (formerly known as La Plaza) (Gregory 2012).

The Papaguería was also the source of some of the obsidian found at sites in the Phoenix Basin, suggesting that obsidian from the Sauceda source may have moved through the same exchange networks as shell. Although the Hohokam used obsidian from local sources in the middle and lower Gila River valleys, it was also imported from sources throughout the greater Southwest (Bayman and Shackley 1999; Doyel 1996, 1998; Shackley and Tucker 2001). Changes in obsidian procurement and exchange may have been related to the demise of the ballcourt network and the rise of the platform mounds during the early Classic period (Fertelmes et al. 2012:281; Loendorf 2019).

Other materials such as ground stone appear to have been exchanged throughout the Hohokam region (Fertelmes 2014). Evidence suggests that metates produced in the northern periphery were traded for pottery and other items from the Phoenix Basin (Bostwick and Burton 1993:368), although it is possible that people in the Phoenix Basin may have directly procured grinding implements from the New River area (Bayman 2001:277).

It has been suggested that exchange during the Hohokam pre-Classic period was tied to the ballcourt network (Doyel 1991a, 1991b) and that incipient markets were operating. This market hypothesis is supported by pottery production and provenance studies (Abbott et al. 2007).

The following research questions address the topic of Regional Exchange and Interaction:

- Where were the ceramics manufactured?
- Were the plain ware ceramics produced locally?
- What evidence is there for the local production of decorated ceramics?
- What does ceramics manufacture/production indicate about the exchange mechanisms in operation?
- What does the ceramic evidence indicate about the relationship between the site and other sites in the Phoenix area?
- What exotic artifacts are present? From where do they originate?
- What do the exotic materials and artifacts indicate about the site's participation in pan-regional or extra-regional trade networks?

- How are the exotic artifacts distributed throughout the site?
- Are only finished artifacts present? Or is there debitage from manufacture, artifacts that are incompletely finished, or items in different stages of manufacture?
- Do uneven distributions, if they exist, indicate differences in access to resources and differences in wealth or status among the site's inhabitants?
- What types and quantities of local and non-local raw materials are present?
- What indications are there of the types of exchange mechanisms in operation at the site: direct, down-the-line, or some other mechanism?

Data Requirements

To address the research questions regarding exchange and interaction, researchers should examine the types, quantities, and archaeological context of non-local items such as marine shell and obsidian. The goal is to identify those items and to determine, if possible, their region of origin. This might be accomplished through stylistic analysis and/or chemical analysis.

Temper variability in ceramics can help identify the extent and characteristics of exchange with groups outside the region. Ceramic studies using temper sourcing have resulted in significant data on the production and distribution of plain and decorated ceramics in the Hohokam region.

<u>Households</u>

Archaeologists believe that the basic unit of socioeconomic organization for the Hohokam was the household. This household would have performed numerous activities, often within the confines of a domestic dwelling, household cluster, or associated activity area (Flannery and Winter 1976; Rathje and Wilk 1982). Within household clusters, activity areas are the "spatial zones" where these domestic activities took place. At archaeological sites, "spatial zones" often show evidence of regular and repeated activities such as food processing and preparation, food storage, tool manufacture, craft production, and refuse dumping (Flannery and Winter 1976:34). As Winter (1976:25) states:

> The distinction between "household cluster" and "household" should be stressed. A household cluster consists of archeological remains, while a household consists of a group of people who interact and perform certain activities. Through analysis of the archeological data, we can reconstruct the composition of prehistoric households, compare the activities carried out by household members, and study the relations between different households.

One goal of archaeological study is to identify the activities that prehistoric peoples performed at the level of the household. Another is to look for evidence of craft production or craft specialization.

Craft production and the distribution of Hohokam goods have received much attention in the last decades. Craft production and craft economies are the processes whereby people acquired raw materials, created usable products, and consumed and distributed those products (Bayman 1999:252). Cotton fibers, textiles, buff ware ceramics, lithic materials, and prestige items such as marine shell and obsidian projectile points were produced, consumed, and distributed via various Hohokam networks (Abbott 2000; Arp and Swanson 2021; Bayman 2001; Crown 1991b).

For example, during the late Classic period, high-value goods such as marine shell ornaments and obsidian were common at the large Hohokam settlements, especially the communal platform mound centers. It is theorized that Hohokam communities did not produce these goods through attached specialization—the process by which elite groups control the production of high-status goods—but, instead, communally produced them with limited intervention from higher status individuals (Bayman 1996). Although it is difficult to locate the spatial zones where the manufacture of prestige items occurred, the concentration of these types of artifacts within specific ceremonial contexts suggests that Hohokam populations produced and consumed prestige goods in community-wide ceremonies (Bayman 1996, 1999; Foster 1994b).

The following research questions address the topic of the Hohokam Household:

- What are the archaeological correlates of the Hohokam household?
- Does the household consist of an individual house, a structure along with extramural features, or a collection of structures such as a courtyard group?
- What architectural features are present in the houses, and what do they tell us about the organization of the household economy?
- What types of storage features are present inside the houses?
- What types of extramural storage and processing features are present at the houses, and what was being stored and processed in them?
- How is organization of the household economy reflected in arrangement of household storage space?
- What types of archaeological remains are associated with households? Do these artifacts and features indicate everyday activities such as food production and processing?
- Can we identify activity areas and link them to specific households or courtyard groups? What is the evidence supporting these links?
- Were household economies specialized or generalized, and what evidence supports these conclusions? In other words, were most households self-sufficient or did individual households specialize in the production of some item or items of value such as cultigens, ceramics, jewelry, and other craft or utilitarian items?

Data Requirements

For this research issue, the assumption is that house clusters, or houses and their associated extramural features, were the residences of the members of a household. Therefore, we can use the material remains recovered from a household to attempt to reconstruct the size of that household and the subsistence and economic activities it performed. Certain activities like the preparation of food or the construction and maintenance of the shelter would have been common to each household. It is possible, though, that a household might have specialized in the production of a subsistence or craft item.

Prehistoric Canals

The Hohokam constructed the largest canal irrigation system in the New World north of Peru, one that could have irrigated up to 70,000 acres (28,000 hectares) of agricultural fields. Individual Hohokam canal systems consisted of groups of canals with a common headgate location, with irrigated fields and settlements spread alongside the canals. There were numerous canal systems on the Salt River in the Phoenix Basin, including four main systems: System 1 and the Lehi System located south of the Salt River and System 2 and the Scottsdale System located north of the river. Researchers have identified several additional canal systems north of the river—the Colinas, Tolleson, and other systems—and three systems south of the river—the Primero, Laveen, and Viejo systems **(see Figure 3)**.

Research into Hohokam canals and irrigation has a long history in Southwest archaeology (Caseldine 2020a; Howard and Woodson 2018; Woodson 2022). Some of the most significant early work was done by Omar Turney (1924, 1929) and Frank Midvale (1968), leading to current maps of the network of prehistoric canals in the lower Salt River Valley (Howard and Huckleberry 1991:Figure 1.1; Howard and Woodson 2018). This early research also included aerial survey and photography of the prehistoric canals in the valley (Halseth 1936; Judd 1931). Canals were later investigated at AZ U:13:1(ASM) (Haury 1976) and at AZ U:9:1(ASM) (part of S'eḏav Va'aki and formerly known as Park of the Four Waters) (Woodbury 1960). As Howard and Woodson (2018:114) pointed out, passage of the NHPA and the Section 106 process resulted in funding for cultural resource management projects and greatly increased our knowledge of ancient canal irrigation in Arizona (e.g., Ackerly and Henderson 1989; Ackerly et al. 1987; Howard and Huckleberry 1991). Since 1980, many of the studies of Hohokam irrigation have been funded by ADOT and FHWA projects (Howard and Woodson 2018:116). The COP, too, has sponsored significant work in this area of study, particularly along the western edge of S'eḏav Va'aki (Henderson 2015, 2019). There, archaeologists have identified main and lateral canals, a water-control feature, canal-side basins and reservoirs, and even field areas delineated by small canals and ditches.

Irrigation and agricultural practices continued from the Hohokam era through the post-Classic/Protohistoric and early-to-mid-Historic periods, including Jack Swilling's Irrigation and Canal Company in the Salt River

Valley in the 1870s, the Salt River Valley Water Users' Association in 1903, and the Salt River Project Agricultural Improvement and Power District in 1936. The Akimel O'Odham were well aware of their *Huhugam* ancestors, and it is reasonable to assume that their continued use of prehistoric canal alignments was not simply a coincidence (DeJong 2011:12; Russell 1908:87). Upon their arrival in the region, the Piipaash began floodwater farming along the washes, sloughs, and floodplains associated with the Gila River and the tributary Vekol and Santa Cruz washes. The Piipaash and their O'Odham neighbors constructed and maintained their own canals for irrigation and in many instances did so cooperatively.

The following research questions are pertinent to the study of prehistoric irrigation agriculture in the Phoenix Valley:

- What canals or remnants of prehistoric canal systems are preserved?
- How were prehistoric canals constructed?
- What are the ages of the canals?
- When were the various canal segments constructed?
- What specific tools—survey equipment—can be identified that were used to lay out canals?
- What were the use-lives of the canals and canal systems?
- What were the patterns of growth and abandonment of the canal systems?
- Is there evidence of features such as settling ponds and reservoirs?
- Can the locations of agricultural fields be identified?
- How did irrigation agriculture at the site change over time?
- When did irrigation agriculture begin in the Phoenix Basin?
- Can water-control features such as weirs and headgates be identified?
- What were the environmental settings in which the canals were constructed?
- How did the construction of the canals alter the local environment?
- Can patterns in canal layout be used to identify the locations of agricultural fields?
- What are the hydraulic characteristics of the canal designs and flow?
- Based on the estimated flow of the canals, what is the amount of land that could have been irrigated?
- Where are the irrigated lands located relative to the settlements?
- Based on the estimates of irrigable land, what was the size of the population?

Data Requirements

Data to address the research questions presented above can be derived from four sources: (1) archival and geomorphological research to identify and locate possible canal alignments in the project area;

(2) mechanical excavations to ground-truth the projected canal alignments, to discover unknown canal alignments, and to trace the confirmed canals through the project area; (3) documentation of exposed canal cross-sections through mapping and photography; and (4) sampling to collect sediments from selected canals for specialized analyses, including particle size analysis and ostracode (microscopic crustacean) analysis. Samples can also be analyzed for ascertaining the ages of canals (e.g., radiocarbon analysis and OSL dating).

Historical Sites Research Design

Four themes have been developed to guide research at historical sites in the city of Phoenix. Each historical research theme is designed to structure and guide archaeological and archival studies and analyses. The research themes presented below are as follows: (1) Community Structure and Development (Land Use and Development of Space); (2) Commodity Research; (3) Ethnicity, Race, Class, and Gender; and (4) Historical Irrigation in the Greater Phoenix Area. These broad research themes and questions were derived from Lindly (2005).

Community Structure and Development (Land Use and Development of Space)

The city of Phoenix developed from a small farming community to a sprawling metropolis between the nineteenth and twentieth centuries. Over time, as the city expanded away from the original townsite, new architectural styles, neighborhoods, and transportation networks were established, each characteristic of the period in which it was developed (Lindly 2005). The following questions are intended to guide research on communities, residential spaces, and transportation networks.

- What are the current and past land uses in the project area or area of potential effects?
- How was the land organized spatially in the project area or area of potential effects (e.g., homestead, farm, formalized neighborhood subdivision, plat)?
- What features are present, when were they constructed, and what land uses do they represent? What materials were used in their construction? Were these materials locally produced or imported?
- What archival records exist and what information do they provide about the project area or area of potential effects? How does the information contained within these archival records compare to the archaeological record?
- What is the relationship between the project area or area of potential effects and the surrounding area and the city overall? How has this relationship changed over time?
- What cultural traditions are represented in the project area or area of potential effects?

- Are features in the project area or area of potential effects representative of responses and/or adaptations to the natural environment?
- Is vegetation in the project area or area of potential effects related to historical land use in Phoenix?
- How did individuals move through the project area or area of potential effects? What transportation features are present and how do they relate to larger networks in the city? Do they reveal anything about greater circulation patterns?

Data Requirements

The types and location of historical features in a project area can provide abundant information on community structure and development. Depending on the physical condition of those features, they can inform on the types of activities that were occurring at a particular location; access to materials, goods, and services; relationship to the surrounding community; and sometimes ethnicity and gender. Information can be obtained through artifact analysis; field documentation of the construction and design of both standing and partially standing features such as buildings, irrigation systems, and other structures; and archival research. Field documentation and artifact analysis can be supplemented by a review of historical maps (including homestead patents, Sanborn Fire Insurance maps, and subdivision plats) and historical aerials. In addition, oral history interviews and genealogical research can shed light on the identities, occupations, and relationship to the community of those previously occupying the project area.

Commodity Research

Commodity research questions address the artifacts and material goods that may be observed in a project area or area of potential effects. Artifacts can provide unique information about the way a space was used, when it was occupied and by whom, and how its use changed over time (Lindly 2005). The following questions are intended to guide research on historical materials, materials networks, chronology, and identity.

- What artifact types are present in the project area or area of potential effects? What is the artifact density?
- What functional categories are represented in the assemblage and what do they tell us about historical activities (e.g., domestic, industrial, and agricultural) in the project area or area of potential effects (see South 1977 for an explanation of functional categories)?
- What consumer goods manufacturing networks are represented in the assemblage? Where were the artifacts produced? Do any of the artifacts represent locally produced consumer goods?
- Do the artifacts indicate the economic status of the people occupying the project area or area of potential effects? Do the artifacts reveal anything about the employment of the people in the project area or area of potential effects? Is there any evidence of the reuse, repair, or recycling of artifacts?

- Do the artifacts indicate anything about the age, gender, or ethnicity of the people in the project area or area of potential effects? Do the artifacts reveal the presence of any other cultural groups (e.g., religious affiliation, fraternal societies, and labor unions). Is interaction between more than one ethnic or cultural group visible in the assemblage?
- What chronologically diagnostic artifacts are present? What do they indicate about the period(s) of occupation of the project area or area of potential effects? Does the artifact assemblage help to refine our chronological understanding of the project area or area of potential effects?

Data Requirements

Depending on the types and quantities of artifacts in the project area, data needed to address the research questions under this theme can be obtained through the analysis of Historic period artifacts. In instances in which artifact density and diversity are low, commodity exchange can be analyzed through research on neighboring commercial, agricultural, and industrial properties and proximity to transportation corridors. If standing buildings are present, the materials, design, and style of these buildings can shed light on access to goods and services, the social status of the occupants of the site, and the popularity of certain cultural trends and patterns as expressed by specific architectural styles.

Ethnicity, Race, Class, and Gender

Ethnicity, race, class, and gender are important analytical lenses through which historical communities can be studied. Membership in these social categories shaped the lived experiences of people in the past as well as the archaeological and documentary records they produced. These social categories may be reflected in the consumer goods purchased and discarded, the foodstuffs consumed, the organization of public and private spaces, the locations of communities, adaptations to the landscape, and the types of labor and industry performed (Lindly 2005).

The following questions will help guide historical and archaeological research on Ethnicity, Race, Class, and Gender.

- What do the features, artifacts, and/or historical records tell us about the ethnicity, class, and gender of the occupants of the project area or area of potential effects?
- Was the project area or area of potential effects historically associated with a known religious, ethnic, or racial community? Did the religious, ethnic, or racial makeup of the project area or area of potential effects change over time?
- Do documentary records indicate cultural traditions or responses to the natural environment that correlate with a specific ethnic group?

- Are archival documents available that provide information on the race, class, ethnicity, and/or gender of the occupants of the project area or area of potential effects (e.g., city directories, newspapers, census data, maps, land entry files, neighborhood codes, covenants, restrictions, city ordinances, and photographs)?
- Do extant documentary records and the archaeological record give similar or contrasting data on the project area or area of potential effects regarding the race, class, and ethnicity of the community's occupants?

Data Requirements

Evidence of race, class, and gender can sometimes be hard to extrapolate from the material record. Interpretations of these themes should not rely entirely on artifact analysis. While artifacts can often get at questions of class and gender, race is much more complicated and can lend itself to unintentional bias. Coupled with Historic period artifact analysis, archival research related to codes, covenants, and restrictions associated with subdivisions; census and demographic data; telephone directories (early directories indicated race); and newspaper articles can help address questions of race, class, and gender. Oral history interviews with informants who have knowledge of historical communities are another avenue of research.

Historical Irrigation in the Greater Phoenix Area

As discussed earlier, Phoenix was officially incorporated as a small farming community in 1870 following the rehabilitation of the prehistoric canals and ditches in the late 1860s (Luckingham 2016:13–15; Vandermeer 2012:14). Historical canals frequently followed their prehistoric predecessors and were integral in providing water to farmers, who were cultivating both imported and native crops. As neighborhoods developed outward from the central business district, they often followed the paths of the established canal systems, and canals frequently connected historical neighborhoods. In a sense, the canals not only provided water for agricultural fields but also spurred the development of new neighborhoods, landscaping, and recreational spaces. In recent years, recreational and commercial businesses have been constructed parallel to the Grand and Arizona canals, demonstrating the ongoing cultural importance of Phoenix's historical canals.

The following research questions are intended to guide historical and archaeological research on historical irrigation features:

- Are the physical remains of early pioneering canals still intact in the city of Phoenix, project area, or area of potential effects?

- Does the archaeological or documentary evidence indicate that the historical pioneering canals in the project area or area of potential effects follow or closely parallel the pathways of the prehistoric canals?
- Are associated canal features such as culverts and diversion devices present?
- Are there indications of canal realignments and/or modifications over time?
- What were the sizes of the main canals? Did channel size vary?
- What was the estimated discharge of each canal and did that discharge fluctuate?
- Can we determine who had rights to a particular canal? Was the water equally distributed to all farmers along each canal?
- Can periods of drought or flooding be documented by analyzing canal sediments and/or documentary records?
- How far was water distributed from the main canals?
- Can episodes of canal construction or repair be identified?
- Can canals in the project area or area of potential effects be tied to irrigation systems composed of one or more main canals, distribution canals, and lateral canals?
- How did irrigation systems compete for water?
- How well built were the diversion devices and other canal features?
- Were the features able to withstand episodic flooding or drought?
- Can episodes of canal flooding or drought be recognized in the failures of homesteads and farmsteads?
- Can we document the change over time of the canal system(s) in the area?
- How did the canals and the area evolve over time?
- Who were the landowners using the canals in the project area or area of potential effects?

Data Requirements

Because it is atypical to find high concentrations of artifacts associated with historical irrigation canals, archival research and accurate field documentation of irrigation features are necessary to address the research design questions. Archival research can include historical irrigation maps, General Land Office maps, SRP Research Archives, historical aerial photographs, homestead land entry files, and newspaper articles. Additionally, field documentation should include sufficient photography to illustrate the canal features; measurements of length, depth, width, and elevation; a description of construction techniques; evidence of remodeling or repair; and descriptions of any subfeatures associated with the canal such as headgates. Lastly, documentation should include the notation of any stamps or other inscriptions.

WORK PLAN

Preparation

Project-specific Scope of Work Addendum

Each project that uses the HPTP must submit a project-specific addendum that includes any deviations from or amendments to the plan. The HPTP Addendum Form is available in **Appendix A** of this document and can be downloaded from the COP webpage. It includes consultant and project information, previous research conducted, identified research design, approach to any archival or historical research needed, site-specific work plans, safety plans, plans for how to proceed in the event of no findings, insignificant findings, or significant findings, and schedules and requirements for project updates and deliverables.

The HPTP Addendum Form should also be accompanied by maps of the project area boundary on a USGS topographic quadrangle background and previously conducted survey projects and previously recorded archaeological sites in the project review area. Additional maps or graphics should be added as applicable.

Permits

The consulting archaeologist must obtain all the necessary permits required for investigations conducted under this HPTP. If the project is being conducted on COP-owned or -controlled land and is within the ASM recorded boundary of a site or within the ASM recorded path of a prehistoric or historical canal, then an AAA project-specific permit from the ASM will be required. When using an AAA project-specific permit, consultants must ensure that a results report is submitted to the ASM Permit Office for review. If the request comes from the lead agency, the ASM will conduct a concurrent 30-day review. If the request is from the consultant, a 30-day review is not guaranteed. Unless otherwise required by law, the project-specific permit application should specify the S’ed̲av Va’aki Museum as the repository for curation. A project-specific permit is not required if the project is outside ASM site boundaries. When a project is located within a 250-foot buffer zone surrounding a site or within a 50-foot buffer zone surrounding a canal, an AAA project-specific permit is not required. However, if a site or canal is found during the execution of the project, an AAA project-specific permit will immediately be requested from the ASM.

For projects conducted on federal fee land within the COP, ARPA and NAGPRA will apply. Prior to conducting fieldwork, an ARPA permit must be issued by the applicable federal agency and a NAGPRA Plan of Action must be developed and approved.

Unless otherwise required by law, all project-related materials from investigations conducted under the guidance of this HPTP must be curated at the S’ed̲av Va’aki Museum. The archaeologist must request a repository agreement for the project from the S’e̱dav Va’aki Museum, and the agreement must be obtained prior to the start of the project.

All projects conducted under this plan must adhere to the requirements of the Maricopa County Dust Control Plan (Maricopa County Air Quality Department 2008). Depending on the size of the ground disturbance associated with the project, a Maricopa County Dust Control Permit may be required. All appropriate dust-control measures must be taken during the project.

If a project is to disturb more than 1 acre of land, an Arizona Pollutant Discharge Elimination System (AZPDES) or a National Pollutant Discharge Elimination System (NPDES) permit will need to be obtained. For all land jurisdictions other than Tribal, the AZPDES permit would be issued by the Arizona Department of Environmental Quality. For Tribal land, the NPDES permit would be issued by the U.S. Environmental Protection Agency. To obtain either permit, a Storm Water Pollution Prevention Plan and a Notice of Intent must be submitted to the appropriate agency for review and approval. AZPDES and NPDES permits are not required for projects that disturb less than 1 acre of land.

Records Review

For all projects, a S’e̱dav Va’aki Museum records search must be conducted within a 0.5-mile buffer around the project area. A records search must also be conducted at the ASM Archaeological Records Office and via AZSITE. A figure should be included in the project-specific addendum showing all previously recorded archaeological sites within 0.5 mile of the project area and all previously conducted survey projects intersecting the project area, unless otherwise directed by federal or state lead agencies.

Historical Sites Records Review

For historical sites, site-specific archival research should be conducted to collect information that will help guide the implementation of fieldwork before and during the project and aid in the understanding of the results of the archaeological work. Archival research provides an additional means of collecting important information about the past as historical documents can illuminate the important events, persons, developments, and technologies in action within an archaeological site, project area, or area of potential effects. Archival research conducted prior to and during a project should consider a broad range of primary and secondary sources.

Primary source review may include federal records like General Land Office plats, Mineral Survey plats, USGS quadrangles, and USGS reports and bulletins as available. State documentary archives containing photographs, maps, city directories, biographical information, club and society records, ranching and agricultural records, oral history recordings, newspapers, and other ephemera can be found at the State of

Arizona Research Library in Phoenix and the Arizona Historical Society archives in Tempe and Tucson. The ephemera collections held by the Arizona Historical Society cover a broad range of topics, including documents useful for the study of women and ethnic communities in Arizona. In addition, the Arizona State University Library in Tempe offers a large collection of historical documents and oral histories with a special focus on Latin, Mexican American, and Indigenous peoples. Where appropriate, local archives and historical societies should also be consulted for pertinent records. Digital archives like Ancestry.com and the Arizona Genealogy Record Search may provide useful genealogical records. The Library of Congress website has Historic American Building Survey records, Historic American Engineering Record records, and many Sanborn Fire Insurance Maps. These are available online or by request. Similarly, the Arizona Memory Project, a virtual repository that offers a wide variety of primary source materials, has digitally curated government records, maps, photographs, and oral history audio files. Finally, aerial imagery and property records are often available digitally through Maricopa County GIS's and Maricopa County Assessor's portals, respectively. While not an exhaustive list, the following resources have been included here for ease of reference:

- Ancestry: https://www.ancestry.com
- Arizona Genealogy Record Search: https://www.azdhs.gov/licensing/vital-records/genealogy/index.php
- Arizona Historical Society: https://arizonahistoricalsociety.org
- Arizona Memory Project: https://azmemory.azlibrary.gov
- Arizona State University Digital Repository: https://repository.asu.edu
- Library of Congress: https://www.loc.gov/
- Maricopa County Assessor: https://maps.mcassessor.maricopa.gov/
- Maricopa County GIS: https://gis.maricopa.gov/GIO/HistoricalAerial/index.html
- COP Story Maps: https://www.phoenix.gov/pdd/story-maps

The secondary source review for historical sites should include popular and scholarly publications of relevance to Phoenix, Phoenix communities and neighborhoods, and people and places of historical significance. A/NRHP nominations may be reviewed as needed as they offer pertinent information on historical properties and districts within the city. The SHPO offers a research guide for historical archaeology in Arizona (https://arizona-content.usedirect.com/storage/gallery/pdf/SHPO_2013_Historical_Archy_Guide.pdf) as well as thematic historical context studies that may prove useful and should be reviewed and incorporated as appropriate (https://azstateparks.com/shpo-context-studies). Finally, new digital secondary sources are always becoming available and should be reviewed as appropriate. For instance, the COP has developed a series of story maps and videos documenting historic preservation efforts and multicultural histories within the city. In sum, a broad range of both primary and secondary resources are available that may be relevant to a project, project area, or area of potential effects. These resources should be considered and thoroughly examined in conjunction with archaeological and field-recorded data.

Oral History

Oral history interviews may be conducted if informants are identified who have knowledge of the area or who may have lived or worked at or in the vicinity of historical sites. If potential informants are identified, interviews should be conducted to address the research questions pertaining to chronology, site function, and the identities of the people living and/or working in the area. If interviews are conducted, consent forms should be drafted stating the intended use of the information and signed by the informants.

FIELD STRATEGIES AND METHODS

General field strategies for eligibility testing, boundary testing, Phase I data recovery, and Phase II data recovery are presented in this section. Following these general strategies is a section detailing the specific field methods applicable to testing and data recovery investigations. The field methods presented are intended to cover the investigation of cultural resource sites, including canals.

Traditional subsurface exploratory methods such as vertical trenching, strip trenching, and hand-excavation units have proven effective in obtaining data expeditiously; therefore, they are the primary field techniques that will be used for most testing and data recovery investigations. New and innovative methods, if applicable, should also be considered and discussed with the City Archaeologist prior to submitting a project-specific Addendum Form for review.

Monitoring is considered a viable alternative to testing and data recovery in certain situations where project ground disturbance would be less destructive to cultural resources than archaeological excavations and would follow the *General Monitoring and Discovery Plan for the City of Phoenix, Maricopa County, Arizona* (Henderson 2020 or the most recently updated version). If monitoring is determined appropriate instead of testing or data recovery, any specialized techniques that may be necessary for documenting and evaluating subsurface features within large-scale trenching projects, including stepping, shoring, and the filling in of trenches to adequate safety levels, need to be discussed and cleared with the appropriate COP department and construction companies prior to fieldwork. Any ongoing monitoring program should be periodically evaluated to determine whether the results warrant continued monitoring, including feature presence or absence, amount of previous disturbance, and ability to observe cultural features with the construction techniques being used. The *General Monitoring and Discovery Plan for the City of Phoenix, Maricopa County, Arizona* (Henderson 2020 or the most recently updated version) should be consulted as part of this decision.

This revised HPTP is for archaeological testing and data recovery. However, monitoring is often needed following data recovery where additional ancestral remains (human remains) might be present. This monitoring should follow the general monitoring and discovery plan referenced above, along with the BDA and any updated protocols or standards that have been implemented subsequent to the 2020 monitoring and discovery plan.

All field methods used must conform to applicable professional standards and policies. These include the *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (National Park Service 1983); the *City of Phoenix Guidelines for Archaeology* (COP 2020a); *SHPO Position on the Roles of Archaeological Testing* (Bilsbarrow 2003); the *Rules Implementing A.R.S. § 15-1631 and § 41-841, et seq.*, *the Arizona Antiquities Act*; the *Rules Implementing A.R.S. § 41-865 Disturbing Human Remains or Funerary Objects on Lands Other than State Lands*; the ASM's *A.R.S. § 41-844 AND § 41-865 Guidelines,* and any future applicable COP, ASM, or SHPO field standards, guidance, or policies. Per COP regulations, a copy of the COP guidelines document should be kept on site during all fieldwork. The COP Archaeologist must be notified of any projects involving cemeteries or areas within historical overlay zoning.

Arizona/National Register of Historic Places Eligibility Testing and Boundary Testing

The purpose of eligibility testing is to evaluate the eligibility of a cultural resource site for listing in the A/NRHP and, if it is found eligible, to obtain sufficient information from the site to develop a data recovery plan. This information may include the condition, integrity, type, distribution, and density of subsurface features and the age of the site. Eligibility testing methods are designed to determine if significant cultural resources are present that would allow for an evaluation of eligibility based on the criteria presented below. A/NRHP eligibility testing is only applicable to state and federal projects. It does not apply to city or private projects. However, some city- and privately funded projects may involve A/NRHP evaluations at the discretion of the project sponsor and/or the COP.

The significance of a cultural resource is evaluated according to standards issued by the National Park Service (1991). According to these standards, cultural resource properties are eligible for listing in the NRHP if they retain significance and integrity. Per the standards:

> the quality of significance in American history, architecture, archaeology, 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.

The ARHP criteria match those of the NRHP but are applied at the state level. The SHPO has stated its position on the role of eligibility testing and the extent to which any site subjected to eligibility testing should be disturbed (Bilsbarrow 2003 and associated SHPO FAQs). In this position statement, the SHPO maintains that the lowest possible effective percentage of the site area be disturbed when conducting eligibility testing. Therefore, all eligibility testing conducted under this plan should be structured to result in the most minimal disturbance while obtaining the information necessary to assess the eligibility of the site.

In the city of Phoenix, eligibility testing typically involves the excavation of backhoe trenches. Trench patterns for testing projects in the city should sample between 1.5 and 3.0 percent of the site area—the trenching pattern should not exceed a 3.0 percent sample. Exceptions may be made for small parcels and lots in which the excavation of a single trench exceeds the 3.0 percent maximum.

Boundary testing might also be conducted. The purpose of boundary testing is to determine the boundary of an archaeological site based on the extent of buried features and deposits rather than just the distribution of surface artifacts.

Phase I Data Recovery

The purpose of Phase I data recovery, sometimes referred to as "testing," is to provide detailed information on the nature, extent, and distribution of features and artifacts at A/NRHP-eligible sites so that accurate Phase II data recovery plans can be developed. By gathering such information, archaeologists can focus on those portions of a site that are most likely to yield data pertinent to the research design guiding the project. Phase I investigations in the city of Phoenix typically involve more extensive trenching patterns than eligibility testing and examine a greater portion of the site area. If eligibility testing has been previously conducted at the site, data from those investigations can be used to augment the data from Phase I and in some cases lessen the amount of work that is required during Phase I.

Phase I investigations can result in a finding that no further data contributing to the A/NRHP eligibility of the site are present or are likely to be obtained through further work. Such a finding, if agreed upon by the COP, the SHPO, and, for projects under the jurisdiction of an AAA permit, the ASM, will usually result in a recommendation that no further work needs to be conducted at the site. Data recovery will follow testing if necessary.

Phase II Data Recovery

The purpose of Phase II data recovery is to recover significant data from an A/NRHP-eligible site to inform the research domains and questions presented previously in this plan. Phase II data recovery will follow eligibility testing and/or Phase I data recovery and use the information obtained from those previous investigations to prepare a detailed strategy that focuses on the areas and feature types that have the most potential to contribute to the relevant research domains.

Phase II data recovery in the city of Phoenix generally consists of limited trenching or the reopening of previous trenches, mechanical stripping to remove overburden and expose features in plan view, and hand-excavation of a sample of the features present. The sample size will vary by site and feature type and will be addressed in the project-specific addendum outlining the project strategy for COP approval.

Field Methods

The following sections review and provide details about the field methods to be implemented during data recovery to recover artifacts, specimens, and samples and to provide a documentary record of these studies.

Safety Plan

A dedicated Safety Officer should be identified by all organizations conducting fieldwork under this HPTP, and a safety plan that addresses fieldwork, transportation, worker heat safety, and public safety issues should be prepared prior to fieldwork for all testing and excavation projects. The Safety Officer should review Occupational Safety and Health Administration (OSHA) regulations with all senior archaeology staff members prior to the start of fieldwork, particularly 29 Code of Federal Regulations (CFR) 1926.650, 29 CFR 1926.651, and 29 CFR 1926.652, which pertain to trench excavation. OSHA standards will be followed for all work activities, including trench depths. *Arizona 811!* should be contacted to identify underground utilities prior to any excavation. One or more senior-level field personnel should be designated as the "competent" person as specified by OSHA. This person will be responsible for providing safe working conditions in the field in the interest of employees, the public, and the cultural materials uncovered. First aid equipment should be readily available to all employees in the field, and regional hospitals should be identified in advance of the project.

Where practical, fencing may be erected around cultural resource sites while archaeological work is in progress. Where upright fencing is not practical, individual fence panels may be laid horizontally over open trenches to form a barrier. Lath may also be installed around the perimeter of each site and connected with yellow caution tape to form a visible barrier to the open excavations while fieldwork is in progress. In addition, at the end of each field day, trenches and other open excavations should be marked with barricades to ensure that they are visible. If deemed necessary, a qualified security guard may patrol the accessible portions of the project area during non-work hours when field crews are absent from the sites. In addition, the local police department and county sheriff's office should be informed of the project prior to fieldwork, and a request should be made for additional patrolling of the project area.

Surface Collection

It is the preference of some Tribes that artifacts not be collected from the surface and instead be left in place. This preference must be considered and respected.

Surface collection should be determined on a case-by-case basis in consultation with the COP Archaeologist based on factors such as the presence of intact natural ground surface, potential for buried deposits, and the artifact assemblage present. There are some places in the city where surface collection may be appropriate (e.g., sites on undisturbed land in mountain preserves where buried features are less likely). Conversely, many of the projects conducted in the city of Phoenix will be in areas where the surface has been highly disturbed by modern development, obviating the necessity of collecting surface artifacts.

Surface collection methods, if needed, will vary depending on the specific site but should be designed to provide horizontal data on artifact distribution and density at each site. Methods should be discussed in the HPTP Addendum Form. At smaller sites and sites with low-density artifact scatters (i.e., less than an estimated 100 artifacts), all surface artifacts should be collected and provenienced to the site. Collections at sites with distinct loci may be provenienced to each locus. If determined to be appropriate based on site size or artifact complexity, collections may be provenienced to halves or quarters of the site, or the site may be divided into sample collection units (5 by 5 m or 10 by 10 m) and provenienced in this manner. Unique and diagnostic artifacts at all sites should be collected and point-provenienced. All artifacts from surface features will be collected.

When not in conflict with any state requirements and when there does not appear to be a sound reason to collect surface artifacts on a particular project, then it is advisable not to collect them and to provide support for this decision in the work plan addendum.

Mapping and Spatial Control of the Archaeological Record

Spatial control of the archaeological record is fundamental to every aspect of the archaeological record, from the placement of items on a structure's floor to the interaction of communities across the greater Southwest. A precise understanding of site locations and boundaries is also vital in today's strictly controlled system of land division and the legal rights and responsibilities associated with land ownership.

A detailed map of each site should be prepared showing the site boundary, cultural features, artifact concentrations, and unique or diagnostic artifacts. The map should also show the locations of all backhoe trenches, excavation units, and stripping areas as well as topographic features, modern features such as roads, buildings, utility poles, and utility lines, and areas of disturbance.

To maintain tight spatial control of all fieldwork, archaeologists should use hand-held Global Positioning System (GPS) and total station units with submeter accuracy and GIS software to maintain maps of all the surface collection and excavation units, features, and points of interest identified during the excavations. Archaeologists should establish a primary datum at each site to provide vertical and horizontal metric control. Horizontal coordinates should be measured relative to the UTM grid, and vertical elevations of the datums should be established relative to a single vertical scale. Supplemental control points should be established as needed and referenced back to the main datum at each site. Archaeologists should establish metric control grids over each site to provide additional horizontal control for surface collections and as a reference grid to guide the placement of exploratory trenches.

Features excavated at a site should be hand-mapped, and each map should have at least two control points (i.e., mapping nails). The horizontal and vertical positions of these control points should be mapped relative to the primary datum and site grid using a total station or other up-to-date instrument or a GPS unit. Hand-drawn maps should be digitized and integrated into the overall site map using these control points. The resulting computer-generated maps should be field-checked for completeness and accuracy and later professionally produced for use in the final report. Updated working field maps should be maintained throughout the field season showing the progress of the excavations, including all exploratory units, cultural features, and site boundaries.

Field Recording and Photography

Archaeologists should document the data recovery operations using high-quality digital photography. Overview photographs should be taken of the sites, the mechanical stripping units, and the features prior to, during, and following excavation. The only exception to this photographic documentation policy is the recovery of mortuary features. Archaeologists must not photograph any human remains, funerary objects or artifacts, known sacred ceremonial objects, or objects of national or Tribal patrimony. Archaeologists are responsible for prohibiting others from taking photographs of human remains, funerary objects, known sacred ceremonial objects, or objects of national or Tribal patrimony. If photographs are taken of features or artifacts later determined to be mortuary features or funerary objects, those photographs must be deleted from all media as soon as possible. Sacred ceremonial objects and objects of national or Tribal patrimony should only be photographed with the consent of the claimant Tribe.

Archaeologists should maintain logs of all photographs that document the project name, frame number, site number, subject, orientation, date, and full name of the photographer for each photograph. In instances where photograph locational information may not be clear by the subject and orientation of the photograph, UTM coordinates of the photo-point location should be recorded in the log. Wherever possible, metric scales, north arrows, and descriptive “mug boards” should be used in all feature and artifact photographs to provide a frame of reference.

Digital images should have a minimum resolution of 24-bit 1600×1200 pixels per ASM standards (Griset et al. 2004). At the end of each field session (weekly), photographs should be downloaded from cameras and saved in JPEG format on a secure server. Field photologs should be scanned weekly, and PDF copies should be saved with the photographs. Photographs selected for use in reports or presentations may be cropped or rotated, and digital scale bars or callouts may be added. The original unedited photographs should be submitted for curation, but some saturation or color modifications may be made to enhance report photographs such as photographs of faint rock art elements. All digital photographs should be handled and processed per applicable curation facility standards and submitted as part of the collection for curation (e.g., ASM 2023b; COP 2020b; Griset et al. 2004; or most recent applicable updates).

Other field documentation should include the use of standardized forms and hand-drawn maps. Archaeologists should use a uniform set of forms to document all excavations. These forms should be designed to capture the data and information necessary to preserve the provenience and observable characteristics of the archaeological deposits and features. The original field forms should be submitted with the artifacts and other project materials for curation.

Trenching

The purpose of exploratory trenches is to determine the presence, condition, and distribution of cultural features and deposits and to define study areas for additional investigation. Archaeologists employ three different trench types: (1) vertical trenches, (2) strip trenches, and (3) hand trenches. As defined below, each type is appropriate for a particular physiographic setting and the expected nature of the archaeological deposits, whether they are distributed vertically through several stratigraphic and occupational horizons or horizontally across an old soil surface or horizon that predates human occupation. Using a combination of vertical, strip, and hand trenches provides an archaeological tool set to identify buried cultural deposits and to provide specific information about the sedimentary record. Typically, the backdirt or spoils piles from trench excavations will not be screened unless human remains are identified, but a grab sample of artifacts may be collected from the backdirt. Any temporally diagnostic or rare items will be collected.

Vertical trenches are appropriate for physiographic settings such as Holocene floodplains, terraces, and alluvial fans where the archaeological horizon may be deeply buried or where several archaeological horizons are present, one above the other. These trenches provide an opportunity for excavators to observe archaeological features and cultural horizons within the context of the natural sedimentary record. They also provide the exposures necessary for the project geomorphologist to assess the physiographic, sedimentary, and pedogenic context of the site and its cultural materials. The disadvantages of this trenching method are that the trenches provide limited horizontal exposures, making reliable estimates of feature density difficult. In addition, the trenches are destructive to archaeological features as these are sectioned by the trench and exposed in profile. Vertical trenches are also appropriate for exploring and defining deeply stratified deposits. Episodes of sediment deposition may obscure all but the most recent cultural features. Vertical trenches should be excavated using a backhoe. Deep trenches beyond 1.5 m may be excavated in some areas. All deep trenches should be excavated in compliance with OSHA regulations for crew safety.

Strip trenches are a useful exploratory excavation technique in physiographic settings where (1) Pleistocene sediments and soils predating human occupation lie close to the modern ground surface and (2) cultural features and deposits are horizontally distributed. Strip trenches are wide, shallow excavations designed to quickly identify cultural features close to the modern ground surface. Such trenches are best used in combination with vertical trenches. This type of exposure is less destructive to the archaeological features because they are exposed in plan view. The disadvantage of this horizontal exploratory method is that it does not reveal the depths of the archaeological deposits. Strip trenches are most effective at providing estimates of the variety and density of cultural features. A backhoe equipped with a custom-made stripping blade or a 1.5-m-wide mucking bucket should be used to excavate strip trenches.

Hand trenches are useful in small, confined areas where backhoe access is not possible and it is necessary to quickly and efficiently define the horizontal bounds of archaeological features and to test for stratified deposits. Hand trenches can be excavated with a pick, shovel, trowel, or other appropriate hand tool. The length and depth of each hand trench will be task appropriate, and hand trenches will be excavated to whatever dimensions are required. Most hand trenches will measure about 0.5 m wide, but the width may vary depending on the circumstances.

Regardless of the type of trench employed, a similar documentation protocol should be followed. The location and orientation of each trench should be mapped **(Figure 5)**. The trench's walls and floor should be scraped (faced) using shovels, trowels, brushes, leaf blowers, or other appropriate tools to examine the trench exposures for evidence of archaeological features. At a minimum, the investigating archaeologist should document on a provenience record form the location of the trench, its dimensions and orientation, a description of the natural and cultural strata identified in the trench profile, the nature and extent of any disturbance to the strata, and a full listing of any identified or suspected cultural features within the trench. Sketch drawings of the locations and depths below the modern ground surface of all features exposed in the trench walls should be included with the record. Each cultural feature should be assigned a unique identifying field feature number by the field director. The features identified in the trench walls should be documented as set out in the protocols below.

Areal Exposures – Horizontal Excavation (Mechanical Stripping)

Once the locations and concentrations of cultural features are defined, the next step is to expose the occupational living surface, specifically the areas between and surrounding the discovered features. The objective of these areal exposures is to remove the overburden and expose the occupational area, including the structures and facilities that represent the archaeological expression of the occupation. The removal of the overburden can be accomplished either through mechanical stripping using a backhoe, loader, or other pieces of heavy equipment such as a large excavator or by hand. The field director should select the most appropriate method for removing the overburden in each circumstance.

Mechanical Stripping Units (MSUs): These units are broad, shallow excavations used to remove the overburden and expose the occupational surface and its associated features. Using this method, features are exposed in plan view, and it is often relatively straightforward to distinguish different categories of features based on their shape and size. These broad areal exposures are critical to the study of settlement patterns.

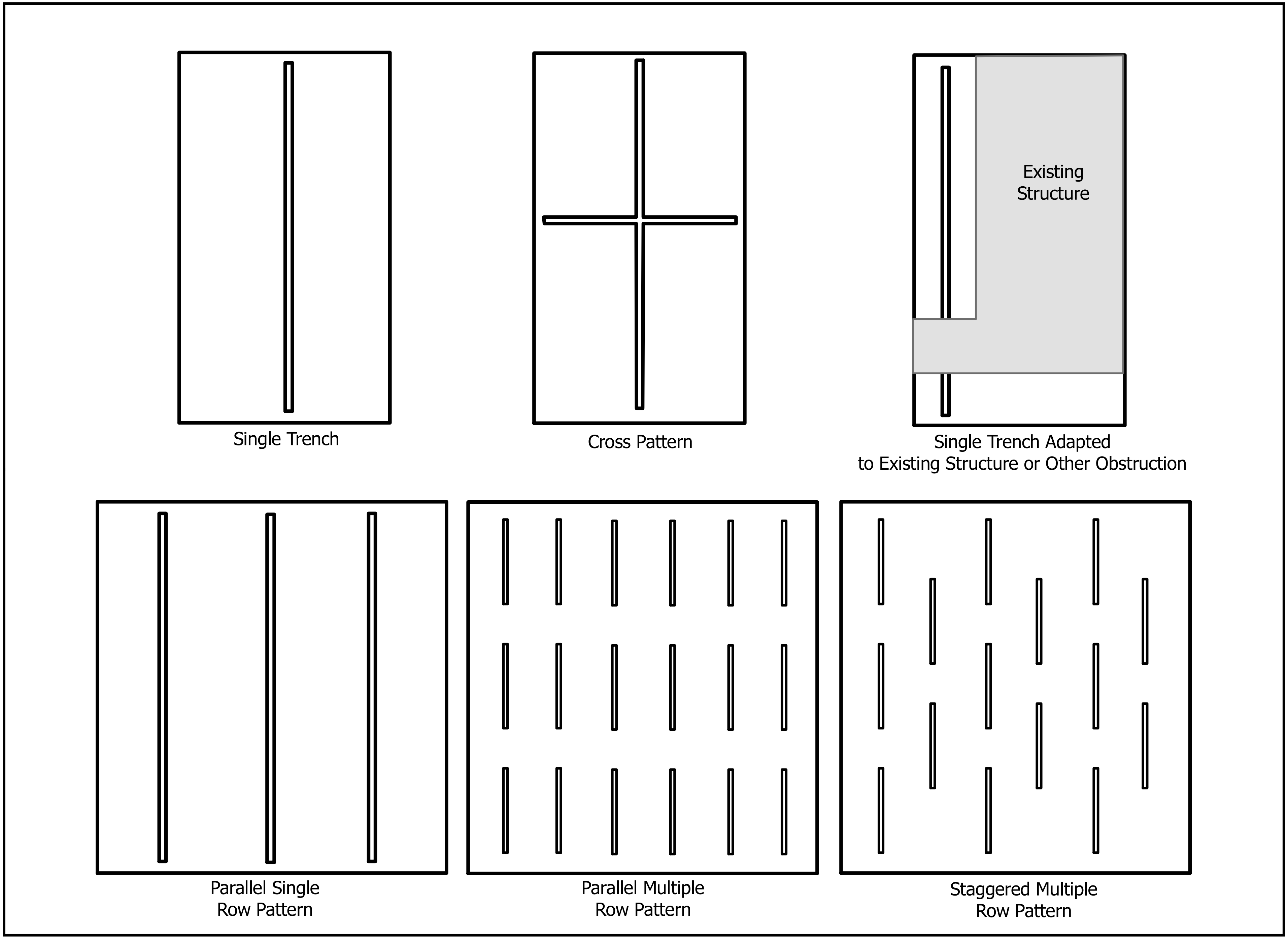

Figure 5. Examples of trenching patterns (not to scale)

The bounds of the excavation area should be defined by the pattern of features observed in the exploratory trenches and additional features discovered during horizontal stripping. MSUs typically measure 20 m on a side, although their size and shape can vary. Excavation equipment should be equipped with a specially modified stripping blade for mechanical stripping. Typical blade widths range from 1.5 to 2.13 m (5 to 7 feet).

Archaeologists should monitor the removal of the overburden and face or scrape the horizontal surface with hand tools and leaf blowers to define the feature boundaries. The boundary of each feature should be marked, and each cultural feature should be tagged with a unique field feature number by the field director. Features should be documented as set out in the protocols below. Artifacts may be grab-sampled from the mechanical excavation spoils dirt, but no systematic collection of screened samples should be performed for mechanical stripping excavations. Large artifacts such as ground stone tools discovered during stripping should be point-located upon discovery with a hand-held GPS unit.

Hand Stripping Units (HSUs): These are a smaller-scale version of the MSU and are excavated with hand tools. HSUs are used to expose features in circumstances where mechanical excavations may prove too destructive to the archaeological features (e.g., where the encounter of human remains is considered probable, where the overburden deposits are thin, and where the underlying cultural features are delicate). Sediments removed during the excavation of HSUs are typically not screened, although a grab sample of artifacts may be collected. The excavation of HSUs should be task appropriate, and their sizes and shapes may be irregular.

Feature Recording

Strict control of the numbers and types of features discovered is vital to ensuring that sampling and excavation strategies are correctly executed. As cultural features are discovered during surface reconnaissance and excavation, each feature should be assigned a unique identifying field feature number from a master log maintained by the field director. The number should be written on a semi-permanent tag anchored to the feature. The boundary of each feature should be defined and marked, and its location should be mapped. Basic information should be recorded for each feature at the point of discovery, including feature type, estimated age, dimensions, shape, orientation, associated artifacts, evidence of heating, fill characteristics, and the feature's association with the stratum in which it originates. This information should be recorded on a master feature log maintained for each site. The purpose of this log is to keep a record of every cultural feature encountered. The field director should use the information recorded in this log for the prioritization and selection of features to be excavated. The profile of each feature discovered in the trenching should be drawn and include the feature's geological context.

Features selected for excavation should be documented using standardized forms. In addition to these forms, particular types of features (e.g., structures) may be recorded on forms tailored to collect the data and information needed for analysis. Excavators should use these forms to document their observations and to infer the nature of the feature from its creation, through its use-life, to its discontinued use and post-occupational reuse, preservation, and deterioration. Detailed plan view maps and profiles or cross-sections should be drawn for all features excavated.

Architectural Features

Architectural features are typically the most productive contexts at archaeological sites in terms of information-return on effort. First, the style of the architecture is often indicative of cultural identity and usually representative of a particular cultural era. The mental blueprint of structure design is heavily influenced by traditional cultural practices, and structure design is passed on through generations. Innovations often occur slowly. Second, these features are the constructed "activity spaces" of day-to-day living, and their interior floor spaces have been known to yield a wealth of archaeological information. Artifact assemblages from structures can provide insights into domestic economic practices and even craft specialization. Third, once vacated, architectural features are commonly used as trash repositories, and their fill often contains an abundance of day-to-day debris from ongoing activities in the immediate vicinity.

Burned structures are rich information resources because the fiery destruction of the house often preserves construction details that are not preserved otherwise. Carbonized wooden support beams and plastered walls and floors are far better preserved in burned contexts than in unburned ones. In addition, the fire often traps objects inside a structure that would have been removed under more normal abandonment circumstances. Also, burned objects would have been far less appealing to later site occupants foraging for reusable materials and were often left undisturbed. Thus, burned structures often preserve deposits that are strongly indicative of the activities that were carried out in them by their occupants. Because of their information potential, burned structures should be preferentially selected for excavation. The purpose of these excavations is to recover (1) artifacts and sediment samples from the floor of the structure (i.e., those associated with intramural household activities) and (2) the structure's architectural details. The circumstances under which the house burned is also important information. In some cases, the conflagration of the structure may have been accidental and unintentional. In others, the extent and character of the burning may indicate the post-occupational treatments practiced by the site's occupants. At some sites, nearly all of the structures were burned following the primary occupation, while at others post-habitation burning was comparatively low. In a limited way, the percentage of burned structures at a site may be as informative of cultural and social identity as the structure design itself.

Architectural Feature Excavation Strategies

Structures should be exposed in plan view through the mechanical removal of the overburden. It is often possible from these horizontal exposures to approximate the structure's size, shape, and orientation.

Excavators should establish 1-by-1-m or 1-by-2-m control units in the structures identified during testing or mechanical stripping and selected for investigation. These control units should be preferentially placed between the midpoint of the structure and its entryway if this can be determined. The purpose of these control units is to gather the information necessary to prioritize the structures in the sampling hierarchy; to collect a standardized sample of the artifact assemblage in the fill deposits; and to expose the floor in the vicinity of the hearth. Control units should be excavated from the uppermost identifiable cultural fill to the floor surface. The fill deposits should be removed in natural stratigraphic units or arbitrary 20-cm levels if natural units are not discernable. All sediments should be sifted through a ¼-inch sieve for artifact and specimen recovery. All artifacts captured by the screen should be collected regardless of their actual size. Sediment samples should be collected from the levels for macrobotanical analysis when there is evidence of charred plant materials. Additional sediments should be collected specifically from the floor contact for palynological studies. The purpose of the control samples should be to obtain the information necessary to place each structure into a sampling hierarchy based on apparent chronological age, architectural style, function, and potential to recover informative assemblages of artifacts, specimens, and samples. Artifacts from the control unit provide a quantifiable sample for calculating artifact density within a structure, which allows for comparisons between structures. The field director should determine on a case-by-case basis whether a larger volume of fill is needed to obtain a meaningful sample of the artifact assemblage, to gather the necessary information to place the structure in the sampling hierarchy, and to expose the hearth.

The fill deposits in the structures should be characterized as one of four primary depositional units: (1) post-collapse trash and sediment accumulations (fill); (2) post-collapse trash and accumulations in close proximity to the floor (near-floor fill); (3) structural debris above the house floor (roof and wall fall); and (4) the floor itself (floor). The fill layer contains trash accumulations that reflect activities after the structure was vacated or the natural processes of erosion and deposition at the site. The near-floor fill layer contains the artifacts and other materials that were deposited in the house immediately after it was vacated. The structural debris layer caps the artifacts that were in the house at the time it was vacated or at the time the superstructure collapsed. Depending on the nature of the discontinuation of use, the artifacts within and below the structural debris may reflect the household assemblage at the time the structure was vacated or consist of post-abandonment refuse that accumulated in a standing, vacated structure before it collapsed.

The information obtained from the control units should be used to assign the structures to one of three categories: (1) burned, (2) unburned and trash-filled, and (3) unburned and not trash-filled. This information—along with the structure's size, shape, and location within the settlement—should be used to select the sample of structures for complete excavation. Whether selected for complete excavation or partial excavation, the fill should be excavated following the excavation protocols defined here. The portion of the structure outside the control unit should be partitioned into halves, thirds, quarters, or some other portion for excavation. For each portion, fill deposits should be removed *en masse* to the top of the structural debris or to within 10 cm of the floor. This upper structure fill should not be screened since a quantitative sample of this trash should have already been collected by level during the excavation of the control unit, but a grab sample may be made to recover chronologically diagnostic artifacts. The systematic collection of material from the upper fill should be conducted if a systematic sample has not already been collected (e.g., in situations where a control unit was not excavated).

If any post-occupational features are identified that are intrusive into the structural deposits, these features should be investigated as any other extramural feature. The fill and artifacts of the intrusive features should be carefully separated from the structural fill. Such features should be included on the overall maps of the structure. Every effort should be made to identify the chronological sequence if multiple features are intrusive into one another.

All fill within 10 cm of the floor (the near-floor fill) and all the structural debris (roof and wall fall) should be sifted through a ¼-inch sieve to recover artifacts and specimens. Sediment samples for flotation analysis and macrobotanical specimens should be collected from the structural debris and near-floor fill layers in burned houses to gather information about architectural wood and economic plant use. Every effort should be made to leave items that represent household assemblages or structural elements in contact with the floor in place until the entire floor can be exposed and recorded. The floor level of the structure should be recorded in detail, including the locations of the artifacts and other materials in contact with the floor, the locations of the floor features, and the character of the floor itself.

Sediment samples should be collected for palynological studies from any locations believed to be sealed primary contexts from the time the structure was originally occupied such as beneath objects resting on the floor surface of the structure, from the fill of the hearth (if present), from the floor surface surrounding the hearth (if present), and from other informative contexts based on the field director's judgment. Pollen may be introduced into archaeological contexts through a number of processes, including anthropogenic, animal, water, and wind (Bohrer 1981). Areas with excessive rodent disturbance may yield pollen transported via animals, whereas the pollen collected from structure floors covered with aeolian deposits may be contaminated with post-occupational pollen. In stratified deposits, excavators are encouraged to take palynological samples from each natural stratum for a comparison of the natural background pollen with the primary cultural context on the structure floor. Archaeomagnetic samples should be collected from oxidized hearths, floors, and pit plaster when plaster preservation is adequate to warrant it.

Intramural floor features should be excavated, and their fill should be sifted through a ¼-inch sieve for artifact and specimen recovery. Larger floor pits may be bisected and drawn in profile if the pit fill is composed of stratified layers. Sediment samples for the recovery of charred botanical materials should be collected from the hearth and other thermal features in the structure. Palynological samples may be recovered from the bases of intramural pits filled with cultural deposits.

All structures should be photographed prior to excavation and after each unit is excavated to the floor surface. Photos should be taken once a structure has been completely excavated, and every effort should be made to leave artifacts in contact with the floor in place for the final structure photos. Delicate artifacts may be removed and their locations marked on the floor after having been mapped in place. Tools should not be left exposed on floor surfaces overnight or on weekends. Delicate artifacts may be put back in their original positions for final post-excavation photos. Excavators should prepare drawn-to-scale plan view and cross-section maps of each structure depicting any intrusive or intruded upon features, floor artifacts, intramural features, the extent of wall and floor preparation or oxidation, and any other items of note.

Extramural Feature Excavations

Extramural features typically consist of thermal pits, non-thermal pits, and extramural hearths. After the initial discovery and documentation of an extramural feature, the excavator should photograph the feature prior to excavation. They should then bisect the feature into two roughly equal sections and excavate one half in stratigraphic or natural levels, if possible. All fill should be screened through ¼-inch mesh, and all artifacts and specimens should be collected from the screen. Four-liter sediment samples should be collected from those thermal extramural features that contain abundant visible charcoal, ash, or other deposits appropriate for macrobotanical analysis. Smaller sediment samples should be collected, where possible, from undisturbed contexts within the feature for palynological or phytolith analysis. The contexts preferentially targeted for palynological samples should be the lowermost fill and the bottom surface of the feature. Feature excavation should be thoroughly documented on standardized recording forms. Scaled plan view and profile or cross-section drawings should be completed for all excavated features. Features should be photographed at the completion of the excavation. The remaining portion of the feature should be excavated at the discretion of the field director based on an evaluation of the feature's potential information-return. Unusual or rare deposits such as caches should be completely excavated, and all artifacts collected. Extramural features that are not formally excavated should be probed or excavated without screening or documentation to ensure that no human remains are present.

Miscellaneous Features

Other feature types that may be encountered include extramural structures such as ramadas, trash mounds or middens, and use-surfaces. These features—and any feature type not outlined in the previous sections—should be investigated in a systematic fashion that includes plan and profile mapping, photography, and excavation through control units or as a whole feature. Excavation techniques should be consistent with those previously described, as should the methods used for feature recording. The approach for extramural structures and use-surfaces would be most similar to the methodology used for architectural features, with the excavation of a control unit followed by the exposure of the floor or use-surface. Additional excavation may be conducted at the discretion of the field director in consultation with the COP Archaeologist. Middens or trash mound features may be sampled by the hand-excavation of a 2-by-2-m control unit. Additional units may be hand-excavated at the discretion of the field director if it appears that the midden deposit has distinct depositional aspects that cannot be sampled in a single unit. Units may also be strategically placed in an effort to define the boundaries of such features.

Canal Investigation Methods

Canal alignments may be identified during cultural resource investigations within sites. Several methods of investigation may be applied if such features are encountered to provide information on overall canal patterning as well as on the operation and maintenance of the individual channels. A geomorphologist should play a prominent role in documenting and analyzing canal features.

If a canal alignment is found within a systematic trench, judgmental trenching may be conducted in addition to the systematic trenching proposed in the project-specific addendum. Attempts should be made to trace the routes of all identified canals using trenches excavated along the projected path of the canal(s) within the site (or project) boundary. These judgmental trenches should be placed perpendicular to the canal alignment, if possible. Alternatively, archaeologists have had good results in recent years stripping away the overburden using large excavators equipped with special stripping buckets and following the canals. This technique can result in the identification of canal junctions and structures such as water-control dams. Additional information to be gained from the multiple canal exposures includes data on the gradient of the canal, the canal's associated flow rate, and changes in the canal's structure along its path.

Individual profiles should be drawn of all canal features found. Selected canals may be analyzed by taking soil samples in a vertical column pattern from strata throughout the canal or from 10-cm intervals in canals with homogeneous fill. The samples may be subjected to flotation, pollen, or particle size analysis, which may yield information on canal use, filling episodes, and chronology. Samples may also be collected for the analysis of ostracodes to infer water chemistry, the water source, and paleohydraulics. The project geomorphologist should oversee the sampling of canal features.

Any features related to canal use, including headgates, junctions, berms (embankments), and dams, that are located in the project area should be intensively investigated through excavation and sampling similar to that employed for other feature types. As noted previously, mechanical stripping should be used to expose portions of canals and canal features such as junctions and fields in plan view. If suitable contexts are found within canal sediments, radiocarbon and OSL samples may be collected and analyzed for chronological data. Stratigraphic association may also be used for dating. All canal profiles should be examined for evidence of floods and for evidence that might help date those flooding episodes.

Sample Collection

Modern archaeological investigation is a multidisciplinary field, one in which professionals with backgrounds in geology, geomorphology, paleoethnobotany, paleoecology, zoology, paleomagnetism, and dendrochronological studies contribute to the interpretation of the archaeological record. To that end, many types of samples should be collected to make the interpretation of the whole more thorough and accurate. Specialized studies may include chronometry, subsistence, paleoenvironment, and resource procurement and processing.

Chronometric Samples

Of primary importance in the interpretation of a site is a robust understanding of its occupational chronology.

The best radiocarbon dating results are achieved through Accelerator Mass Spectrometry analysis of annual plant materials associated with human activity, particularly subsistence (Smiley 1998a, 1998b). Archaeologists should collect samples of identifiable annual plant species for radiocarbon analysis. Maize kernels found in storage pits and hearths, matting, baskets, and other textiles made of annual grasses found in association with a structure floor or storage pit should be given the highest priority for radiocarbon sampling. Often, radiocarbon samples can be recovered from flotation samples and other sediment samples collected to study Native American plant use.

TL dating is based on the measurement of radiation accumulated within minerals since the last time the minerals were heated to a sufficient temperature to release that radiation. The crystalline structures of minerals absorb minute quantities of radiation from the environment over time. Crystals in the temper of ceramic artifacts (quartz, for example) also accumulate this radiation from radioactive impurities in the clay (Aitken 1990). Heating the artifact to a sufficient temperature (i.e., 300 to 400ºCelsius [572 to 752ºF]) (Aitken 1990) releases this radioactive energy, which has been stored as electrons (Daniels et al. 1953), thus resetting the "thermoluminescent clock." The prehistoric firing of a ceramic vessel or the burning of a stone artifact in a fire would have reset the TL clock. Observations of the amount of energy that *ought* to be stored in an artifact with the amount *actually* stored can be used to calculate the number of years since the artifact was last heated. TL dating is independent of other chronometric dating techniques, meaning that TL samples do not suffer from the "old wood problem" of radiocarbon samples (Schiffer 1982, 1986), the dependence on a known record of geomagnetic secular variation for interpreting the results of archaeomagnetic samples (Eighmy 1980), or the reliance on a comparative record of tree rings for a region as dendrochronological samples (Ahlstrom and Smiley 1998). TL is not widely applied in the Hohokam culture area, but archaeologists may consider TL dating to resolve chronometric gaps in instances where other dating techniques are insufficient. TL dates derived from sherds recovered from canal sediments have proven excellent markers of canal dates (Watkins et al. 2011).

OSL dating is based on some of the same principles as TL dating. Electrons trapped within the crystalline structure of minerals are sensitive to sunlight, and exposure to sunlight causes them to be released (Kelly and Thomas 2011). Sediments buried by subsequent deposits begin to accumulate these electrons within their crystalline structure, storing them until exposed to sunlight again (Yukihara and McKeever 2011). The electrons can be released by exposing them to certain light frequencies, and analysts can measure the light energy emitted when the electrons are released. Using that information, they can calculate the age of an OSL sample. This age records the time since the samples were last exposed to sunlight. The OSL technique is best conducted on aeolian sediments, which were presumably exposed to more sunlight than fluvial sediments just prior to deposition and have therefore had their OSL electron balance completely reset (Kelly and Thomas 2011). Samples must be collected in darkness so as not to expose the sediments to sunlight. Archaeologists may collect OSL samples from buried deposits in order to date the strata in which they originate. Research has shown that OSL holds great potential for dating canals (Watkins et al. 2011), particularly the single-grain aliquot method (as opposed to the multi-aliquot approach) (Huckleberry and Rittenour 2014). Good results were obtained with OSL dating at the Tempe Historic Townsite (Fertelmes and Hackbarth 2022; Hackbarth 2022). Researchers should consider using OSL and TL dating methods, especially for the dating of prehistoric canals.

Archaeobotanical Samples

Archaeobotanical samples can reveal a great deal about the economic uses of plants in day-to-day subsistence and household economic pursuits as well as the paleoenvironmental conditions at the time of site occupation. Archaeologists should collect charred macrobotanical specimens and sediment samples for archaeobotanical analysis from the near-floor fill strata of burned structures and from thermal pits filled with in situ burned materials. Excavators should collect appropriately sized samples that can then be subjected to flotation processing to recover charred archaeobotanical materials. Sample sizes will be determined at the guidance of the archaeobotanical analysts. Samples from burned structural debris should be given priority as samples from this context are the best for addressing research questions about economic and subsistence plant use within households.

In addition to the economic uses of plants in day-to-day subsistence, palynological analyses can also provide information on the overall types of plant species present at an archaeological site. Comparisons of the pollen found on structure floors and in food-preparation features with paleoethnobotanical records of the general plant species available at the time of occupation can be used to infer economic plant use, subsistence strategies, and even the time of year a feature was occupied (Bryant and Holloway 1983). Sediment samples should be collected for palynological studies from sealed contexts beneath objects found in place on structure floors, from the fill of intramural hearths, from floor surfaces surrounding intramural hearths, and from other informative contexts based on the field director’s judgment. Ideally, palynological samples should be collected from any location believed to be a sealed primary context from the time the structure was originally occupied. Pollen samples should be collected from exposed sediments quickly, as exposure to hot and dry conditions can destroy fragile pollen in a relatively short period of time (Van Zinderen Bakker 1995).

Phytoliths are microscopic remnants of decomposed plant matter (Dunn 1983) formed when plants draw in silica from groundwater as monocilicic acid (Pearsall 1982). The silica fills the plant cells and solidifies, making a durable cast of the plant cells that endures long after the plant has decayed or burned. Phytoliths are typically better preserved than other types of macrobotanical remains and thus can fill important gaps in the archaeobotanical record (Dunn 1983). Sediment samples for phytolith analysis should only be collected from controlled contexts such as structure floors, hearths, and pit bases. Every effort should be made to reduce contaminants within the samples. All tools used to collect these samples should be cleaned before collection. Analysts may examine the sediment samples collected for palynological analysis for phytolith remnants due to the similar conditions required to collect and process both these samples.

Samples from Canals

Sediment samples may be collected from canals for a variety of studies. Analyses of the size, shape, and sorting of deposits within a canal can be used to infer streamflow. In addition, the presence or absence of microscopic ostracodes and gastropods (snails) can serve as a proxy for the condition of the water system. When used together, analyses of these types of samples can help archaeologists and geomorphologists reconstruct the flow, stability, and chemical conditions of a water feature.

The flow regime of a water system, be it a river or a canal, subsumes the magnitude, frequency, duration, timing, and rate of change of the flow (Poff et al. 1997). Granulometric data—the size and superpositioning of channel deposits—can be used to interpret the flow regime of a water system (Ackerly et al. 1987; Huckleberry 1999). Coarse-grained strata represent episodes of fast-moving, high-volume stream flow. Repetitive strata of well-sorted sediments with coarse grains covered by increasingly finer grains represent the regular discharge of water from a headgate (Huckleberry 1999). Irregular, poorly sorted deposits indicate uncontrolled flooding (Masse 1988). Sediment samples should be collected from discrete strata within canal features to infer streamflow conditions and to compare them with known flow conditions from other Hohokam and historical canal systems within the watershed of the Salt River. Sediment samples should be sorted by grain size, and the relative proportions of sand and clay should be determined in order to reconstruct the flow regime and help identify episodes of flooding (Huckleberry 2015). Sediment samples collected from canal deposits can supplement field descriptions of canal deposits and help standardize the descriptions.

Freshwater ostracodes and gastropods are excellent indicators of the paleoecology of perennial and ephemeral water systems (Bayman et al. 1997; Bayman et al. 2004). Different species of ostracodes favor certain conditions of salinity, temperature, moisture, water hardness, and pH (Cohen and Nielsen 1986; Murrell and Shelley 2009). The presence or absence of different species can reveal a great deal about the availability, seasonality, and chemical composition of the water in prehistoric canals and water-storage features. Archaeologists may collect sediment samples from canals and presumed water-storage features in order to reconstruct the paleoenvironment of the project vicinity. Sediment samples should be collected from documented, identifiable strata within water-control or water-storage features. Clean tools should be used to collect the samples to avoid contamination. The location of each sample should be noted on scaled profile drawings.

Post-data Recovery Monitoring and Encounters

Post-data recovery monitoring may be recommended, especially for projects where human remains were encountered. The *General Monitoring and Discovery Plan for the City of Phoenix, Maricopa County, Arizona* (Henderson 2020 or the most recently updated version) provides guidelines for monitoring when required.

HUMAN REMAINS TREATMENT

A BDA must be requested prior to beginning fieldwork for work within prehistoric site boundaries. This BDA will be the guiding document for the treatment of human remains, funerary objects, and, in some cases, sacred ceremonial objects and objects of national or Tribal patrimony.

Human remains may be encountered in a mortuary feature or in an isolated context. Human remains must be 100 percent recovered and shall take the highest priority for recovery once identified and once the applicable protocols/notifications have been implemented. This will limit and minimize the risk of post-identification disturbance of human remains.

The BDA will contain instructions for the respectful treatment and repatriation of human remains and funerary objects, with sections describing the following:

- Initial notifications and procedures,
- Notifications following the disturbance of remains,
- Security of remains,
- Procedures for the respectful treatment and repatriation of remains,
- Prohibited activities,
- Requirements regarding faunal collections, and
- Reporting requirements.

Animal Mortuary Features

Animal mortuary features may be encountered during excavation, and the treatment of specific types of animal mortuary features may be described in the project's BDA. Animal mortuary features are defined as the intentional interments of animal remains and are distinct from animal remains that may represent subsistence activities. Examples of these are the intentional burials of canines and raptors. Animal mortuary features should be treated with respect and dignity and in accordance with the wishes of the Tribe claiming affinity for human remains and funerary objects. The animal mortuary features should be recovered following the same protocols used for human mortuary features.

Sacred Ceremonial Objects and Objects of National or Tribal Patrimony

Some BDAs will include provisions for the identification, care, and treatment of sacred ceremonial objects and objects of national or Tribal patrimony. These classifications of objects are defined in A.R.S. § 41-844.

Sacred ceremonial objects refers to cultural items traditionally used in religious observances. *Objects of national or Tribal patrimony* means inalienable items of historical or cultural significance to Tribal groups. These objects shall be treated with respect and as specified in the BDA.

Mortuary Feature Field Procedures

A good faith effort will be made to locate and identify all human remains and to recover those remains in accordance with the terms of the BDA obtained from the ASM. At all times, archaeological contractors and their representatives will treat human remains and funerary objects with care, respect, and dignity. All human remains, funerary objects, sacred ceremonial objects, and objects of national or Tribal patrimony will be treated according to the stipulations, requirements, and limitations set out in the BDA. Upon disturbance, human remains and funerary objects will be secured and protected in place until recovery can commence. Protection will include measures to ensure that no damage, vandalism, or desecration occurs. Protection will also include measures to prevent the unauthorized viewing of the remains, including covering the remains with unbleached cotton muslin and dirt and barricading the area around the remains, particularly overnight. Security (e.g., fencing, screening, a security guard, etc.) will be provided for any remains left in situ overnight, as appropriate for the situation. Remains will only be viewed by essential project personnel. Archaeological contractors and their representatives will avoid unnecessary disturbance, handling, or escorting of human remains and funerary objects. Photography of human remains and funerary objects is prohibited. If photographs are taken of features or artifacts later found to be from a mortuary context, they must be deleted from all media devices. The COP's media policy for disturbance to ancestral human remains is provided in **Appendix B**. Sample collection and destructive analysis will also be prohibited. The handling of human remains and funerary objects must be kept to a minimum. Individuals will not be separated from their funerary objects at any point during recovery, escorting, housing, or documentation.

Recovery will be conducted by a qualified archaeologist, bioarchaeologist, or osteologist. An ASM Human Remains Documentation Packet, or equivalent paperwork, should be initiated in the field and completed in a secure facility to ensure the accuracy of the documentation details. A drawing will be made before and during recovery. This drawing will include, at a minimum, details showing the position and orientation of the remains and the locations of all funerary objects. All funerary objects will be inventoried and documented. Documentation may include sketches or illustrations of funerary objects. When practicable, all feature fill will be gathered or screened through ⅛-inch mesh. Cremated remains will be recovered within the sedimentary matrix in which they were deposited and not screened. The surrounding sediment will be screened through ⅛-inch mesh. Fill from vessels will not be removed. Unless otherwise requested by the designated lead claimant and the ASM Repatriation Office, human remains and funerary objects will be escorted to a secure facility for temporary housing and documentation by a qualified osteologist prior to repatriation to the appropriate claimant groups in a timely, respectful, and efficient manner.

Whenever human remains are encountered, controlled stripping must be undertaken for a radius of 10 m from the individual (in all directions) and at a depth below the individual and below the cultural resources horizon (e.g., to culturally sterile soil) **or to a depth approved by the CAO**. The purpose is to determine if additional human remains are present because mortuary features often occur together in cemeteries, particularly at Hohokam sites. At habitation sites that have been occupied prehistorically for generations, the expectation is to probe all pit features, test plaza areas, and strip below all architectural features to determine if mortuary features are present.

Post-recovery Osteological Documentation

Osteological documentation and documentation of mortuary practices can provide information on prehistoric social organization, worldview, and ceremonialism, and a person's mortuary treatment can reflect his or her personal and social roles within a community (Mitchell and Brunson-Hadley 2001:47). Documentation of human remains can aid in addressing questions of diet and health, mortality, and other physical characteristics of the population. These topics, along with population size, are aspects of demography, and many questions related to demography can be addressed through osteological documentation.

A full assessment of each individual should be conducted, although the amount and kind of documentation may vary depending on the type and condition of the interment. Human remains and funerary objects will not be washed. If necessary for documentation, human remains and funerary objects may be dry-brushed. Any sediment removed during dry-brushing must be gathered and repatriated with the remains. Documentation categories include an element inventory, metrics and stature estimation, age-at-death estimation, sex estimation, cranial deformation, non-metrics, paleopathology, taphonomy, dentition, and burning pattern (when applicable). Some documentation such as metrics, stature estimation, and cranial deformation cannot be observed for typical cremations. Documentation specific to cremations includes total weight, degree and pattern of burning, and warping. As much information as possible should be documented in the field. Recorded information should be in accordance with *Standards for Data Collection from Human Skeletal Remains* (Buikstra and Ubelaker 1994) or the equivalent.

Dental information can pertain to age at death, diet, health, disease, and genetic affiliation (Kelley and Larsen 1991). Osteologists should record ante- and postmortem loss of teeth, anomalies in teeth or osseous remains, and dental pathologies where applicable.

LABORATORY PROCEDURES

Laboratory and collections management procedures should follow standard professional practices and adhere to relevant guidelines, including the *Pueblo Grande Museum Archaeological Repository Guidelines* (COP 2020b or most recent update to these guidelines) and the BDA. Unless otherwise required by law, all materials from projects conducted under this HPTP will be curated at the S'eḏav Va'aki Museum.

A repository agreement between the S'eḏav Va'aki Museum and the consulting archaeologist stipulating that the S'eḏav Va'aki Museum will provide repository services must be obtained prior to each project. It is the responsibility of the consulting archaeologist to obtain the most recent guidance for curation, for city archaeology, and all other applicable guidelines. Copies of the most recent versions of the CAO guidelines for archaeology, the S'eḏav Va'aki Museum repository manual, and the ASM repository manual will be kept in the laboratory per COP guidelines.

The combined functions of the laboratory should include:

- Providing logistical support for the field and maintaining equipment and supplies;
- Assigning blocks of specimen numbers to field crews;
- Verifying the accuracy of field and specimen information;
- Maintaining inventory control of collected materials, including tracking their status and location during all stages of the project;
- Overseeing the project database;
- Processing artifacts and samples in preparation for analysis, cleaning, packaging, labeling, and data entry;
- Coordinating stabilization/conservation treatments for fragile artifacts;
- Conducting preliminary analyses/artifact sorts;
- Coordinating and facilitating artifact transfers to outside analysts;
- Organizing the collections and documentation and providing secure and appropriate temporary storage; and
- Preparing collections for permanent curation.

The laboratory facility should contain a sink, shelves for artifact storage, worktables, a computer for data entry, associated lab supplies and equipment, and a secure area for human remains, funerary objects, sacred ceremonial objects, and objects of national or Tribal patrimony.

Field specimen logs and provenience information recorded on bags will be checked by laboratory personnel. Once the samples and artifacts have been checked in at the laboratory and inventoried, they will be organized for analysis. Artifacts sent to subconsultants will be accompanied by a standard *Collections Release Form*, which authorizes the analysis and identifies the specific material delivered and received. At the completion of analysis, all remaining materials will be catalogued for curation following S’e̠dav Va’aki Museum guidelines and will be submitted to the S’e̠dav Va’aki Museum along with the relevant documentation.

Special Considerations

Some BDAs now include provisions for the care and treatment of sacred ceremonial objects and objects of national or Tribal patrimony. Please ensure that there are procedures in place to provide appropriate care for these special classes of cultural items as specified in the BDA.

Analytical Methods

Analytical studies should be conducted on the artifacts, specimens, and samples collected during the field explorations to obtain the data necessary to address the research themes presented in this document.

Native American Ceramic Studies

Ceramic artifacts include both pottery containers and other, more esoteric objects such as beads and figurines. Ceramics, more than any other medium available to the Native American artisans, were malleable to the whims of the artisan and can express the modes and mores of the artisan’s historic context. Standards for the analysis of ceramics can be derived from Abbott et al. (2012), Haury (1937, 1945, 1976), and Wallace (2001, 2004), among others (Abbott 1988; Abbott and Gregory 1988; Antieau 1981; Crown 1981; Crown et al. 1988; Doyel and Elson 1985; Howard 1989; Large et al. 1994; Motsinger 1993; Weed 1972; Whittlesey et al. 1998). The pottery recovered has the potential to provide information about every research topic presented. Pottery styles, forms, and technology are indicative of different cultural traditions. For example, the assumption of Hohokam and Patayan co-residence at village sites such as AZ T:12:10(ASM) is based on the identification of two technologically distinct buff wares: the Hohokam Middle Gila Buff Wares and the Lower Colorado Buff Wares. The Patayan pottery from the Ak Chin Reservation exhibits technological and formal characteristics that suggest that the potters were fundamentally Patayan in technological tradition but Hohokam in their formal styles (Deaver 1990). Similarly, the documentary record of changes in pottery decoration, form, and technology provides the underpinning of the Hohokam cultural chronology and the sequence of phases (Haury 1976; Wallace 2001, 2004). Lastly, the recent reinterpretation of Hohokam economic and interaction networks was derived from detailed studies of Hohokam pottery (see Abbott 2000, 2001, 2009).

The ceramic artifacts recovered may be from both mortuary and non-mortuary contexts. Ceramic artifacts from mortuary contexts should be inventoried and treated in accordance with the terms of the BDA. No destructive analysis of any mortuary vessels shall be conducted. This includes "snipping" the edges of sherds to observe the paste characteristics. Pottery type, artifact form, vessel form, and temper type, if visible from a natural break or on the surface of the artifact, should be recorded for mortuary vessels. Designs and vessel forms should be accurately rendered by hand drawings. Ceramics from non-mortuary contexts should be subjected to two levels of analysis: (1) general and (2) detailed. The objective of the first level (general) is to inventory and assess the entire collection. Once this analysis is completed, a sample of the collection should be subjected to a second, detailed analysis. The specific types of analyses are not fully defined here because they are dependent on the characteristics of the overall ceramic assemblage. Examples might include the technological comparison of painted and plain ware ceramics, examination of chronological trends in vessel morphology, and investigation into the manufacture provenance of painted pottery (Deaver and Hider 2017).

During the initial inventory and assessment, ceramics should first be separated into pottery and non-pottery categories. Non-pottery artifacts should be assigned to categories based on the qualities of manufacture, decoration, and inferred function (e.g., figurine and bead). Pottery artifacts should initially be sorted into generic categories that provide a structural foundation for future analyses. All pottery artifacts should be sorted and tabulated into categories defined by the generic ceramic ware (e.g., painted, red, and plain) and artifact form (e.g., rim, neck, shoulder, handle, body, and vessel [whole or incomplete]). Any sherds or vessels that show evidence of post-firing modifications to refurbish the artifact, remodel it for a secondary use as a vessel, or transform it into another artifact form such as a spindle whorl or pendant should be identified and segregated for more specialized analysis. No further classification or analysis needs to be done on pottery sherds less than 5 cm^2 except in specific cases where clear diagnostic qualities are present or the sherd has been remodeled or reused. The larger painted and red ware pottery artifacts should be classified according to prevailing taxonomic conventions (i.e., Haury 1976; Wallace 2001, 2004 for the Middle Gila Buff Ware; and other references for non-Hohokam pottery). Vessel form information should be recorded for all painted, red, and plain ware rim sherds larger than 16 cm^2 or smaller sherds that represent more than 12.5 percent of the vessel circumference. The latter stipulation ensures that small and miniature vessels are included in the study. Vessel form information should include classification into formal categories defined by prevailing taxonomic conventions and the recording of metrical data where possible.

Detailed studies of design and vessel form may be carried out on specific subsets of the assemblage. These analyses should be dependent on the nature of the collection and the presence, preservation, and frequency of key attributes. Sherds and vessels with evidence of post-firing remodeling or reuse should be segregated during the initial inventory and analyzed further. This category should include vessels that have been refurbished to continue functioning in their original use; vessels that have been remodeled to transform them into a secondary vessel such as a portion of a jar remodeled into a bowl, platter, or scoop; and vessels that have been recycled into a new artifact type such as a spindle whorl or pendant. Attributes relating to each of these uses should be recorded in addition to those that represent the original intended use of the vessel.

A sample of the pottery assemblages may be selected for detailed petrographic and chemical analyses to ascertain where the pottery was manufactured and to determine details about the ceramic technology. These data can be used to map the network of pottery manufacture and exchange and, in combination with other data sets, provide a geographic map of the economic and social networks in which peoples participated. Whether or not chemical studies of the ceramic paste and temper constituents should be conducted—and by what methods—should be determined once the character of the ceramic assemblage has been assessed.

The same methods and standards will be employed in the analysis of potentially Historic period Native American ceramics.

Flaked Stone Artifacts

Flaked stone analyses should be designed to help address the research questions posed in the research design. Whereas data from the flaked stone analysis should prove essential for addressing many research issues, the most robust interpretations should result from interpreting the data gleaned from the flaked stone analysis in conjunction with other lines of evidence.

The relationship between settlement patterns and the organization of flaked stone technology has been well studied (e.g., Bamforth 1991; Binford 1979; Carr 1994; Shott 1986). Mobile populations are expected to invest in a formal, reliable, and portable toolkit, while sedentary populations are expected to use expedient or informal technologies with little effort expended in tool manufacture (Andrefsky 1994; Kelly 1988; Nelson 1991; Parry and Kelly 1987). The lithic technological organization of sedentary Hohokam agriculturalists conforms to these expectations. Hohokam flaked stone assemblages tend to be similar over time and space, consisting of expediently manufactured tools made from locally available raw materials produced using hard-hammer core reduction. Little effort was invested in tool manufacture, which was geared toward satisfying immediate onsite tool needs. With the exception of projectile points, flaked stone tools tend not to be functionally or chronologically diagnostic, with many tools functioning for multiple purposes.

The Hohokam flaked stone assemblages at the sites in the Phoenix area are expected to be generally similar to those described above. Despite this redundancy in Hohokam flaked stone assemblages, flaked stone studies are still integral to addressing many prehistoric research themes. Additionally, Historic period Native American research themes can also be addressed using data from flaked stone assemblages.

To provide the data necessary to address the research questions posed in the research design, flaked stone artifacts recovered during data recovery should be subjected to a detailed attribute analysis. The first step in this analysis should be segregating the assemblage into tools and debitage. Tools are defined as pieces of lithic material that have been modified through purposeful retouch or use. Debitage is defined as unretouched pieces of lithic waste material struck from some parent material.

All tools identified in the assemblage should be analyzed. The focus of the tool analysis should be functional interpretation, whereas the focus of the debitage analysis should be to characterize reduction and tool-production strategies.

Analysis should include the identification and recording of each tool's morphological and size attributes, raw material type, and typological attributes. For debitage, depending on the amount recovered, a minimum 10 percent sample should be analyzed. Larger sample sizes may be chosen at the discretion of the analyst to ensure that the analyzed samples are representative of the debitage as a whole. Recorded debitage attributes should include raw material type, weight, cortical retention, platform type, and other platform attributes. The debitage analysis can inform on the organization of the flaked stone technology at the sites in the Phoenix area and research themes related to mobility, settlement structure, and organization.

Tool analysis should be able to provide information relevant to numerous research themes. For example, interpretations of tool function can be used to address issues related to subsistence and non-subsistence economies. To identify tool function, specific attention should be paid to certain aspects of tool morphology such as the angle of the working edge and any evidence of macroscopically visible use-wear. These can be used to identify the types of tasks the tool was used for. Tool and debitage analysis should also provide insight into the household economy, helping to identify craft specialization, if present. Tools identified at quarry sites can help archaeologists to better understand the technological organization of the groups who used the sites as well as identify whether "gearing up" (Binford 1978) or more gradual tool replacement strategies were being employed.

Any identified projectile points should undergo a detailed typological assessment and should be typed through comparisons with published examples in the regional literature (e.g., Loendorf and Rice 2004; Sliva 1997). Projectile point analysis may be particularly beneficial in addressing the issues of subsistence, chronology, and cultural affiliation as well as the relationship between Prehistoric and Historic period populations (see Loendorf 2012). Projectile points may also provide information about the household economy and regional interaction and exchange networks if craft specialization is identified.

Protohistoric and Historic period Native American flaked stone assemblages lacking projectile points are often difficult to identify, but attention to technological organization and the identification of reworked prehistoric flaked stone may help identify these components.

The identification of raw material types should be one focus of the flaked stone analysis, with particular attention paid to identifying sources from outside the Salt River Valley. Obsidian artifacts identified in the flaked stone assemblage should be subjected to X-ray fluorescence analysis for toolstone-source identification in order to provide information relevant to local and regional socioeconomic interaction and exchange networks as well as changes in those interaction patterns and exchange networks over time. Obsidian source analyses can also inform on the relationship between Prehistoric and Historic period populations. Loendorf (2012; Loendorf et al. 2013), for instance, argues that trends in obsidian acquisition patterns over time provide evidence of cultural continuity in the middle Gila River Valley.

Ground and Carved Stone Artifacts

Ground and carved stone artifacts include milling implements, hafted percussion tools, jewelry, containers, palettes, and sundry other items shaped from stone by pecking, grinding, or carving. The standards to be used in the analysis of ground stone should follow those developed by Jenny Adams (1989, 1996, 1999, 2002, 2014). Hohokam ground stone assemblages from the Phoenix Basin are diverse (e.g., Haury 1976) and can provide data relevant to the theme of Hohokam Economy and Interaction. Analysis of utilitarian ground stone such as manos and metates should focus on tool use, grinding technology, and subsistence practices as well as milling implement form (e.g., trough, basin, slab, and mortar) and degree of formal shaping. This should enable us to better understand the subsistence base and occupational strategies of the prehistoric groups who inhabited the settlements in the region (Adams 2014:51–57). The compositional analysis of the milling stones—specifically, formal, shaped vesicular basalt manos and metates—can also provide information on Hohokam regional interaction and trade (Fertelmes 2014). To better understand Hohokam raw material provisioning practices and trade, archaeologists may test a sample of the vesicular basalt milling stones from the project using a portable X-ray fluorescence spectrometer and compare these results to the raw material sources described by Fertelmes (2014). Parameters like grinding intensity, wear management, and secondary reuse can also provide insights into raw material provisioning practices and, by extension, household economy and regional interaction. Similarly, any turquoise specimens recovered may be analyzed to ascertain their probable origin. The provisioning, production, and exchange of ground and carved stone items should add another dimension to the study of Hohokam economic systems and interaction.

Utilitarian ground stone items not related to the milling of foodstuffs (e.g., abraders, awls, and pottery anvils) can also contribute to our understanding of Hohokam stone working and exchange. Non-utilitarian and rare ground stone items such as containers (censers and bowls), palettes, and other esoteric, shaped items can inform on prehistoric ritual activities. The study of non-utilitarian items should concentrate on comparisons of discovery contexts as well as comparisons with similar items found at previously excavated sites.

The analytical sample should consist of all ground stone artifacts that can be attributed to formal categories and rare or unique items. Broken, non-diagnostic ground stone artifacts can be tabulated in the field by material type, and only a representative sample of the lithic raw material types should be collected. Non-metric attributes recorded for each ground stone item should include, at a minimum, artifact type (e.g., mano, metate, and palette), subtype (trough, slab, basin, and plain vs. decorated palettes), plan view shape, raw material type, texture, condition, presence of burning, presence of pigment, manufacturing or design technique (expedient vs. strategic), use-type (single or multiple), and number of use-surfaces. The metric attributes recorded for each ground stone item should be, at a minimum, length, width, and thickness (in centimeters).

Shell Artifacts

Possible shell artifacts include specimens of freshwater and marine shell. These artifacts may be the remnants of food items, specimens that were acquired and worked into objects of personal adornment or status emblems, or freshwater specimens recovered from aquatic contexts such as canals and reservoirs. Freshwater mollusks recovered from aquatic contexts should be analyzed separately from the shell artifacts recovered from cultural deposits. Shell artifacts from food items or personal adornment have the potential to yield important information about subsistence, ethnicity and social differentiation, exchange and commerce, and craft production and distribution. These items should be analyzed by a specialist familiar with the taxonomic identification of freshwater and marine shell as well as the variety of artifact classes typical of the Hohokam shell industry.

Shell artifacts should be identified to the most specific taxonomic level, family, genus, or species, and each item should be assigned to an established artifact category. The geographic origin of the individual items should also be determined. The analyst should evaluate these data regarding recovery contexts at the specific sites as well as in the regional context of what is known about Hohokam economics and interaction.

Shell items identified as food debris should be interpreted in the context of subsistence practices. The analysis of intentionally modified shell specimens should further explore the themes of production, distribution, and use of shell jewelry, with a specific focus on determining whether the manufacture of shell jewelry occurred at the sites in the region.

Shell objects of personal adornment are a hallmark of the Hohokam culture and can provide information on economic organization, ideology, and the social and political roles of Hohokam craft economies (Bayman 2002a, 2002b). The analysis may evaluate the distribution of shell items within the settlements in the region to determine whether households and residential units had differential access to shell items, either in quantity or in kind. Distribution should be further evaluated in terms of ethnic diversity and social differentiation and should be used to identify possible centers of manufacture. Techniques of manufacture may also be evaluated to determine if jewelry production was uniform or suggests patterns of ethnic or cultural variation.

Faunal

The analysis of faunal bone remains can provide information about subsistence practices, natural resource availability, trade networks, and site-formation processes. As such, it is an important source of data for archaeological studies. In some contexts, the animal remains may even have cultural or religious significance to Native American peoples. Because of this, archaeologists should collect and document all faunal remains in a professional and respectful manner. The ASM repatriation office requires that all collections of animal bone recovered during a project be examined for the presence of human remains. This review must be completed by analysts with sufficient training in human osteology, such as a bioarchaeologist. These specialists must conduct a visual examination of all suspected bone fragments to ensure that no human remains are mistaken for faunal bone (COP 2020b). The field director, in collaboration with osteological specialists, should examine the contexts in which the faunal remains were recovered and decide whether the remains stem from a subsistence, ritual, or other context.

Faunal remains found to originate from a subsistence or natural context should be collected and assigned artifact bag numbers. All faunal bone should be collected for analysis and curation and should be placed in plastic canisters, paper bags, or cardboard boxes as appropriate. Tissue paper or cotton wadding may be used to pad and protect fragile faunal bone elements. Faunal remains collected in the field should be carefully and appropriately packaged, handled, and cleaned prior to analysis to ensure that no damage occurs. The materials should first be “rough-sorted” and assigned to a taxon prior to more detailed study. Any signs of cultural modification should be noted. Bone and antler tools such as awls and billets should be analyzed in detail and possibly illustrated.

The number of identified specimens (NISP) and minimum number of individuals should be the units of quantification used in faunal analysis. All the faunal materials should be identified using comparative collections and conventional osteological keys (France 2009; Gilbert 1980; Gilbert et al. 1981; Glass and Thies 1997; Hillson 1990; Jones and Manning 1992; Lawrence 1951; McKusick 1986; Olsen 1968; Wheeler and Jones 1989), and the identification of mammal and avian remains and seasonal ranges should be aided through the use of field guides (Burt and Grossenheider 1976; National Geographic n.d.). The data recorded for each analyzed bone specimen should include taxon, element, side (right, left, axial, and indeterminate), condition (complete and portion), origin of fragmentation (recent, post-depositional, and pre-depositional), portion (shaft, proximal, distal, and indeterminate), epiphyses (proximal, distal, and indeterminate), count (i.e., NISP), and weight to the nearest tenth of a gram. The bones should also be examined for evidence of burning, weathering, rodent or carnivore gnawing, and cultural modifications like saw marks.

Historical Artifacts

Project-specific collection protocols for historical artifacts should be established before fieldwork begins, as projects may include in-field only analysis, limited collection, or intensive collection. In-field analysis assumes that artifacts should not be collected during a project. Limited collection may involve sampling artifacts from certain contexts such as the site surface, collection or test units, or those associated with features. To limit bias, limited collection should not entail the collection of only certain material classes or diagnostics. Intensive collection refers to a relatively more comprehensive site collection from varied contexts, including the site surface and excavation units.

During in-field analysis, all historical artifacts should be inventoried in the field. This inventory should include actual or estimated counts (depending on total numbers) by material category as well as a characterization of the range of forms in each category and the probable associated functions. Artifacts with the potential to provide specific chronological, functional, cultural, and economic information—for example, items with makers' marks and distinctive forms and decorations—should be measured, described, photographed from multiple angles with a photograph scale, and, if necessary and appropriate, illustrated to show diagnostic elements. Artifact classes most likely to be observed at historical sites include glass, metal, and ceramic artifacts. Other industrial materials such as plastics, rubber, and milled lumber are also likely to be encountered. The analysts should record both the morphological and functional attributes of the artifacts. Functional categories (based on South [1977] and Sprague [1981]) should also be recorded for the artifacts observed (i.e., clothing, firearms, architecture, recreation, kitchen, medical and hygiene, etc.). These should be adapted on a site-specific basis to best reflect the range of activities at a site. For instance, at mining, industrial, or agricultural sites, tools specific to those industries may appear in the assemblage, and the analyst may opt to create a relevant functional category like "mining" or "farming." To capture the necessary information during in-field analysis, specialized field analysis forms should be developed for the primary artifact classes. These forms should prompt the author to record specimen attributes, sizes, and contexts.

Projects may entail the limited or intensive collection of artifacts from historical sites. During collection, artifacts should be sorted by material type. Ceramic, glass, and metal are likely to be the most abundant material types, but rubber, wood, shell, plastic, textiles, and other materials may also be represented. Some historical materials—like asbestos-bearing pipes, insulation, and shingles—are a hazard to health and safety and should not be collected or rigorously handled. Some materials, like very small metal fragments, may be too degraded to provide any insights during laboratory analysis and should not be collected or curated. Materials that are not collected should still be analyzed in the field with actual or estimated counts, functions (if known), and general descriptions provided on field forms. During laboratory analysis, artifacts should be assessed and entered into a database that includes both morphological and provenience information. Glass artifacts—likely to include bottles, jars, dishes, lamp chimneys, and window glass—should be examined for manufacturing method, glass color, shape, decoration, closure type, base or neck finish, labeling or embossing, makers' marks, and other diagnostic characteristics. Metal artifacts, which typically include a wide variety of cans, buckets, utensils, tools, machinery parts, automotive parts, cartridge cases, barrel hoops, nails, wire, and other items, should be examined for any characteristics that are diagnostic of function, point of origin, and period of manufacture. Ceramic artifacts may include tableware, cooking and storage vessels, decorative items, dolls, marbles, and insulators. These artifacts should be examined for clay body or paste, glaze, makers' marks, decoration, and any other diagnostic characteristics that may be present. Functional categories should also be assessed for all artifacts regardless of material class (see South 1977 and Sprague 1981). While there are several material classes of historical artifacts, those most commonly found at historical sites include metal, glass, and ceramic and are discussed in detail below. Additional material types include rubber, shell, plastic, milled wood, textiles, graphite, organic waste, food, construction debris, and paper.

Metal

Metal, one of the most common artifact types at historical sites, is generally classified and discussed by manufacturing technique and function. Metal items are generally manufactured using one of three primary techniques; these may be sheet-formed (e.g., cans, bottle caps, and jar lids), cast (e.g., bolts and screws, animal shoes, and tools), or drawn (e.g., ferrous wire and wire nails). Depending on the type of metal artifact, diagnostic markers may be present that include manufacturers' marks such as headstamps on cartridges and buttons, soldering techniques and seam types on cans, and cut and penny size of nails. During analysis, metal should be classified based on material type (ferrous, brass/copper, other), then subdivided by artifact type, followed by measurements of specific types such as cans and nails where measurements are a diagnostic tool. Both printed and online sources are available to identify date of manufacture for metal artifacts (Ball 1997; Barnes 2003; Fontana and Greenleaf 1962; Rock 1987).

Glass

Glass is another common artifact type present at historical sites and most often represented by container glass. To identify container glass, morphological attributes and other characteristics should include vessel shape or form, vessel part, color, finish type, base type, manufacturing technique, finishing technique, maker's mark, and product embossing. These traits are used to determine the manufacturer of the container, its contents, and its probable function. Attributes such as technology (mold-blown vs. machine-made), color, contents, and manufacturer are used to date sites and features, and characteristics such as overall shape, base shape, size, and finish can be used to determine the container's function.

Color is an important characteristic in the study of glass artifacts because it is often the only recordable attribute. Color can convey information on when the container was made and the product the container held. Common colors for pre-World War I glass containers are aqua, amethyst, amber, olive, and, to a lesser extent, white and cobalt. Glass that has not been colored with a metallic oxide will naturally be a light green hue rather than colorless. In order to clear the glass and make the container's contents seem more pure, manufacturers added either manganese (from ca. 1880 to 1920) or selenium (from 1917 until the early 1950s) during the manufacturing process (Berge 1980:77–78; Lindsey 2024a; Newman 1970:74).[1] When exposed to sunlight, manganese-decolored glass will turn purple or amethyst, while selenium-decolored glass turns a yellowish amber or straw color. These colors define the range of years when the glass was made.

Color can also convey information about contents. For example, brown or amber glass has been used for beer bottles since 1880, although prior to about 1910 beer was also packaged in aqua bottles (Ward et al. 1977:240). Dark green or olive-colored glass is suggestive of wine or champagne bottles (Fike 2006:13; Lindsey 2024a), especially if other attributes are present such as push-up bases or champagne finishes (Lindsey 2024b). White or milk glass and dark blue or cobalt glass were often used for medicines, cosmetics, and toiletries (Fike 2006:13). Color, although an important characteristic of glass, should be used in conjunction with other characteristics before conclusions can be reached about container function.

The shape or form of a glass container is sometimes indicative of its contents. For example, beer bottles have a typical shape, as do jars that held pickled vegetables or preserves (Lindsey 2024c, 2024d, 2024e; Lockhart 2007; Zumwalt 1980). Many bottle styles were used for a wide variety of products, so additional evidence such as a label or embossing that specifies the contents is required to narrow down the possibilities. Herskovitz (1978:4) and Lindsey (2024f) are useful guides to identify bottle shape.

The finish of a glass container is every part of the container above the neck, including the opening (or bore) and the morphology of the surrounding glass. The finish can provide information about the technology used to make the container such as whether it was made by hand or by an automatic bottle machine (ABM) and about the container's contents. ABM finishes have unique attributes that restrict their manufacture to a specific date range (Lindsey 2024b). The same is true of the finishing technique on early handmade or mold-blown bottles (Lindsey 2024b). In addition, while some finishes were used on bottles that might hold a range of products—ink, liquor, pickles, horseradish—certain finishes are commonly associated with specific products. For instance, a crown finish generally means that the bottle held a carbonated beverage, and a prescription finish is indicative of medicine (Fike 2006; Lindsey 2024b).

The ABM was invented by Michael J. Owens in 1903 and licensed for use in 1905. By the 1910s, it had come to dominate the bottling industry (Lindsey 2024b; Lockhart et al. 2010). Before the ABM, all bottles were made by either free-blowing the container or blowing the glass within a metal mold. The use of the latter technique became prevalent in the early 1800s (Lindsey 2024b). Unlike ABMs, which formed the finish automatically within the mold, the finish of mold-blown bottles had to be created by hand using one

[1] Selenium was substituted for manganese around 1917 when the latter became unavailable from its primary supplier, Germany, during World War I (Berge 1980:78).

of two methods: (1) applying an additional gob of glass, which was then shaped with a specialized tool into various finish types or (2) by simply tooling the existing bore (Lindsey 2024b). These distinct finishing techniques—applied and tooled—are easily identified on bottle finishes and are useful in dating mold-blown bottles. Most bottles produced between the early 1800s and the late 1880s have applied finishes; tooled finishes were more common between circa 1885 and the early 1900s (Lindsey 2024b). Tooled finishes are further grouped into the standard type (ca. 1885–early 1900s) and the improved version (ca. 1895–early 1900s) (Lindsey 2024b). It should be noted, however, that these dates are general ones, and exceptions exist.

Embossing or molding words, letters, numbers, and shapes into the sides, panels, shoulders, heels, and bases of bottles and jars did not become common until the mid-nineteenth century. The heyday of the embossed bottle was fairly brief, however, and by the 1890s only 40 percent of bottles were embossed (Fike 2006:4). Besides the obvious uses in designating the manufacturer of the bottle, embossing also provided a way to indicate the patent date, contents, or amount of the product in the container, which was common on patent medicines during the late 1800s and early 1900s. Other labeling methods included glued-on paper labels and, after 1934, applied color labels.

Glass makers used unique symbols and stylized text to identify their products (Lindsey 2024g; Toulouse 1971; Whitten 2024). Embossing on a container, generally the base, can convey information about the maker of the container and its contents. Glass makers' marks are useful in dating a site, especially when combined with other time-sensitive morphological characteristics such as manufacturing method, finishing technique, and color.

Ceramics

When encountering historical ceramics, they should be sorted by ware and vessel form and examined for decoration, makers' marks, and other distinguishing characteristics. Historical ceramics consist of two types of wares: (1) soft-paste earthenware and (2) white-bodied earthenware. Soft-paste earthenware is produced from naturally colored clay and is fired at a relatively low temperature. This product is opaque, non-vitreous, and porous and has to be glazed for domestic use. White-bodied earthenware includes semi-vitreous and vitreous whitewares. These wares have a white body and a white or clear glaze. Whiteware originated in the British ceramic tradition that dominated the American market from the late 1700s until the 1880s, at which time the American ceramic industry, which sprang up following the Civil War, gained enough momentum to compete with the imported wares (Majewski and O'Brien 1987:114–115). Whitewares can be further subdivided into three categories: (1) non-vitreous, (2) semi-vitreous, and (3) vitreous. Of the three, non-vitreous whiteware is fired at the lowest temperature, is the most porous, and is the earliest, with an introduction date of circa 1820. Manufacture of semi-vitreous whiteware began in the 1840s. This ware differs from non-vitreous wares in that it is fired at higher temperatures and is less porous.

Vitreous whitewares, introduced in the 1880s, were fired at high temperatures and featured very low porosity (White et al. 2010:51). Lastly, porcelain is fired at a very high temperature, making it translucent and vitreous (no visible grain). Hard-paste porcelain is true china and includes Japanese and Chinese porcelain. Soft-paste porcelain includes types such as bone china and glass porcelain. These were attempts by Europeans and Americans to duplicate true porcelain and are considered a semi-porcelain because, although vitreous, they were fired at a lower temperature than porcelain, producing a paste that had a granular texture, especially toward the center of the walls of the vessel.

Decorated ceramics can be used to interpret the socioeconomic status of the people who used them (Baugher and Venables 1987; Manson and Snyder 1996; Miller 1980, 1991). In addition, decorative techniques used on ceramics were influenced by contemporary fashions and can help determine a vessel's date and function.

The techniques used for decorating commercially manufactured ceramics varied according to time period and vessel function. Hand-painting was one of the earliest decorative techniques and has been used on tableware and various decorative vessels since about 1765. Relief molding, a raised decoration molded onto a vessel before glazing, was most popular from the 1840s until around 1900. Transfer prints, found primarily on tablewares and decorative vessels, feature a design that was applied by transferring ink from copper plates by way of paper sheets to a vessel. This decorative type is recognized by the presence of a single color with an almost stippled appearance. Transfer printing was introduced in the 1780s and underwent two separate peaks in popularity: (1) 1820–1850 and (2) 1870–1890 (White et al. 2010:52). Most makers' marks were applied using a transfer print. Decal designs, recognizable by the use of multiple colors applied over the glaze, were used on tablewares and decorative vessel forms in the United States after 1900 (White et al. 2010:52).

Finally, makers' marks are also useful for dating ceramic artifacts and the features where they are found because many pottery manufacturers used specific marks or versions of marks during well-defined, historically documented periods.

REPORTING

Weekly Status Reports

The consulting archaeologist will provide the CAO with weekly updates via electronic mail during the fieldwork. The updates will be sent to the CAO (City Archaeologist and archaeology@phoenix.gov) and the appropriate person(s) in the sponsoring department(s). The updates will include a summary of the field activities and the results of the work. If critical discoveries arise during the fieldwork, including human remains encounters, all ground-disturbing activities will cease in the vicinity of the encounter and the CAO will be contacted immediately and allowed time to properly assess them. Quarterly reports will be sent to the CAO during analyses and report preparation. These reports should give updates on the status of the project, any problems encountered, and any significant findings.

End-of-fieldwork Reports

The CAO often requests end-of-fieldwork (EOF) reports that are reviewed and approved by the City Archaeologist so that construction may proceed while data analyses and technical reporting are underway. For federal projects, these reports would be sent to the consulting agencies and Tribes for Section 106 consultation. The schedule for submittal of the EOF report will depend on the size and complexity of the archaeological investigations. The EOF report shall include the results of the fieldwork; a map showing the work area, excavation units, and features (if any); and the identification and explanation of any deviations from the work plan addendum. The EOF report must provide recommendations but need not include detailed analytical results. The EOF report is not a replacement for a comprehensive technical report. The EOF report may be submitted in letter format.

Draft and final comprehensive technical reports must meet the requirements of the *City of Phoenix Guidelines for Archaeology* (COP 2020a or as updated) as well as all applicable professional standards such as those issued by the SHPO and the ASM.

Data Recovery Report

A draft Data Recovery Report that conforms to SHPO and ASM reporting standards should be submitted to the COP Archaeologist and sponsoring COP department(s) for review within one year of the completion of all fieldwork and data analyses. Exceptionally large and complex projects will require more time for the completion of a draft data recovery report. The number of final hard copy reports for consulting parties is to be determined by the COP Archaeologist and the COP department(s), as stipulated in the *City of Phoenix Guidelines for Archaeology* (COP 2020a or as updated). Schedules for report submittals vary by report type and are included in the COP guidelines (2020a or as updated).

The content of the reports should include, at a minimum:

- A report cover
- A title page listing the title, authors, firm's name and address, date, contract number, report number, project number, permit number(s), and sponsor
- An abstract in COP format (for projects conducted under an AAA permit, the abstract must also include all elements specified in Arizona Antiquities Act Minimum Requirements and Checklist for Reports, Treatment Plans, and Maps available via the ASM website)
- A table of contents
- Acknowledgements
- An introduction discussing the purpose of the project, the federal permitting aspect, and the project background
- Project setting
- An environmental overview
- A cultural overview
- Previous research (site files and records searches)
- Description and background of the site (if applicable)
- Research domains and questions
- Field methods and laboratory procedures
- Feature descriptions
- Data recovery analyses and results
- Data interpretations and discussions from both a local and a regional perspective and comparisons to the research goals outlined in the HPTP
- Summary, syntheses, and conclusions
- References
- Appendices
- Professional-quality maps and photographs

If human remains are encountered, a separate Report of Remains will be submitted to the ASM Repatriation Office and the designated lead claimants.

Spatial Data Submittal Standards

The CAO prefers that spatial data be submitted within their PMAP template geodatabase and that all required pieces of information are included. Although the CAO will accept consultant data in its original spatial data format, they strongly encourage consulting archaeologists to request and populate the CAO's blank template geodatabase. The template can be requested by emailing archaeology@phoenix.gov and putting "Template Geodatabase Request" in the subject line.

Naming Conventions

To facilitate data processing at the CAO, information should adhere to these naming conventions:

- **Geodatabase:** The supplied geodatabase schema will be renamed with the S'e̱dav Va'aki Museum project number followed by the name prior to inclusion with the project deliverables. Upon request, the CAO will provide the specific project file naming convention.

- **Minimal Field Completion:** Contractors are asked to complete, at a minimum, the fields within the geodatabase template in the following tables.

PG* Project Area Template

Field Name	Field Alias	Field Type	Description	
PGM_PROJ_ID	PGM Project ID	Text(25)	PGM Project Number	
SITE_ID	Site ID	Text(25)	Site Identifier	Required Field
SOURCE_ID	Source ID	Text(25)	Original Identifier (if applicable)	Optional Field
PROJ_ACRE	Acreage	Numeric	Acreage of Project Area Shape	Internal PGM Field
SOURCE_ORG	Organization	Text(50)	Name of organization who collected data.	
SOURCE_DATE	Date Documented	Date	Date Data was Generated (if applicable)	
SOURCE_DATA	Data Source	Text(25)	Format Data was Generated In (e.g. GPS, RTK, Total Station, Digitized, Shapefile)	
DATA_DATE	Last Updated	Date	Date Data Was Last Updated	
DATA_AUTHOR	Data Author	Text(25)	Author of Data	
PROJ_TYPE	Project Type	Text(80)	Project Activity Type (E.g. data recovery, monitoring, etc.)	
Project_Name	Project Name	Text(254)	Name of Project	

* PG or PGM should be replaced with SV or SVM where appropriate.

PG* Excavation Unit Template

Field Name	Field Alias	Field Type	Description	
PGM_EXCV_ID	Excavation ID	Text(25)	Internal PGM Excavation Unit Identifier	
SITE_ID	Site ID	Text(25)	Site Identifier	Required Field
SOURCE_ID	Source ID	Text(25)	Unit Identifier Assigned by Recording Organization	Optional Field
EXCV_TYPE	Activity Type	Text(25)	Excavation Activity Type (E.g. Trench, stripping area, excavation unit, etc.)	Internal PGM Field
PGM_RPOJ_ID	PGM Project ID	Text(25)	PGM Project Number	
SOURCE_DATE	Date Documented	Date	Date Data was Generated (if applicable)	
SOURCE_DATA	Data Source	Text(25)	Format Data was Generated In (e.g. GPS, RTK, Total Station, Digitized, Shapefile)	
DATA_DATE	Last Updated	Text(25)	Date Data Was Last Updated	
DATA_AUTHOR	Data Author	Text(25)	Author of Data	

* PG or PGM should be replaced with SV or SVM where appropriate.

PG* Site Feature Template

Field Name	Field Alias	Field Type	Description	
PGM_FEA_ID	PGM ID	Text(25)	Internal PGM Feature Identifier	
FEA_CAT	Category	Numeric (Subtype)	Broad descriptive categories for features, select from: -Architecture -Historic -Human Burial -Pit -Water Feature -Other	
FEA_SOURCE	Source Type	Text(100)	Specific Feature Classification Assigned by Recording Organization	Required Field
FEA_AGE	Age	Text(12)	Period Class (e.g. historic, prehistoric)	Optional Field
FEA_AGE_DESC	Age Description	Text(50)	Specific Cultural-temproal Period Affiliation	Internal PGM Field
SITE_ID	Site ID	Text(25)	Site Identifier	
SOURCE_ID	Source ID	Text(25)	Feature Identifier Assigned by Recording Organization	
PGM_PROJ_ID	PGM Project ID	Text(150)	PGM Project Number	
SOURCE_DATE	Date Documented	Date	Date Data was Generated (if applicable)	
SOURCE_DATA	Data Source	Text(25)	Format Data was Generated In (e.g. GPS, RTK, Total Station, Digitized, Shapefile)	
DATA_DATE	Last Updated	Date	Date Data Was Last Updated	
DATA_AUTHOR	Data Author	Text(25)	Author of Data	
Start_end_proj_dates	Start End Project Dates	Text(120)	Start and end dates for the project	
PROJ_TYPE	Project Type	Text(80)	Project Activity Type (E.g. data recovery, monitoring, etc.)	
Source_Cit	Source Citation	Text(320)	Citation for Project Report	
Comments	Comments	Text(320)	Any Additional Comments	
Fea_Type	Feature Type	Text(50)	Internal PGM Assigned Feature Type	
Checked	Checked	Text(8)	Internal PGM Check Field.	

* PG or PGM should be replaced with SV or SVM where appropriate.

Permission to Publish or Give Presentations with COP-sponsored Project Data

Because cultural resources are non-renewable and have intimate connections to living cultures, it is the policy of the CAO to discourage using COP archaeological data for presentations or publications until project excavations have been entirely completed and construction has commenced. Presentations at conferences, published articles, and other research publications using COP project data require permission from the COP. The CAO must be contacted in writing (email is fine) with a proposed title and abstract and details regarding the publication (publisher) or presentation (specific conference, etc.).

CURATION

All project-related materials should be submitted to the S'e̱dav Va'aki Museum unless otherwise stated for curation under a project-specific repository agreement obtained by the consulting archaeologist prior to fieldwork. Materials anticipated to be curated include notes, field maps, photographs, electronic and paper copies of the project report, and artifacts. All materials are to be prepared according to the S'e̱dav Va'aki Museum's most recent standards. For any projects conducted under AAA permits, copies of the final report (and other standard deliverables) will also be submitted to the ASM. If human remains are encountered, a separate Report of Remains will be submitted to the ASM Repatriation Office and the designated lead claimants.

CONSULTATION PROTOCOL

As previously noted, this general HPTP is designed to meet the requirements of various types of projects that may occur within the city boundary or on land owned or controlled by the COP. The project types that may be covered by this HPTP are state- or federally funded projects, COP-funded projects, and privately funded projects requiring a permit from the COP.

For federal projects (those that have federal land, funding, permitting, or other involvement), the general HPTP along with the Addendum Form would be used for Section 106 Consultation (36 CFR Part 800, Subpart B). Consultation for these projects will be conducted according to the Section 106 implementing regulations.

For state-funded projects, the general HPTP along with the Addendum Form would be used for compliance under the Arizona State Historic Preservation Act. The appropriate state agency would initiate consultation with the SHPO and Tribes to determine the adequacy of the Addendum Form and the general HPTP for the proposed cultural resource investigations.

City-funded or privately funded projects do not require consultation with the SHPO unless they have some other state of federal involvement. For these types of projects, the Addendum Form would need to be reviewed and approved by the sponsoring COP department and the COP Archaeologist. There is no required time limit for the duration of the review period for city- or privately funded projects, although COA staff generally completes reviews within a 30-day period as well.

REFERENCES

Abbott, David R.

1988 Form, Function, Technology, and Style in Hohokam Ceramics. In *The 1982–1984 Excavations at Las Colinas: Material Culture*, edited by David R. Abbott, Kim E. Beckwith, Patricia L. Crown, R. Thomas Euler, David A. Gregory, J. Ronald London, Marilyn B. Saul, Larry A. Schwalbe, and Mary Bernard-Shaw, pp. 73–198. Archaeological Series 162(4). Arizona State Museum, University of Arizona, Tucson.

1994b Synthesis and Conclusions. In *The Pueblo Grande Project, Vol. 3: Ceramics and the Production and Exchange of Pottery in the Central Phoenix Basin, Part One*, edited by David R. Abbott, pp. 407–432. Soil Systems Publications in Archaeology No. 20, Vol. 3. Soil Systems, Inc., Phoenix.

2001 Conclusions for the GARP Ceramic Analysis. In *The Grewe Archaeological Research Project, Vol. 2: Material Culture, Part I: Ceramic Studies*, edited by David R. Abbott, pp. 263–272. Anthropological Papers No. 99-1. Northland Research, Inc., Tempe.

2009 Extensive and Long-term Specialization: Hohokam Ceramic Production in the Phoenix Basin, Arizona. *American Antiquity* 74(3):531–557.

2023 What We Know and What We Wished We Knew about Hohokam Platform Mounds. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 102–112. University of Utah Press, Salt Lake City.

Abbott, David R. (ed.)

1994a *Pueblo Grande Project, Vol. 3: Ceramics and the Production and Exchange of Pottery in the Central Phoenix Basin*. Publications in Archaeology No. 20. Soil Systems, Inc., Phoenix.

2000 *Ceramics and Community Organization among the Hohokam*. University of Arizona Press, Tucson.

Abbott, David R., and Michael S. Foster

2003 Site Structure, Chronology, and Population. In *Centuries of Decline during the Hohokam Classic Period at Pueblo Grande*, edited by David R. Abbott, pp. 24–47. University of Arizona Press, Tucson.

Abbott, David R., and David A. Gregory

1988 Hohokam Ceramic Wares and Types. In *The 1982–1984 Excavations at Las Colinas: Material Culture*, edited by David R. Abbott, Kim E. Beckwith, Patricia L. Crown, R. Thomas Euler, David A. Gregory, J. Ronald London, Marilyn B. Saul, Larry A. Schwalbe, and Mary Bernard-Shaw, pp. 5–28. Archaeological Series 162(4). Arizona State Museum, University of Arizona, Tucson.

Abbott, David R., Cory Dale Breternitz, and Christine K. Robinson

2003 Challenging Conventional Conceptions. In *Centuries of Decline during the Hohokam Classic Period at Pueblo Grande*, edited by David R. Abbott, pp. 1–23. University of Arizona Press, Tucson.

Abbott, David R., Andrew D. Lack, Alexa M. Smith, and Henry D. Wallace

2012 A Manual and Graphical Guide for Hohokam Decorated Ceramics from the Middle Gila River Valley: Towards a Systematic Approach to Hohokam Pottery Classification. *Journal of Arizona Archaeology* 2(1):51–79.

Abbott, David R., Alexa M. Smith, and Emiliano Gallaga

2007 Ballcourts and Ceramics: The Case for Hohokam Marketplaces in the Arizona Desert. *American Antiquity* 72(3):461–484.

Ackerly, Neal W., and T. Kathleen Henderson (eds.)

1989 *Prehistoric Agricultural Activities on the Lehi-Mesa Terrace: Perspectives on Hohokam Irrigation Cycles.* Northland Research, Inc., Flagstaff.

Ackerly, Neal W., Jerry B. Howard, and Randall H. McGuire

1987 *La Ciudad Canals: A Study of Hohokam Irrigation Systems at the Community Level*. Anthropological Field Studies 17, Vol. 2. Arizona State University, Tempe.

Adams, Jenny L.

1989 Replication of the Use of Ground Stone Tools. *Kiva* 54(3):261–271.

1996 *A Manual for a Technological Approach to Ground Stone Analysis*. Center for Desert Archaeology, Tucson.

1999 Refocusing the Role of Food-grinding Tools as Correlates for Subsistence Strategies in the U.S. Southwest. *American Antiquity* 64(3):475–498.

2002 *Ground Stone Analysis: A Technological Approach*. University of Utah Press, Salt Lake City.

2014 *Ground Stone Analysis: A Technological Approach*. Second edition. University of Utah Press, Salt Lake City.

Ahlstrom, Richard V. N., and Francis E. Smiley

1998 Chapter 1: Perspectives of Chronometric Dating with Radiocarbon and Tree Rings. In *Archaeological Chronometry: Radiocarbon and Tree-ring Models and Applications on Black Mesa, Arizona*, edited by Francis E. Smiley and Richard V. N. Ahlstrom, pp. 3–12. Center for Archaeological Investigations Occasional Paper No. 16. Southern Illinois University, Carbondale.

Aitken, M. J.

1990 *Science-based Dating in Archaeology*. Routledge Publishing, New York.

Andrefsky, William, Jr.

1994 Raw-material Availability and the Organization of Technology. *American Antiquity* 5(9):21–34.

Antevs, Ernst V.

1983 Geological Dating. In *The Cochise Cultural Sequence in Southeastern Arizona*, edited by E. B. Sayles, pp. 26–43. Anthropological Papers No. 42. University of Arizona Press, Tucson.

Antieau, John M.

1981 *The Palo Verde Archaeological Investigations, Hohokam Settlement at the Confluence: Excavations along the Palo Verde Pipeline*. Research Papers 20. Museum of Northern Arizona, Flagstaff.

Archaeology Southwest

2020 Pieces of the Puzzle: Hohokam or Huhugam? Electronic document at: https://www.archaeologysouthwest.org/exhibit/online-exhibits/pieces-puzzle/piece-1/. Accessed January 3, 2024.

Arizona Historical Archaeology Advisory Committee

2019 *A Guide to Documenting Historical In-use Structures*. Arizona Historical Archaeology Advisory Committee, Arizona State Historic Preservation Office, Phoenix.

Arizona State Museum (ASM)

2023a *Culture History of Southern Arizona: Europeans Arrive*. Electronic document at: https://statemuseum.arizona.edu/online-exhibit/culture-history-southern-arizona/europeans. Accessed May 30, 2023.

2023b Archaeological Repository Interim Guidance Regarding Project Submission Standards. Electronic document at: https://statemuseum.arizona.edu/sites/default/files/arch_repository_manual_interim_guidance-2023-10-25.pdf. Accessed October 25, 2023.

Arp, Ryan, and Summer Peltzer

2022 *End of Fieldwork Report for Phase II Data Recovery at AZ U:9:67(ASM) and Testing at AZ U:9:264(ASM) in Phoenix, Arizona.* Cultural Resource Services Technical Paper No. 2022-33. Environmental Planning Group, Phoenix.

Arp, Ryan, and Steve Swanson

2021 Hohokam Craft Production: New Evidence from the Massera Ruin (AZ U:10:22[ASM]). *Journal of Arizona Archaeology* 8(2):157–172.

Bahr, Donald M., Juan Smith, William Smith Allison, and Julian Hayden

1994 *The Short Swift Time of Gods on Earth: The Hohokam Chronicles.* University of California Press, Berkeley.

Ball, Donald B.

1997 Types, Headstamps, and Chronology of Winchester Shotgun Shells, 1877–1973. *Ohio Valley Historical Society* 12:130–140.

Ballenger, Jesse A., Vance T. Holliday, and Guadelupe Sánchez

2017 The Earliest People in the Southwest. In *The Oxford Handbook of Southwest Archaeology*, edited by Barbara Mills and Severin Fowles, pp. 209–230. Oxford University Press, Oxford.

Bamforth, Douglas B.

1991 Technological Organization and Hunter-gatherer Land Use: A California Example. *American Antiquity* 56:216–234.

Barnes, Frank C.

2003 *Cartridges of the World.* Tenth edition. Krause Publications, Iola, Wisconsin.

Bauer, Sharon K., and A. E. (Gene) Rogge

1998 *The Archaeology of the Lost and Found at the Phoenix Indian School: An Inventory of Artifacts Collected by Metal Detector Hobbyists.* Technical Report No. 98-3. Pueblo Grande Museum, Phoenix.

Baugher, Sherene, and Robert W. Venables

1987 Ceramics as Indicators of Status and Class in Eighteenth Century New York. In *Consumer Choice in Historical Archaeology*, edited by Suzanne M. Spencer-Wood, pp. 31–54. Plenum Press, New York.

Bayman, James M.

1992 The Circulation of Exotics in a Tucson Basin Platform Mound Community. In *Proceedings of the Second Salado Conference, Globe, AZ, 1992*, edited by Richard C. Lange and Stephen Germick, pp. 31–37. Arizona Archaeological Society, Phoenix.

1996 Shell Ornament Consumption in a Classic Hohokam Platform Mound Community Center. *Journal of Field Archaeology* 23(4):1–18.

1999 Craft Economies in the North American Southwest. *Journal of Archaeological Research* 7(3):249–299.

2001 The Hohokam of Southwest North America. *Journal of World Prehistory* 15(3):257–311.

2002a Hohokam Craft Economies and the Materialization of Power. *Journal of Archaeological Method and Theory* (9)1:69–95.

2002b *Marine Shell Artifact Studies on the Gila River Indian Community, Arizona*. P-MIP Technical Report No. 2002-08. Gila River Indian Community, Sacaton.

2018 From Hohokam Archaeology to Narratives of the Ancient Hawaiian "State." *Journal of Arizona Archaeology* 6(1):1–12.

Bayman, James M., and M. Steven Shackley

1999 Dynamics of Hohokam Obsidian Circulation in the North American Southwest. *Antiquity* 73:836–845.

Bayman, James M., Manuel R. Palacios-Fest, and Lisa W. Huckell

1997 Botanical Signatures of Water Storage Duration in a Hohokam Reservoir. *American Antiquity* 62(1):103–111.

Bayman, James M., Manuel R. Palacios-Fest, Suzanne K. Fish, and Lisa W. Huckell

2004 The Paleoecology and Archaeology of Long-term Water Storage in a Hohokam Reservoir, Southwestern Arizona, U.S.A. *Geoarchaeology: An International Journal* 19(2):119–140.

Beck, Charlotte, and George T. Jones

1997 The Terminal Pleistocene/Early Holocene Archaeology of the Great Basin. *Journal of World Prehistory* 11(2):161–236.

Bennett, Matthew R., David Bustos, Daniel Odess, Tommy M. Urban, Jens N. Lallensack, Marcin Budka, Vincent L. Santucci, Patrick Martinez, Ashleigh LA Wiseman, and Sally C. Reynolds

2020 Walking in Mud: Remarkable Pleistocene Human Trackways from White Sands National Park (New Mexico). *Quaternary Science Reviews* 249:106610.

Berge, Dale L.

1980 *Simpson Springs Station, Historical Archaeology in Western Utah, 1974–1975*. Cultural Resource Series No. 6. Bureau of Land Management, Utah State Office, Salt Lake City.

Berger, Glenn W., T. Kathleen Henderson, D. Banerjee, and Fred L. Nials

2004 Photonic Dating of Prehistoric Irrigation Canals at Phoenix, Arizona, U.S.A. *Geoarchaeology: An International Journal* 19:1–19.

Bilsbarrow, Matthew H.

2003 *SHPO Position on the Roles of Archaeological Testing*. Guidance Point No. 2. Arizona State Historic Preservation Office, Phoenix.

Binford, Lewis R.

1978 *Nunamiut Ethnoarchaeology*. Academic Press, New York.

1979 Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research* 35:255–273.

Bohrer, Vorsila L.

1981 Methods of Recognizing Cultural Activity from Pollen in Archaeological Sites. *Kiva* 46(3):135–142.

Boldurian, Anthony T., and John L. Cotter

1999 *Clovis Revisited: New Perspectives on Paleoindian Adaptations from Blackwater Draw, New Mexico.* The University Museum, University of Pennsylvania, Philadelphia.

Bostwick, Todd W.

1993 Albert Schroeder's Excavations and the 1938–1940 WPA Salt River Valley Stratigraphic Survey. In *Archaeology of the Pueblo Grande Platform Mound and Surrounding Features, Vol. 1: Introduction to the Archival Project and History of Archaeological Research*, edited by C. E. Downum and T. W. Bostwick, pp. 193–224. Anthropological Papers No. 1. Pueblo Grande Museum, Phoenix.

Bostwick, Todd W., and James H. Burton

1993 A Study in Sourcing Hohokam Basalt Ground Stone Implements. *Kiva* 58(3):357–372.

Bostwick, Todd W., and Christian E. Downum

1994 Site Structure and Ceremony at Pueblo Grande. In *Archaeology of the Pueblo Grande Platform Mound and Surrounding Features, Vol. 2: Features in the Central Precinct of the Pueblo Grande Community*, edited by Todd W. Bostwick and Christian E. Downum, pp. 297–386. Anthropological Papers No. 1. Pueblo Grande Museum, Phoenix.

Bostwick, Todd W., David H. Greenwald, and Mary-Ellen Walsh

1996 The Hohokam Post-Classic Period Occupation and an Early Piman Presence on the Salt River Floodplain. In Chapter 17 in *Life on the Floodplain: Further Investigations at Pueblo Salado for Phoenix Sky Harbor International Airport, Vol. 2: Data Recovery and Re-evaluation, Part 1: The Report*, edited by David H. Greenwald, Jean H. Ballagh, Douglas R. Mitchell, and Richard A. Anduze. Anthropological Papers No. 4. Pueblo Grande Museum, Phoenix.

Bostwick, Todd W., Douglas R. Mitchell, Laurene Montero, and Christian E. Downum

2023 A Monument for Memory: The Pueblo Grande Platform Mound. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 148–166. University of Utah Press, Salt Lake City.

Brew, S. A., and B. B. Huckell

1987 A Protohistoric Piman Burial and a Consideration of Piman Burial Practices. *The Kiva* 52(3):163–191.

Brodbeck, Mark

2015 *A Final Class III Survey of the W59 and E1 Alignments for the South Mountain Freeway, Maricopa County, Arizona*. Report No. 15-2. HDR Engineering, Inc., Phoenix.

Brown, David E. (ed.)

1994 *Biotic Communities: Southwestern United States and Northwestern Mexico*. University of Utah Press, Salt Lake City.

Brown, P. E., and C. L. Stone (eds.)

1982 *Granite Reef: A Study in Desert Archaeology*. Anthropological Research Papers No. 28. Arizona State University, Tempe.

Bryant, Vaughn M., Jr., and Richard G. Holloway

1983 The Role of Palynology in Archaeology. *Advances in Archaeological Method and Theory* 6:191–224.

Buikstra, Jane E., and Douglas H. Ubelaker

1994 *Standards for Data Collection from Human Skeletal Remains*. Research Series No. 44. Arkansas Archeological Survey, Fayetteville.

Burt, William H., and Richard P. Grossenheider

1976 *The Field Guide to the Mammals of America North of Mexico*. Houghton-Mifflin, Boston.

Cable, John S., and David E. Doyel

1985 The Pueblo Patricio Sequence: Its Implications for the Study of Hohokam Origins, Pioneer Period Site Structure, and the Processes of Sedentism. In *City of Phoenix Archaeology of the Original Townsite: Block 24-East*, edited by John S. Cable, Kathleen S. Hoffman, David E. Doyel, and Frank Ritz, pp. 211–270. Publications in Archaeology No. 8. Soil Systems, Inc., Phoenix.

1986 *The 1986 Archaeological Investigations at Las Canopas, Phoenix, Arizona.* Report No. 1986-28. Pueblo Grande Museum, Phoenix.

1987 Pioneer Period Village Structure and Settlement Pattern in the Phoenix Basin. In *The Hohokam Village: Site Structure and Organization*, edited by David E. Doyel, pp. 21–70. Southwest and Rocky Mountain Division of the American Association for the Advancement of Science, Glenwood Springs.

Cable, John S., and Douglas R. Mitchell

1989 Intrasite Structure, Chronology, and Community Organization of the Grand Canal Ruins. In *Archaeological Investigations at the Grand Canal Ruins: A Classic Period Site in Phoenix, Arizona*, edited by Douglas R. Mitchell, pp. 793–878. Publications in Archaeology No. 12. Soil Systems, Inc., Phoenix.

1991 Settlement Growth and Integration in a Large Hohokam Canal System. In *Prehistoric Irrigation in Arizona: Symposium 1988*, edited by Cory D. Breternitz, pp. 89–106. Publications in Archaeology No. 17. Soil Systems, Inc., Phoenix.

Cable, John S., Susan L. Henry, and David E. Doyel (eds.)

1982 *City of Phoenix, Archaeology of the Original Townsite: Blocks 1 and 2.* Publications in Archaeology No. 1. Soil Systems, Inc., Phoenix.

1983 *City of Phoenix, Archaeology of the Original Townsite: Block 28-North.* Publications in Archaeology No. 2. Soil Systems, Inc., Phoenix.

1984 *City of Phoenix, Archaeology of the Original Townsite: The Murphy's Addition.* Publications in Archaeology No. 3. Soil Systems, Inc., Phoenix.

Cable, John S., Kathleen S. Hoffman, David E. Doyel, and Frank Ritz (eds.)

1985 *City of Phoenix, Archaeology of the Original Townsite: Block 24-East.* Publications in Archaeology No. 8. Soil Systems, Inc., Phoenix.

Carlson, David, Jeanne Swarthout, and Stan Freer

1989 Lithic Technology along the All American Pipeline. In *Cultural Resources Report for the All American Pipeline Project*, pp. 647–678. New Mexico State University, Las Cruces.

Carr, Phillip J. (ed.)

1994 *The Organization of North American Chipped Stone Tool Technologies*. International Monographs in Prehistory, Archaeology Series 7. Ann Arbor.

Caseldine, Christopher Robert

2020a *Hohokam Irrigation Longevity and Agricultural Success in the Lower Salt River Valley, Arizona.* Unpublished Ph.D. dissertation. Arizona State University, Tempe.

2020b A Reevaluation of Mesoamerica in the Southwest through the Examination of Hohokam and Northwest Mexican Relationships South of the Lower Salt River, Central Arizona. *Journal of Arizona Archaeology* 7(2):200–215.

Castetter, Edward F., and Willis H. Bell

1942 *Pima and Papago Indian Agriculture*. Inter-American Series Studies No. 1. University of New Mexico Press, Albuquerque.

Chang, Kwang-Chih

1958 Study of the Neolithic Social Grouping: Examples from the New World. *American Anthropologist* 60:298–334.

Charest, Jeffrey P.

2021 *Results of Archaeological Data Recovery at a Portion of Las Moradas, AZ T:12:3(ASM), on Privately Owned Land in Phoenix, Maricopa County, Arizona.* Cultural Resources Report 2021-002. WestLand Resources, Inc., Phoenix.

Charest, Jeffrey P., and Mark L. Chenault (eds.)

2019 *Archaeological Testing and Data Recovery at AZ T:12:52(ASM) in Support of the 59th and Lower Buckeye Distribution Center Project*. Report 2019-12. WestLand Resources, Inc., Tucson.

Chenault, Mark L.

1996 *The Polvorón Phase and the Hohokam Collapse*. Unpublished Ph.D. dissertation. Department of Anthropology, University of Colorado, Boulder.

2000 In Defense of the Polvorón Phase. In *The Hohokam Village Revisited*, edited by David E. Doyel, Suzanne K. Fish, and Paul R. Fish, pp. 277–286. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Ft. Collins.

2016 Ritual and Duality: Early Agricultural Period Figurines from the Tucson Basin. *Kiva* 82(4):387–402.

2017 *Preliminary Report of Findings: Archaeological Phase II Data Recovery at AZ T:12:52(ASM) in the Area of Potential Effects of the South Mountain Freeway Construction.* Cultural Resources Report 2017-21. WestLand Resources, Inc., Tucson.

2018 *Preliminary Report of Findings: Archaeological Phase II Data Recovery at a Portion of AZ T:12:52(ASM) (Site 52 East) in the Area of Potential Effects of the South Mountain Freeway Construction.* Cultural Resources Report 2018-63. WestLand Resources, Inc., Tucson.

2021 *Preliminary Report of Findings: Archaeological Phase II Data Recovery at a Portion of AZ T:12:52(ASM) (Site 52 West) in the Area of Potential Effects of the South Mountain Freeway Construction.* Cultural Resources Report 2021-12. WestLand Resources, Inc., Tucson.

Chenault, Mark L., and David H. Greenwald

1990 *Archaeological Testing of a Portion of Pueblo del Alamo, Site AZ T:12:18(ASU)*. SWCA, Flagstaff.

Chenault, Mark L., Richard V. N. Ahlstrom, and Thomas N. Motsinger (eds.)

1993 *In the Shadow of South Mountain: The Pre-Classic Hohokam of La Ciudad de los Hornos, 1991–1992 Excavations*. Archaeological Report No. 93-30. SWCA Environmental Consultants, Inc., Tucson.

Chenault, Mark L., M. Zyniecki, Thomas N. Motsinger, David H. Greenwald, Kathleen S. McQuestion, and Jean H. Ballagh

1995 Pueblo Salado, Area 8/9. In *Early Desert Farming and Irrigation Settlements: Archaeological Investigations in the Phoenix Sky Harbor Center, Vol. 3: Pueblo Salado*, edited by David H. Greenwald, Mark L. Chenault, and Dawn M. Greenwald, pp. 15–119. Anthropological Research Paper Number 4. SWCA, Inc. Environmental Consultants, Flagstaff and Tucson.

Ciolek-Torrello, Richard

2023 When is a Platform Mound: A Focus on Diversity and Function. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 113–130. University of Utah Press, Salt Lake City.

Clark, Jeffery J., and David R. Abbott

2017 Classic Period Hohokam. In *The Oxford Handbook of Southwest Archaeology*, edited by Barbara J. Mills and Severin Fowles, pp. 353–379. Oxford University Press, Oxford.

Cobb, Charles R., Jeffrey Maymon, and Randall H. McGuire

1999 Feathered, Horned, and Antlered Serpents: Mesoamerican Connections with the Southwest and Southeast. In *Great Towns and Regional Polities in the Prehistoric American Southwest and Southeast*, edited by J. E. Neitzel, pp. 165–182. University of New Mexico Press, Albuquerque.

Cohen, Andrew S., and Chris Nielsen

1986 Ostracodes as Indicators of Paleohydrochemistry in Lakes: A Late Quaternary Example from Lake Elmenteita, Kenya. *Palaios* 1(6):601–609.

Collins, Jan

2005 Revolutionizing First American Thinking? The Topper Site has Yielded a Bounty of Clovis Evidence. Will it also Demolish the Clovis First Model? *American Archaeology* 9(4):12–17.

Collins, William S.

1999 *The New Deal in Arizona*. Arizona State Historic Preservation Office, Phoenix.

Cordell, Linda S., and Maxine E. McBrinn

2012 *Archaeology of the Southwest*. Third edition. Left Coast Press, Walnut Grove.

Courtright, J. Scott

2004 *Archaeological Investigations at La Lomita, AZ U:9:67(ASM).* Anthropological Papers No. 14. Pueblo Grande Museum, Phoenix.

Cox, Eric S.

2022 *End of Fieldwork Report for Phase II Data Recovery for Locus A of AZ T:12:137(ASM)/Las Canopas at the Northeast Corner of South 32nd Street and Southern Avenue, Phoenix, Maricopa County, Arizona.* Technical Report No. 22-448. PaleoWest, Phoenix.

Cox, Eric S., and A. E. (Gene) Rogge

2004 *Preliminary Results of Archaeological Testing for Phase 1 of the Civic Plaza Expansion Project, Phoenix, Arizona.* Cultural Resource Report 2004-5(AZ). URS Corporation, Phoenix.

Craig, Douglas B. (ed.)

2005 *Archaeological Excavations at La Villa (AZ T:12:148[ASM]): The Maricopa County Human Services Campus, Phoenix, Maricopa County, Arizona.* Report No. 05-94. Northland Research, Inc., Tempe.

Craig, Douglas B., and M. Kyle Woodson

2017 Preclassic Hohokam. In *The Oxford Handbook of Southwest Archaeology*, edited by Barbara J. Mills and Severin Fowles, pp. 323–351. Oxford University Press, Oxford.

Crown, Patricia L.

1981 Analysis of the Las Colinas Ceramics. In *The 1968 Excavations at Mound 8, Las Colinas Ruins Group, Phoenix, Arizona*, edited by Laurens C. Hammack and Alan P. Sullivan, pp. 87–169. Archaeological Series No. 154. Arizona State Museum, University of Arizona, Tucson.

1983 Introduction: Field Houses and Farmsteads in South-central Arizona. In *Small Habitation Sites on Queen Creek: Hohokam Archaeology along the Salt-Gila Aqueduct Central Arizona Project, Vol. 5*, edited by Lynn S. Teague and Patricia L. Crown, pp. 3–22. Archaeological Series No. 150. Arizona State Museum, University of Arizona, Tucson.

1991a The Hohokam: Current Views of Prehistory and the Regional System. In *Chaco and Hohokam: Prehistoric Regional Systems in the American Southwest*, edited by Patricia L. Crown and W. James Judge, pp. 135–157. School of American Research Press, Santa Fe.

1991b The Role of Exchange and Interaction in Salt-Gila Basin Hohokam Prehistory. In *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*, edited by George J. Gumerman, pp. 383–415. University of New Mexico Press, Albuquerque.

Crown, Patricia L., and Earl W. Sires

1984 The Hohokam Chronology and Salt-Gila Aqueduct Project Research. In *Hohokam Archaeology along the Salt-Gila Aqueduct Central Arizona Project, Vol. 9: Synthesis and Conclusions*, edited by Lynn S. Teague and Patricia L. Crown, pp. 73–85. Archaeological Series No. 150. Arizona State Museum, University of Arizona, Tucson.

Crown, Patricia L., Larry A. Schwalbe, and J. Ronald London

1988 X-ray Fluorescence Analysis of Materials Variability in Las Colinas Ceramics. In *The 1982–1984 Excavations at Las Colinas: Material Culture*, by David R. Abbott, Kim E. Beckwith, Patricia L. Crown, R. Thomas Euler, David A. Gregory, J. Ronald London, Marilyn B. Saul, Larry A. Schwalbe, and Mary Bernard-Shaw, pp. 29–72. Archaeological Series No. 162(4). Arizona State Museum, University of Arizona, Tucson.

Crownover, C. Scott

1994 *Archaeological Assessment of the North Landfill Project, Biscuit Flat, Arizona*. Archaeological Consulting Services, Ltd., Tempe.

Czarzasty, John, and Glen E. Rice (eds.)

2009 *Excavations at Las Canopas: A Hohokam Village in the Phoenix Basin.* Anthropological Papers No. 17. Pueblo Grande Museum, Phoenix.

Daniels, Farrington, Charles A. Boyd, and Donald F. Saunders

1953 Thermoluminescence as a Research Tool. *Science* 117(3040):343–349.

Darling, J. Andrew

2005 *A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain Freeway Corridor Study Area, Maricopa County, Arizona*. Arizona Department of Transportation, Phoenix.

Darling, J. Andrew, and Harry J. Winters, Jr.

2021 Paḍ 'Aangam: Protohistoric Landscape Archaeology and Ethnohistory in the O’Odham Creation Tradition. *Journal of Arizona Archaeology* 9(1):17–30.

Dart, Allen

1986 Sediment Accumulation along Hohokam Canals. *The Kiva* 51(2):63–84.

Dean, David R., and Jean A. Reynolds

2004 *African American Historic Property Survey*. City of Phoenix Historic Preservation Office, Phoenix.

2006 *Hispanic Historic Property Survey, Final Report.* City of Phoenix Historic Preservation Office, Phoenix.

Dean, Jeffrey S.

1991 Thoughts on Hohokam Chronology. In *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*, edited by George J. Gumerman, pp. 61–150. Amerind Foundation, Dragoon, and University of New Mexico Press, Albuquerque.

Deats, Jennifer K., and Eric S. Cox

2021 *Results of Cultural Resource Monitoring within AZ T:12:220(ASM)/Las Cremaciones at South 39th Avenue and West Vineyard Road in Phoenix, Maricopa County, Arizona.* Technical Report No. 21-453. PaleoWest, Phoenix.

Deaver, William L.

1988 Identifying Contemporary Archaeological Events through a Comparison of Archaeomagnetic Directions. In *The 1982–1984 Excavations at Las Colinas: The Site and its Features*, edited by David A. Gregory, William L. Deaver, Suzanne K. Fish, Ronald Gardiner, Robert W. Layhe, Fred L. Nials, and Lynn S. Teague, pp. 73–120. Archaeological Series 162(2). Arizona State Museum, University of Arizona, Tucson.

1990 Native American Ceramics. In *Archaeology of the Ak Chin Indian Community, West Side Farms Project: Material Culture and Human Remains*, compiled by Robert E. Gasser, Christine K. Robinson, and Cory Dale Breternitz, Chapter 15. Publications in Archaeology 9. Soil Systems, Inc., Tempe.

2004 Archaeomagnetic Dating. In *Pots, Potters, and Models: Archaeological Investigations at the West Branch Site*, edited by Stephanie M. Whittlesey and Karen G. Harry, pp. 101–130. Technical Series 80. Statistical Research, Inc., Tucson.

Deaver, William L., and Jennifer E. Hider

2017 Pottery Assemblage Inventory and Tabulation. In *Phase II Data Recovery at Pozos de Sonoqui/ AZ U:14:49(ASM) within the Proposed Alignment of Riggs Road in Queen Creek, Maricopa County, Arizona,* edited by Mark L. Chenault, pp. 312–387. Jacobs Project Report No. 2014-005. Jacobs Engineering Group, Phoenix. Environmental Program Archaeological Report 1. Maricopa County Department of Transportation, Phoenix.

DeJong, David H.

2011 *Forced to Abandon Our Fields, the 1914 Clay Southworth Gila River Pima Interviews*. University of Utah Press, Salt Lake City.

Desert Archaeology

2013 *Seeds of Growth: Neighborhoods on the Salt River Floodplain.* Desert Archaeology, Tucson.

Dobschuetz, Kris

2004 *Archaeological Investigations at the Las Canopas Site, AZ T:12:137(ASM), City of Phoenix, Maricopa County, Arizona.* Cultural Resource Research Report No. 2004-1438b. Environmental Planning Group, Phoenix.

Doelle, William H.

1980 *Past Adaptive Patterns in Western Papagueria: An Archaeological Study of Non-riverine Resource Use.* Unpublished Ph.D. dissertation. Department of Anthropology, University of Arizona, Tucson.

Doelle, William H., and Henry D. Wallace

1991 The Changing Role of the Tucson Basin in the Hohokam Regional System. In *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*, edited by George J. Gumerman, pp. 279–346. University of New Mexico Press, Albuquerque.

Doelle, William H., Frederick Huntington, and Henry Wallace

1987 Rincon Phase Reorganization in the Tucson Basin. In *The Hohokam Village: Site Structure and Organization*, edited by David E. Doyel, pp. 71–95. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Glenwood Springs.

Dongoske, K. E., Yeatts, M., Anyon, R., & Ferguson, T. J.

1997 Archaeological Cultures and Cultural Affiliation: Hopi and Zuni Perspectives in the American Southwest. *American Antiquity* 62(4): 600–608.

Douglas, John E., and Douglas B. Craig

1986 *Investigations of Archaic and Hohokam Sites on the Flying V Ranch, Tucson, Arizona.* Archaeological Report No. 13. Pima Community College, Tucson.

Downum, Christian E. (ed.)

1998 *Archaeology of the Pueblo Grande Platform Mound and Surrounding Features, Vol. 4: The Pueblo Grande Platform Mound Compound.* Anthropological Papers No. 1. Pueblo Grande Museum, Phoenix.

Downum, Christian E., and Todd W. Bostwick

2003 The Platform Mound. In *Centuries of Decline during the Hohokam Classic Period at Pueblo Grande*, edited by David R. Abbott, pp. 166–200. University of Arizona Press, Tucson.

Downum, Christian E., and Todd W. Bostwick (eds.)

1993 *Archaeology of the Pueblo Grande Platform Mound and Surrounding Features, Vol. I: Introduction to the Archival Project and History of Archaeological Research.* Anthropological Papers No. 1. Pueblo Grande Museum, Phoenix.

Doyel, David E.

1974 *Excavations in the Escalante Ruin Group, Southern Arizona*. Archaeological Series No. 37. Arizona State Museum, University of Arizona, Tucson.

1980 Hohokam Social Organization and the Sedentary to Classic Transition. In *Current Issues in Hohokam Prehistory: Proceedings of a Symposium*, edited by David E. Doyel and Fred Plog, pp. 23–40. Anthropological Research Papers No. 23. Arizona State University, Tempe.

1981 *Late Hohokam Prehistory in Southern Arizona*. Contributions to Archeology 2. Gila Press, Scottsdale.

1991a Hohokam Cultural Evolution in the Phoenix Basin. In *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*, edited by George J. Gumerman, pp. 231–278. Amerind Foundation Publication and University of New Mexico Press, Albuquerque.

1991b Hohokam Exchange and Interaction. In *Chaco and Hohokam: Prehistoric Regional Systems in the American Southwest*, edited by Patricia L. Crown and W. James Judge, pp. 225–252. School of American Research Press, Santa Fe.

1993 On Rivers and Boundaries in the Phoenix Basin, Arizona. *Kiva* 58(4):455–474.

1996 Resource Mobilization and Hohokam Society: Analysis of Obsidian Artifacts from the Gatlin Site. *Kiva* 62:45–60.

1998 Vacant Ceremonial Centers Revisited. *Kiva* 64:225–244.

2000 The Santan Phase in the Phoenix Basin. In *The Hohokam Village Revisited*, edited by David E. Doyel, Suzanne K. Fish, and Paul R. Fish, pp. 221–244. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Ft. Collins.

2023 The Gatlin Site Platform Mound. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 85–101. University of Utah Press, Salt Lake City.

Doyel, David E. (ed.)

1987 *The Hohokam Village: Site Structure and Organization*. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Glenwood Springs.

Doyel, David E., and Mark D. Elson (eds.)

1985 *Hohokam Settlement and Economic Systems in the Central New River Drainage, Arizona.* Publications in Archaeology 4. Soil Systems, Inc., Phoenix.

Doyel, David E., and Suzanne K. Fish

2000 Prehistoric Villages and Communities in the Arizona Desert. In *The Hohokam Village Revisited*, edited by David E. Doyel, Suzanne K. Fish, and Paul R. Fish, pp. 1–35. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Ft. Collins.

Dunn, Mary Eubanks

1983 Phytolith Analysis in Archaeology. *Midcontinental Journal of Archaeology* 8(2):287–297.

Effland, Richard (compiler)

1990 *Archaeological Investigations at La Ciudad de los Hornos: The Lassen Substation Parcel*. Arizona Archaeologist No. 24. Arizona Archaeological Society, Phoenix.

Eighmy, Jeffrey L.

1980 *Archaeomagnetism: A Handbook for the Archaeologist*. U.S. Department of the Interior, Interagency Archeological Services, Heritage Conservation and Recreation Service No. 58. Washington, D.C.

Eighmy, Jeffrey L., and Randall H. McGuire

1989 *Archaeomagnetic Dates and the Hohokam Phase Sequence*. Technical Series 3. Archaeometric Laboratory, Colorado State University, Ft. Collins.

Eiselt, B. Sunday, Rachel S. Popelka-Filcoff, J. Andrew Darling, and Michael D. Glascock

2011 Hematite Sources and Archaeological Ochres from Hohokam and O'odham Sites in Central Arizona: An Experiment in Type Identification and Characterization. *Journal of Archaeological Science* 38(11):3019–3028.

Elson, Mark D.

2023 Platform Mounds and Ethnographic Analogy Revisited: Defining the Functional Universe. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 29–38. University of Utah Press, Salt Lake City.

Elson, Mark D., and David R. Abbott

2000 Organizational Variability in Platform Mound-building Groups of the American Southwest. In *Alternative Leadership Strategies in the Prehispanic Southwest*, edited by Barbara J. Mills, pp. 117–135. University of Arizona Press, Tucson.

Ezell, Paul H.

1983 History of the Pima. In *Southwest*, edited by Alfonso Ortiz, pp. 149–160. *Handbook of North American Indians*, Vol. 10, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Faught, Michael K., and Andrea K. L. Freeman

1998 Paleoindian Complexes of the Terminal Wisconsin and Early Holocene. In *Paleoindian and Archaic Sites in Arizona*, edited by Jonathan B. Mabry, pp. 33–52. Technical Report 97-7. Center for Desert Archaeology, Tucson.

Ferguson, T. J. and Micah Lomaomvaya

1999 *Hoopoq'yaqam Niqw Wukoskyavi (Those Who Went to the Northeast and Tonto Basin): Hopi-Salado Cultural Affiliation Study.* Hopi Cultural Preservation Office, Kykotsmovi, Arizona.

Ferguson, T. J. and Patrick Lyons

2003 *Yep Hisat Hoopoq'yaqam Yeesiwa (Hopi Ancestors Were Once Here) Hopi-Hohokam Cultural Affiliation Study.* Hopi Cultural Preservation Office, Kykotsmovi, Arizona.

Fertelmes, Craig M.

2014 *Vesicular Basalt Provisioning Practices among the Prehistoric Hohokam of the Salt-Gila Basin, Southern Arizona.* Unpublished Ph.D. dissertation. Arizona State University, Tempe.

Fertelmes, Craig M., and Mark R. Hackbarth (eds.)

2022 *Multi-phased Data Recovery and Archaeological Monitoring within the Original Block 66 of the Tempe Historic Townsite, AZ U:9:309(ASM), for the 100 Mill Development Project, Tempe, Arizona.* Technical Report Nos. 195015b and 195198c. Logan Simpson, Tempe.

Fertelmes, Craig M., David R. Abbott, and M. Steven Shackley

2012 Obsidian Source Characterization at Las Colinas: Shifting Exchange Patterns during the Hohokam Sedentary-Classic Transition. *Kiva* 77(3):281–312.

Fertelmes, Craig M., J. Andrew Darling, Jacqueline Fox, Dave Field, and Justin Rego

2022 *A Class III Cultural Resources Survey and Ethnographic Study of* Nanakmel Kii/Qmpanyk Nyiva *(Bell Butte), Tempe, Maricopa County, Arizona.* Technical Report No. 195017a. Logan Simpson, Tempe.

Fike, Richard E.

2006 *The Bottle Book: A Comprehensive Guide to Historic Embossed Medicine Bottles.* Reprint of the 1987 edition. Peregrine Smith Books, Salt Lake City.

Fish, Paul R., and Suzanne K. Fish

1991 Hohokam Political and Social Organization. In *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*, edited by George J. Gumerman, pp. 151–175. Amerind Foundation Publication, Dragoon, and University of New Mexico Press, Albuquerque.

Fish, Suzanne K., and Paul R. Fish

2000 The Institutional Contexts of Hohokam Complexity and Inequality. In *Alternative Leadership Strategies in the Prehispanic Southwest*, edited by Barbara J. Mills, pp. 154–167. University of Arizona Press, Tucson.

2022 Multiethnic Dimensions of Agriculture in Hohokam Society. In *Borderlands Histories: Ethnographic Observations and Archaeological Interpretations*, edited by John P. Carpenter and Matthew Pailes, pp. 111–134. University of Utah Press, Salt Lake City.

2023 West Mexican Connections and Classic Period Hohokam Platform Mounds. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 39–60. University of Utah Press, Salt Lake City.

Flannery, Kent V., and Marcus C. Winter

1976 Analyzing Household Activities. In *The Early Mesoamerican Village*, edited by Kent V. Flannery, pp. 34–47. Academic Press, New York.

Fontana, Bernard L., and J. Cameron Greenleaf

1962 Johnny Ward's Ranch: A Study in Historic Archaeology. *Kiva* 28(1–2):1–115.

Foster, Michael S. (ed.)

1994a *The Pueblo Grande Project, Vol. 1: Introduction, Research Design, and Testing Results.* Publications in Archaeology No. 20. Soil Systems, Inc., Phoenix.

1994b *The Pueblo Grande Project, Vol. 4: Material Culture.* Publications in Archaeology No. 20. Soil Systems, Inc., Phoenix.

Foster, Michael S., and M. Kyle Woodson

2002 Water and Humans in Prehistoric Arizona. In *Prehistoric Water Utilization and Technology in Arizona*, edited by Michael Foster, Kyle Woodson, and Gary Huckleberry, pp. 11–40. A Component of the Arizona Historic Preservation Plan. Arizona State Historic Preservation Office, Phoenix.

Foster, Michael S., Chris North, and Gary Huckleberry

2006 *Archaeological Data Recovery in a Portion of AZ U:9:67(ASM)–La Lomita: The Escala Central City Project.* Cultural Resources Report No. 06-108. SWCA, Inc., Phoenix.

France, Diane L.

2009 *Human and Nonhuman Bone Identification*. CRC Press, New York.

Freeman, Andrea

1999 Status of the Middle Archaic in Southern Arizona. In *Excavation in the Santa Cruz River Floodplain: The Middle Archaic Component at Los Pozos*. Paper No. 20. Desert Archaeology, Tucson.

Garrison, James, James Woodward, Susan Wilcox, Robert Trennert, and James Ayers

1989 *Transcontinental Railroading in Arizona 1878–1940: A Context for Preserving Railroad Related Properties*. Janus Associates Incorporated, Phoenix.

Gasser, Robert E., and Scott M. Kwiatkowski

1991 Food for Thought: Recognizing Patterns in Hohokam Subsistence. In *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*, edited by George J. Gumerman, pp. 417–460. Amerind Foundation New World Studies Series No. 1. University of New Mexico Press, Albuquerque.

Gasser, Robert E., and Charles Miksicek

1985 The Specialists: A Reappraisal of Hohokam Exchange and the Archaeobotanical Record. In *Proceedings of the 1983 Hohokam Conference*, edited by Alfred E. Dittert, Jr., and Donald E. Dove, pp. 483–498. Occasional Paper No. 2, Part 2. Arizona Archaeological Society, Phoenix.

Gasser, Robert E., Christine K. Robinson, and Cory D. Breternitz

1990 *Archaeology of the Ak-Chin Indian Community West Side Farms Project: Subsistence Studies and Synthesis and Interpretation*. Publications in Archaeology No. 9(5). Soil Systems, Inc., Phoenix.

Gilbert, B. Miles

1980 *Mammalian Osteology*. B. Miles Gilbert, Laramie.

Gilbert, B. Miles, Larry D. Martin, and Howard G. Savage

1981 *Avian Osteology*. B. Miles Gilbert, Laramie.

Gilpin, Dennis, and David A. Phillips, Jr.

1998 *The Prehistoric to Historic Transition Period in Arizona, circa A.D. 1519 to 1692*. Arizona State Historic Preservation Office, Phoenix.

Gladwin, Harold S.

1928 *Excavations at Casa Grande, Arizona: February 12–May 1, 1927.* Southwest Museum Papers No. 2. Southwest Museum, Los Angeles.

Gladwin, Harold S., Emil W. Haury, E. B. Sayles, and Nora Gladwin

1937 Excavations at Snaketown: Material Culture. Medallion Papers No. 25. Gila Pueblo, Globe.

Gladwin, Winifred, and Harold S. Gladwin

1929 *The Red-on-buff Culture of the Gila Basin*. Medallion Papers No. 3. Pasadena.

Glass, Bryan P., and Monte L. Thies

1997 *A Key to the Skulls of North American Mammals.* Third edition. Self-published through the Department of Biological Sciences, Sam Houston State University, Huntsville.

Goodyear, City of

2024 *Forever in Service*. Electronic document at: https://www.goodyearairport.com/about-gyr-airport/history/. Accessed January 19, 2024.

Graves, William M., Robert M. Wegener, Richard Ciolek-Torrello, and Gary Huckleberry

2011 Settlement and Production at the Cashion Site Complex: The Early Archaic and Hohokam Periods at AZ T:11:94(ASM). *Journal of Arizona Archaeology* 1(2):148–161.

Greenwald, David H.

1995 Pueblo Salado, Area 20. In *Early Desert Farming and Irrigation Settlements: Archaeological Investigations in the Phoenix Sky Harbor Center, Vol. 3: Pueblo Salado*, edited by David H. Greenwald, Mark L. Chenault, and Dawn M. Greenwald, pp. 161–169. Anthropological Research Paper Number 4. SWCA, Inc. Environmental Consultants, Flagstaff and Tucson.

Greenwald, David H., Jean H. Ballagh, and M. Zyniecki (eds.)

1996 *Life on the Floodplain: Further Investigations at Pueblo Salado for Phoenix Sky Harbor International Airport.* Anthropological Papers No. 4. Pueblo Grande Museum, Phoenix.

Greenwald, David H., Mark L. Chenault, and Dawn M. Greenwald (eds.)

1995 *Early Desert Farming and Irrigation Settlements: Archaeological Investigations in the Phoenix Sky Harbor Center, Vol. 3: Pueblo Salado.* Anthropological Research Paper Number 4. SWCA, Inc. Environmental Consultants, Flagstaff and Tucson.

Gregory, Andrea

2012 Shell Analysis. In *Archaeological Excavations at the Northwestern Edge of La Plaza, a Hohokam Village Site in Tempe, Arizona, Vol. 1*, edited by Eric S. Cox and A. E. Rogge, pp. 10.1–10.31. Cultural Report 2012-11(AZ). URS Corporation, Phoenix.

Gregory, David A.

1988 The Changing Spatial Structure of the Mound 8 Precinct. In *The 1982–1984 Excavations at Las Colinas: The Mound 8 Precinct*, edited by David A. Gregory, pp. 25–50. Archaeological Series 162, Vol. 3. Arizona State Museum, Tucson.

1991 Chapter Eight: Form and Variation in Hohokam Settlement Patterns. In *Chaco and Hohokam: Prehistoric Regional Systems in the American Southwest*, edited by Patricia L. Crown and W. James Judge, pp. 159–193. School of American Research Press, Santa Fe.

Gregory, David A. (ed.)

1999 *Excavations in the Santa Cruz River Floodplain: The Middle Archaic Component at Los Pozos*. Anthropological Papers No. 20. Center for Desert Archaeology, Tucson.

2001 *Excavations in the Santa Cruz River Floodplain: The Early Agricultural Period Component at Los Pozos*. Anthropological Papers No. 21. Center for Desert Archaeology, Tucson.

Gregory, David A., and Fred L. Nials

1985 Observations Concerning the Distribution of Classic Period Platform Mounds. In *Proceedings of the 1983 Hohokam Symposium, Part I*, edited by Alfred E. Dittert, Jr., and Donald E. Dove, pp. 373–388. Occasional Paper No. 2. Arizona Archaeological Society, Phoenix.

Gregory, David A., William L. Deaver, Suzanne K. Fish, Ronald Gardiner, Robert W. Layhe, Fred L. Nials, and Lynn S. Teague

1988 *The 1982–1984 Excavations at Las Colinas: The Site and its Features.* Archaeological Series 162, Vol. 2. Cultural Resource Management Division, Arizona State Museum, University of Arizona, Tucson.

Griset, Suzanne, Arthur W. Vokes, Catherine Sarther, and Teresa Moreno

2004 *Requirements for the Preparation of Archaeological Project Collections for Submission to the Arizona State Museum*. Electronic document at: http://www.statemuseum.arizona.edu/crservices/forms.shtml. Arizona State Museum, Tucson.

Hackbarth, Mark R.

1997 *Archaeological and Archival Investigations of Las Canopas: The Esteban Park Project.* Anthropological Papers No. 6. Pueblo Grande Museum, Phoenix.

1998 *Archaic and Hohokam Occupation of the Mayo Boulevard Project Area in Northeast Phoenix, Arizona*. Anthropological Papers No. 8. Pueblo Grande Museum, Phoenix.

2001 Late Archaic and Red Mountain Phase Task Group Size in Paradise Valley, Arizona: Evidence from the Last Ditch Site. *Kiva* 67(1):81–106.

2010 *Phoenix Convention Center Investigations, Vol. 1: Archaeological Investigations of Pueblo Patricio in Blocks 11, 12, 17, and 18 of the Original Phoenix Townsite, Phoenix, Arizona*. LSD Technical Report No. 5 and PGM Anthropological Papers No. 16. Logan Simpson Design, Inc., and Pueblo Grande Museum, Phoenix.

2012a Prehistoric Cemetery Spatial Organization in Southern Arizona. *Kiva* 77(3):313–357.

2013 *Results of Phase II Data Recovery Excavations within Block 58 and Phase II Archaeological Monitoring within Blocks 58 and 70 of the Original Phoenix Townsite, Phoenix, Maricopa County, Arizona.* Technical Report No. 125010f. Logan Simpson Design, Inc., Tempe.

2019 Late Archaic and Early Formative Architecture in the Salt River Valley, Arizona. *Journal of Arizona Archaeology* 7(1):42–68.

Hackbarth, Mark R. (ed.)

2009 *The Phoenix Convention Center Excavations, Vol. 1: Archaeological Investigations of Pueblo Patricio in Blocks 11, 12, 17, and 18 in the Original Phoenix Townsite, Phoenix, Arizona.* LSD Technical Reports in Prehistory No. 5. Anthropological Papers No. 16, Pueblo Grande Museum, Phoenix.

2012b *The CityScape Project: Archaeological Investigations of Pueblo Patricio and Block 22 of the Original Phoenix Townsite, Phoenix, Maricopa County, Arizona.* Technical Reports in Prehistory No. 6, Logan Simpson Design Inc., Phoenix. Anthropological Papers No. 18, Pueblo Grande Museum, Phoenix.

2022 *Archaeological Investigations within Original Blocks 57 and 63 of AZ U:9:309(ASM)/Tempe Townsite, the Tempe Depot Project, Tempe, Maricopa County, Arizona.* Technical Report No. 195613d. Logan Simpson, Tempe.

Hall, John D.

2018 The Phoenix Basin Archaic. In *The Archaic Southwest: Foragers in an Arid Land*, edited by Bradley J. Vierra, pp. 52–66. University of Utah Press, Salt Lake City.

Hall, John D. (ed.)

2020 *Pioneer to Classic Period Occupation of Pueblo del Alamo, AZ T:12:52(ASM): The 59LBR Logistics Terminal Project, Phoenix, Maricopa County, Arizona*. Project No. 65187408. Terracon Consultants, Inc., Tempe.

Hall, John D., and Robert M. Wegener (eds.)

2017 *The Luke Air Force Base Solar Project – 5,000 Years of Aboriginal Land Use in the Western Phoenix Basin: Project Background and Excavation Results*. Technical Series 95, Vol. 2. Statistical Research, Inc., Tucson.

Hallenback, Cleve

1983 *The Journey of Fray Marcos de Niza*. Southern Methodist University Press, Dallas.

Halseth, Odd S.

1936 Prehistoric Irrigation in the Salt River Valley. Reprinted from *The University of New Mexico Bulletin*, University Press, Albuquerque.

Hammack, Laurens C., and Alan P. Sullivan (eds.)

1981 *The 1968 Excavations at Mound 8, Las Colinas Ruins Group, Phoenix, Arizona*. Archaeological Series No. 154. Cultural Resource Management Section, Arizona State Museum, University of Arizona, Tucson.

Harry, Karen G., and James M. Bayman

2000 Leadership Strategies among the Classic Period Hohokam. In *Alternative Leadership Strategies in the Prehispanic Southwest*, edited by Barbara J. Mills, pp. 136–153. University of Arizona Press, Tucson.

Hartman, G. W.

1977 *Soil Survey of Maricopa County, Arizona, Central Part*. U.S. Department of Agriculture, Washington, D.C.

Haury, Emil W.

1937 Pottery Types at Snaketown. In *Excavations at Snaketown: Material Culture,* by Harold S. Gladwin, Emil W. Haury, E. B. Sayles, and Nora Gladwin, pp. 169–229. Medallion Papers No. 25. Gila Pueblo, Globe.

1945 *The Excavation of Los Muertos and Neighboring Ruins in the Salt River Valley, Southern Arizona*. Peabody Museum of Archaeology and Ethnology Papers, Harvard.

1975 *The Stratigraphy and Archaeology of Ventana Cave*. Second printing. University of Arizona Press, Tucson.

1976 *The Hohokam: Desert Farmers and Craftsmen, Excavations at Snaketown, 1964–1965.* University of Arizona Press, Tucson.

Hayden, Julian D.

1976 Pre-Altithermal Archaeology in the Sierra Pinacate, Sonora. *American Antiquity* 41:274–289.

1998 *The Sierra Pinacate.* Southwest Center Series. University of Arizona Press, Tucson.

Haynes, C. Vance, Jr., and Bruce B. Huckell

1986 *Sedimentary Successions of the Prehistoric Santa Cruz River, Tucson, Arizona*. Arizona Bureau of Geology and Mineral Technology, University of Arizona, Tucson.

Heathington, Carol Ann, and David A. Gregory (eds.)

1985 *The 1982–1984 Excavations at Las Colinas: Research Design.* Archaeological Series 162, Vol. 1. Cultural Resource Management Division, Arizona State Museum, University of Arizona, Tucson.

Heilen, Michael P.

2004 Julian Hayden's Malpais Model: A Pre-Clovis Claim from the American Southwest. *Kiva* 69(3): 305–331.

Heilman, Jill, Daniel H. Sorrell, and Jason Sperinck

2008 *An Archaeological Monitoring Report for Two City of Phoenix Waterline Improvement Projects Located in an Area Bounded by 33rd and 27th Avenues and Van Buren and Roosevelt Streets, Maricopa County, Arizona.* Report Nos. 06-970:91 and 06-970:93. EcoPlan Associates, Inc., Mesa.

Henderson, T. Kathleen

1986 *Site Structure and Development at La Ciudad: A Study of Community Organization.* Unpublished Ph.D. dissertation. Department of Anthropology, Arizona State University, Tempe.

1987 *Structure and Organization at La Ciudad*. Archaeological Field Studies No. 18. Arizona State University, Tempe.

1989 Dating the Tempe Outer Loop Features. In *Prehistoric Agricultural Activities on the Lehi-Mesa Terrace: Excavations at La Cuenca del Sedimento*, edited by T. Kathleen Henderson, pp. 74–103. Northland Research, Inc., Flagstaff.

2002 Chronology. In *The Grewe Archaeological Research Project, Vol. 1: Project Background and Feature Descriptions*, edited by Douglas B. Craig, pp. 163–208. Anthropological Papers No. 99-1. Northland Research, Inc., Flagstaff and Tempe.

2020 *General Monitoring and Discovery Plan for the City of Phoenix, Maricopa County, Arizona*. Pueblo Grande Museum Project No. 2017-009. City of Phoenix, Parks and Recreation Department, City Archaeology Office, Pueblo Grande Museum, Phoenix.

Henderson, T. Kathleen (ed.)

1995 *The Prehistoric Archaeology of Heritage Square.* Anthropological Papers No. 3. Pueblo Grande Museum, Phoenix.

2015 *Hohokam Irrigation and Agriculture on the Western Margin of Pueblo Grande: Archaeology for the PHX Sky Train Project.* Anthropological Papers No. 41, Archaeology Southwest, Tucson. Anthropological Papers No. 19, Pueblo Grande Museum, Phoenix.

2016 *Settling the Salt River Floodplain: Perspectives from the Community Noise Reduction Program, Phoenix, Arizona*. Technical Report No. 2012-18. Desert Archaeology, Inc., Phoenix.

2019 *In the Shadow of the PHX Sky Train: Further Studies of Hohokam Canals and Agricultural Features near Park of Four Waters, Phoenix, Arizona.* Technical Report No. 2014-06, Desert Archaeology, Inc., Tucson. Anthropological Papers No. 21, Pueblo Grade Museum, Phoenix.

Henderson, T. Kathleen, and Mark R. Hackbarth

2000 What is Going on at the Hohokam Village? A Fourteenth and Fifteenth Century Perspective. In *The Hohokam Village Revisited*, edited by David E. Doyel, Suzanne K. Fish, and Paul R. Fish, pp. 287–316. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Ft. Collins.

Henderson, T. Kathleen, and Glen Rice

1987 The Temporal Dimension. In *A Spatial Analysis of the Hohokam Community of La Ciudad*, edited by Glen E. Rice, pp. 49–72. La Ciudad Monograph Series Vol. 1. Office of Cultural Resource Management, Department of Anthropology, Arizona State University, Tempe.

Herskovitz, Robert M.

1978 Fort Bowie Material Culture. Anthropological Papers Number 31. University of Arizona Press, Tucson.

Hesse, Jerome S., and Annick Lascaux (eds.)

2005 *The Cortaro Road Site: 2,800 Years of Prehistory in the Northern Tucson Basin*. Cultural Resources Report No. 03-172. SWCA, Inc., Environmental Consultants, Tucson.

Hill, J. Brett

2019 *From Huhugam to Hohokam: Heritage and Archaeology in the American Southwest.* Lexington Books, London.

Hill, J. Brett, Patrick D. Lyons, Jeffery J. Clark, and William H. Doelle

2015 The “Collapse” of Cooperative Hohokam Irrigation in the Lower Salt River Valley. *Journal of the Southwest* 57:609–674.

Hillson, Simon

1990 *Teeth*. Cambridge University Press, Cambridge.

Hoerig, Karl A.

2022 *Guadalupe Cemetery National Register of Historic Places Nomination*. Pascua Yaqui Tribe, Tucson.

Hohmann, John W.

2003a *Initial Archaeological Data Recovery at Pueblo del Alamo for Newport Development, Phoenix, Maricopa County, Arizona*. Report No. 53. The Louis Berger Group, Inc., Phoenix.

2003b *Additional Archaeological Data Recovery at Pueblo del Alamo for Newport Development, Phoenix, Maricopa County, Arizona*. Report No. 55. The Louis Berger Group, Inc., Phoenix.

2007 *An End of Fieldwork Report for Archaeological Data Recovery at Pueblo del Alamo, Site AZ T:12:52 (ASM), Phoenix, Maricopa County, Arizona*. Report No. 65. The Louis Berger Group, Inc., Phoenix.

Hohmann, John W., Margaret “Peg” Davis, and Bryan Cole

2009a *A Letter Report on Archaeological Testing on the Prologis Property at Pueblo del Alamo, Site AZ T:12:52(ASM), Phoenix, Arizona.* Technical Report No. 69. The Louis Berger Group, Inc., Phoenix.

Hohmann, John W., Margaret “Peg” Davis, Christopher Schaefer, Linda Scott Cummings, and Kathryn Puseman

2009b *Archaeological Data Recovery at Pueblo del Alamo, Site AZ T:12:52(ASM), Phoenix, Maricopa County, Arizona*. Report No. 67. The Louis Berger Group, Inc., Phoenix.

Howard, Ann Valdo

1989 Analysis of the Waddell Ceramic Assemblage. In *Settlement, Subsistence, and Specialization in the Northern Periphery: The Waddell Project*, edited by M. Green, pp. 473–642. Cultural Resources Report No. 65. Archaeological Consulting Services, Ltd., Tempe.

1993 Marine Shell Artifacts and Production Processes at Shelltown and the Hind Site. In *Shelltown and the Hind Site*, edited by William S. Marmaduke and Richard J. Martynec, pp. 321–423. Northland Research, Flagstaff.

Howard, Jerry B.

1985 Courtyard Groups and Domestic Cycling: A Hypothetical Model of Growth. In *Proceedings of the 1983 Hohokam Symposium*, edited by Alfred E. Dittert, Jr., and Donald E. Dove, pp. 311–326. Occasional Paper 2. Arizona Archaeological Society, Phoenix.

1988a Casa Buena Architectural Types and Descriptions. In *Excavations at Casa Buena: Changing Hohokam Land Use along the Squaw Peak Parkway*, edited by Jerry G. Howard, pp. 67–144. Publications in Archaeology No. 11. Soil Systems, Inc., Phoenix.

1988b The Casa Buena Hornos: A Study in Morphology, Typology, Function, and Formation Processes. In *Excavations at Casa Buena: Changing Hohokam Land Use along the Squaw Peak Parkway, Vol. 1*, edited by Jerry B. Howard, pp. 145–200. Publications in Archaeology No. 11. Soil Systems, Inc., Phoenix.

1990 Los Hornos: Site Structure and Community Patterning of a Large Hohokam Village. In *One Hundred Years of Archaeology at La Ciudad de los Hornos*, edited by David B. Wilcox, Jerry B. Howard, and Rueben H. Nelson, pp. 73–110. Publications in Archaeology No. 16. Soil Systems, Inc., Phoenix.

2000 Quantitative Approaches to Spatial Patterning in the Hohokam Village: Testing the Village Segment Model. In *The Hohokam Village Revisited*, edited by David E. Doyel, Suzanne K. Fish, and Paul R. Fish, pp. 167–195. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Fort Collins.

2006 *Hohokam Irrigation Communities: A Study of Internal Structure, External Relationships and Sociopolitical Complexity.* Unpublished Ph.D. dissertation. Department of Anthropology, Arizona State University, Tempe.

Howard, Jerry B. (ed.)

1988 *Excavations at Casa Buena: Changing Hohokam Land Use along the Squaw Peak Parkway, Vols. 1 and 2.* Publications in Archaeology No. 11. Soil Systems, Inc., Phoenix.

Howard, Jerry B., and Gary Huckleberry

1991 *The Operation and Evolution of an Irrigation System: The East Papago Canal Study*. Publications in Archaeology No. 18. Soil Systems, Inc., Phoenix.

Howard, Jerry B., and M. Kyle Woodson

2018 The Development of Prehistoric Irrigation Studies in Arizona under the National Historic Preservation Act. *Journal of Arizona Archaeology* 5(2):114–126.

Huckell, Bruce B.

1984a The Paleo-Indian and Archaic Occupation of the Tucson Basin: An Overview. *Kiva* 49(3–4):133–145.

1984b *The Archaic Occupation of the Rosemont Area, Northern Santa Rita Mountains, Southeastern Arizona.* Archaeological Series Vol. 1, No. 147. Arizona State Museum, University of Arizona, Tucson.

1995 *Of Marshes and Maize: Preceramic Agricultural Settlements in the Cienega Valley, Southeastern Arizona*. Anthropological Papers No. 59. University of Arizona Press, Tucson.

1996 The Archaic Prehistory of the North American Southwest. *Journal of World Prehistory* 10(3):305–373.

Huckell, Bruce B., and C. Vance Haynes, Jr.

2003 The Ventana Complex: New Dates and New Ideas on its Place in Early Holocene Western Prehistory. *American Antiquity* 68:353–371.

Huckleberry, Gary

1999 Assessing Hohokam Canal Stability through Stratigraphy. *Journal of Field Archaeology* 26(1):1–18.

2015 Geoarchaeological Analysis of Prehistoric Canals near Park of Four Waters, PHX Sky Train Project. In *Hohokam Irrigation and Agriculture on the Western Margin of Pueblo Grande: Archaeology for the PHX Sky Train Project*, edited by T. Kathleen Henderson. Anthropological Papers No. 41. Archaeology Southwest, Tucson.

Huckleberry, Gary, and Tammy M. Rittenour

2014 Combining Radiocarbon and Single-grain Optically Stimulated Luminescence Methods to Accurately Date Preceramic Canals, Tucson, AZ. *Journal of Archaeological Science* 41:156–170.

Hunt, Robert C., David Guillet, David R. Abbott, James Bayman, Paul Fish, Suzanne Fish, Keith Kintigh, and James A. Neely

2005 Plausible Ethnographic Analogies for the Social Organization of Hohokam Canal Irrigation. *American Antiquity* 70(3):433–456.

Jackman, Karolyn, Shereen Lerner, Bruce G. Phillips, Margaret Glass, Deborah Ferguson, John Rapp, Karl Reinhard, and Barbara S. Macnider

1999 *From the Outhouse to the Outfield: The Archaeology of Bank One Ballpark.* Cultural Resources Report No. 108. Archaeological Consulting Services, Ltd., Tempe.

Jensen, Karoly Jackman, Holly S. DeMaagd, and Lourdes Aguila

1998 *An Archaeological and Documentary Survey of the Historic Utah Ditch, Maricopa County, Arizona.* Cultural Resource Report No. 104. Archaeological Consulting Services, Ltd., Tempe.

Johnson, Alfred E., and William W. Wasley

1966 Archaeological Excavations near Bylas, Arizona. *Kiva* 31:205–253.

Jones, Daniel W.

1960 *Forty Years Among the Indians.* Westernlore Press, Los Angeles.

Jones, J. Knox, Jr., and Richard W. Manning

1992 *Illustrated Key to the Skulls of North American Land Mammals*. Texas Tech University Press, Lubbock.

Jones, Thomas, and Andrea Gregory

2017 *A Historic Building Inventory of Piestewa Peak Park, Phoenix, Maricopa County, Arizona.* City of Phoenix Project Number PA75300202-1. Archaeological Consulting Services, Ltd., Tempe.

Judd, Neil M.

1931 Arizona's Prehistoric Canals from the Air. In *Explorations and Fieldwork of the Smithsonian Institution in 1930*, pp. 157–166. Smithsonian Institution, Washington, D.C.

Kelley, J. Charles

1966 Mesoamerica and the Southwestern United States. In *Archaeological Frontiers and External Connections*, edited by Gordon Willey and Gordon Ekholm, pp. 95–111. *Handbook of Middle American Indians*, Vol. 4. University of Texas Press, Austin.

Kelley, M. A., and C. S. Larsen (eds.)

1991 *Advances in Dental Anthropology*. Wiley-Liss, New York.

Kelly, Robert L.

1988 The Three Sides of a Biface. *American Antiquity* 53:717–734.

Kelly, Robert L., and David Hurst Thomas

2011 *Archaeology: Down to Earth*. Wadsworth, Cengage Learning, Belmont.

Keur, Mitch A.

2023 *Report of Remains from Data Recovery Efforts at AZ T:12:220(ASM).* WestLand Engineering & Environmental Services, Tucson.

Kwiatkowski, Scott (ed.)

1994 *The Pueblo Grande Project, Vol. 5: Environment and Subsistence.* Publications in Archaeology No. 20. Soil Systems, Inc., Phoenix.

Large, Elinor, Antonio Curet, Mac McDonald, and Debra Franciosi

1994 Ceramic Analysis. In *Excavations along the Pima Freeway from the Salt River to Via Linda*, compiled by K. Adams, A. T. Black, and M. Green, pp. 121–180. Cultural Resources Report No. 78. Archaeological Consulting Services, Ltd., Tempe.

Lawrence, Barbara

1951 *Post-cranial Skeletal Characters of Deer, Pronghorn, and Sheep-goat, with Notes on Bos and Bison.* Reports of the Awatovi Expedition. Report No. 4. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. 35, No. 3.

Layton, Thomas N.

1979 Archaeology of the Rose Spring Site, INY-372. *University of California Publications in American Archaeology and Ethnology* 49(3):237–336.

Library of Congress

2023 *Periodical: The Negro Motorist Green-book.* Electronic document at: https://www.loc.gov/item/2016298176/. Accessed October 19, 2023.

Lindeman, Michael W. (ed.)

2015 *Excavations at La Villa: Continuity and Change at an Agricultural Village.* Technical Report No. 2012-08. Desert Archaeology, Inc., Tucson.

2016 *Building a Village: Excavations at La Villa.* Technical Report No. 2014-07, Desert Archaeology, Inc., Tucson. Anthropological Paper No. 22, Pueblo Grande Museum, Phoenix.

2019a *An Archaeological Historic Properties Treatment Plan for the Edison-Eastlake Community Project, Phoenix, Maricopa County, Arizona.* Technical Report No. 2019-01. Desert Archaeology, Tucson.

2019b *The Edison-Eastlake Community Project, Preliminary Results of Phased Data Recovery at 1825 E. Roosevelt Street, Phoenix, Maricopa County, Arizona.* Report 2019-14. Desert Archaeology, Tucson.

2021a *The Edison-Eastlake Community Project, Preliminary Results of Phased Data Recovery at Area 1 of Harmony at the Park, Phoenix, Maricopa County, Arizona.* Report 2021-03. Desert Archaeology, Tucson.

2021b *The Edison-Eastlake Community Project, Preliminary Results of Phased Data Recovery at Area 2 of Harmony at the Park, Phoenix, Maricopa County, Arizona.* Report 2021-10. Desert Archaeology, Tucson.

2021c *The Edison-Eastlake Community Project, Preliminary Results of Phased Data Recovery at Area 3 of Harmony at the Park, Phoenix, Maricopa County, Arizona.* Report 2021-12. Desert Archaeology, Tucson.

Lindly, John M.

2005 *A Historical Archaeology Treatment Plan for the City of Phoenix Community Noise Reduction Program, Early Historic Settlement of the City of Phoenix: Euro-American, African-American and Hispanic Culture and Tradition in the Valley of the Sun.* Job No. 8566-019. SWCA, Phoenix.

Lindsey, Bill

2024a Bottle/Glass Colors. Electronic document at: http://www.sha.org/bottle/colors.htm. Accessed May 13, 2024.

2024b Bottle Finishes (aka “Lips”) & Closures. Electronic document at: http://www.sha.org/bottle/finishes.htm. Accessed May 13, 2024.

2024c Food Bottles & Canning Jars. Electronic document at: http://www.sha.org/bottle/food.htm. Accessed May 13, 2024.

2024d Soda & Mineral Water Bottles. Electronic document at: http://www.sha.org/bottle/soda.htm. Accessed May 13, 2024.

2024e Beer & Ale Bottles. Electronic document at: https://sha.org/bottle/beer.htm. Accessed May 13, 2024.

2024f Bottle Typing (Typology) & Diagnostic Shapes. Electronic document at: https://sha.org/bottle/typing.htm. Accessed May 13, 2024.

2024g Bottle & Glass Makers Markings. Electronic document at: http://www.sha.org/bottle/makersmarks.htm. Accessed May 13, 2024.

Living New Deal

2024a South Mountain Park: CCC Camps – Phoenix AZ. Electronic document at: https://livingnewdeal.org/sites/south-mountain-park-ccc-camps-phoenix-az/. Accessed January 2024.

2024b Phoenix Sites. Electronic document at: https://livingnewdeal.org/us/az/phoenix-az/. Accessed January 2024.

Lockhart, Bill

2007 The Origins and Life of the Export Beer Bottle. *Bottles and Extras* 18(2):49–58.

Lockhart, Bill, Pete Schulz, David Whitten, Bill Lindsey, and Carol Serr

2010 The Dating Game: The Owens Bottle Co. *Bottles and Extras* 21(1), January–February No. 187, pp. 50–62.

Loendorf, Chris R.

2012 *The Hohokam-Akimel O’Odham Continuum: Sociocultural Dynamics and Projectile Point Design in the Phoenix Basin, Arizona*. Gila River Indian Community, Cultural Resource Management Program, Sacaton.

2014 Historic Period Akimel O’Odham Projectile Points and Settlement Patterns. *Kiva* 79(1):83–103.

2019 1,000 Years a Commodity: Obsidian Procurement and Use within the Phoenix Basin of Southern Arizona. *Journal of Arizona Archaeology* 7(1):69–80.

Loendorf, Chris R., and Barnaby V. Lewis

2017 Ancestral O'Odham: Akimel O'Odham Cultural Traditions and the Archaeological Record. *American Antiquity* 82(1):123–139.

2023 Preface: *Vapaki* of the Ancestors. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. xv–xvi. University of Utah Press, Salt Lake City.

Loendorf, Chris, and Glen E. Rice

2004 *Projectile Point Typology: Gila River Indian Community, Arizona.* Research Papers in Anthropology Number 2. Cultural Resource Management Program, Gila River Indian Community, Sacaton.

Loendorf, Chris R., Craig M. Fertelmes, and Barnaby V. Lewis

2013 Hohokam to Akimel O'Odham: Obsidian Acquisition at the Historic Period Sacate Site (GR-909), Gila River Indian Community, Arizona. *American Antiquity* 78:266–284.

Loendorf, Chris, R. Scott Plumlee, and Shari Tiedens

2017 Projectile Point Design: Flaked-stone Projectile Tip Selection, Function, and Style. *Journal of Arizona Archaeology* 4(2):83–98.

Loendorf, Chris, Craig M. Fertelmes, Shari Tiedens, and J. Andrew Darling

2011 *A Class I Overview and Supplemental Cultural Resource Survey of the E2 Alternative Alignment with Observations on the E1 (Pecos Alignment), South Mountain Transportation Corridor Project, Gila River Indian Community, Maricopa County, Arizona*. Technical Report 2011-05. HDR Inc., Tucson.

Lorentzen, Leon H.

1998 Common Paleoindian and Archaic Projectile Points of Arizona. In *Paleoindian and Archaic Sites in Arizona*, edited by Jonathan B. Mabry. Center for Desert Archaeology, Tucson.

Luckingham, Bradford

1981 Urban Development in Arizona: The Rise of Phoenix. *The Journal of Arizona History* 22(2):197–234.

2016 *Phoenix: The History of a Southwestern Metropolis*. University of Arizona Press, Tucson.

Lykes, Aimee de Potter

1993 A Hundred Years of Phoenix History. In *Phoenix in the Twentieth Century*, edited by G. W. Johnson, Jr., pp. 220–236. University of Oklahoma Press, Norman.

Lyons, Patrick D., J. Brett Hill, and Jeffery J. Clark

2011 Irrigation Communities and Communities in Diaspora. In *Movement, Connectivity, and Landscape Change in the Ancient Southwest*, edited by Margaret C. Nelson and Colleen Strawhacker, pp. 375–401. University Press of Colorado, Boulder.

Mabry, Jonathan B.

1998a *Paleoindian and Archaic Sites in Arizona.* Technical Report No. 97-7. Center for Desert Archaeology, Tucson.

1998b Introduction. In *Archaeological Investigations of Early Village Sites in the Middle Santa Cruz Valley: Analyses and Synthesis, Part I*, edited by Jonathan B. Mabry, pp. 1–29. Anthropological Papers No. 19. Center for Desert Archaeology, Tucson.

2000 The Red Mountain Phase and the Origins of Hohokam Villages. In *The Hohokam Village Revisited*, edited by David E. Doyel, Suzanne K. Fish, and Paul R. Fish, pp. 37–63. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Ft. Collins.

Mabry, Jonathan B. (ed.)

2008 *Las Capas: Early Irrigation and Sedentism in a Southwestern Floodplain*. Anthropological Papers No. 28. Center for Desert Archaeology, Tucson.

Mabry, Jonathan B., and Gavin H. Archer

1997 The Santa Cruz Bend Site, AZ AA:12:746(ASM). In *Archaeological Investigations of Early Village Sites in the Middle Santa Cruz Valley*, by Jonathan B. Mabry, Deborah L. Swartz, Helga Wöcherl, Jeffery J. Clark, Gavin H. Archer, and Michael Lindeman, pp. 9–228. Anthropological Papers No. 18. Center for Desert Archaeology, Tucson.

Mabry, Jonathan B., and Michael K. Faught

1998 Archaic Complexes of the Early Holocene. In *Paleoindian and Archaic Sites in Arizona*, edited by Jonathan B. Mabry, pp. 53–64. Report No. 97-7. Center for Desert Archaeology, Tucson.

Mabry, Jonathan B., and Michelle N. Stevens

2000 The Archaeology of Archaic Hunter-gatherers and Early Farmers in Southeastern Arizona. In *The Archaeology of a Land Between: Regional Dynamics in the Prehistory and History of Southeastern Arizona*, edited by Henry D. Wallace. The Amerind Foundation, Dragoon.

Mabry, Jonathan B., Deborah L. Swartz, Helga Wöcherl, Jeffery J. Clark, Gavin H. Archer, and Michael W. Lindeman

1997 *Archaeological Investigations of Early Village Sites in the Middle Santa Cruz Valley: Descriptions of the Santa Cruz Bend, Square Hearth, Stone Pipe, and Canal Sites*. Anthropological Papers No. 18. Center for Desert Archaeology, Tucson.

Madsen, David B.

1999 *North Asian-North American Connections: The Smithsonian Workshop.* Paper presented at the Clovis and Beyond Conference, October 28. Santa Fe.

Majewski, Teresita, and Michael J. O'Brien

1987 The Use and Misuse of Nineteenth-century English and American Ceramics in Archaeological Analysis. In *Advances in Archaeological Method and Theory*, Vol. 11, edited by Michael B. Schiffer, pp. 97–209. Academic Press, San Diego.

Manson, Joni L., and David M. Snyder

1996 Evaluating Sites with Late Nineteenth or Early Twentieth Century Components for Eligibility in the National Register of Historic Places: Using Turn-of-the-century Whitewares as Economic Indicators in Assessing Collection and Developing Contexts. Electronic document at: http://ncptt.nps.gov/wp-conent/uploads/1996-10.pdf. Accessed November 8, 2012.

Maricopa County Air Quality Department

2008 Maricopa County Dust Control Policy. Electronic document at: http://www.maricopa.gov/aq/divisions/compliance/dust/docs/pdf/Dust_Control_Brochure.pdf.

Marshall, John T.

2001 Ballcourt. In *The Grewe Archaeological Research Project, Vol. 1: Project Background and Feature Descriptions*, edited by Douglas B. Craig, pp. 109–124. Anthropological Papers No. 99-1. Northland Research, Inc., Tempe.

Martinelli, Phylis Cancilla

1993 The Transformation of an Ethnic Community: Phoenix's Italians, 1880 to 1980. In *Phoenix in the 20th Century: Essays in Community History,* edited by G. Wesley Jonson, Jr., pp. 69–79. University of Oklahoma Press, Norman.

Masse, W. Bruce

1980 The Hohokam of the Lower San Pedro Valley and the Northern Papagueria: Continuity and Variability in Two Regional Populations. In *Current Issues in Hohokam Prehistory*, edited by David Doyel and Fred Plog, pp. 205–223. Anthropology Papers No. 23. Arizona State University, Tempe.

1981 A Reappraisal of the Protohistoric Sobaipuri Indians of Southeastern Arizona. In *The Protohistoric Period in the North American Southwest, A.D. 1450–1700*, edited by David R. Wilcox, pp. 28–56. Anthropological Research Papers No. 24. Arizona State University, Tempe.

1988 Archaeological Sediments of the Hohokam Expressway Canals. In *The 1982–1984 Excavations at Las Colinas: The Site and its Features*, edited by David A. Gregory, William L. Deaver, Suzanne K. Fish, Ronald Gardiner, Robert W. Layhe, Fred L. Nials, Lynn S. Teague, and W. Bruce Masse, pp. 333–369. Archaeological Series 162, Vol. 2. Cultural Resource Management Division, Arizona State Museum, University of Arizona, Tucson.

1991 The Quest for Subsistence: Sufficiency and Civilization in the Sonoran Desert. In *Chaco and Hohokam: Prehistoric Regional Systems in the American Southwest*, edited by Patricia L. Crown and W. James Judge, pp. 195–223. School of American Research Press, Santa Fe.

Mathien, Frances Joan, and Randall H. McGuire (eds.)

1986 *Ripples in the Chichimec Sea: New Considerations of Southwestern-Mesoamerican Interactions*. Southern Illinois University Press, Carbondale.

McCauley, Kevin R.

1993 Public Transportation and Streets in Phoenix, 1950–1980. In *Phoenix in the 20th Century: Essays in Community History,* by G. Wesley Jonson, Jr., pp. 197–213. University of Oklahoma Press, Norman.

McDermott, Matt, and Christopher E. Rayle

2004 *Archaeological Monitoring Report for ADOT Irrigation Line and Landscaping Improvements within the State Route 143 Right-of-way between Van Buren and Washington Streets, Phoenix, Maricopa County, Arizona.* Archaeological Monitoring Report No. 00-469:103. EcoPlan Associates, Inc., Mesa.

McGuire, Randall H., and Ann V. Howard

1987 The Structure and Organization of Hohokam Shell Exchange. *Kiva* 52:113–146.

McKusick, Charmion R.

1986 *Southwest Indian Turkeys: Prehistory and Comparative Osteology*. Southwest Bird Laboratory, Globe.

Midvale, Frank

1968 Prehistoric Irrigation in the Salt River Valley. *The Kiva* 34:28–32.

Miller, George L.

1980 Classification and Economic Scaling of 19th Century Ceramics. *Historical Archaeology* 14:1–40.

1991 A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787–1880. *Historical Archaeology* 25:1–25.

Mitchell, Douglas R. (ed.)

1989 *Archaeological Investigations at the Grand Canal Ruins: A Classic Period Site in Phoenix, Arizona.* Publications in Archaeology No. 12. Soil Systems, Inc., Phoenix.

1990 *The La Lomita Excavations: 10th Century Hohokam Occupation in South-central Arizona.* Publications in Archaeology No. 15. Soil Systems, Inc., Phoenix.

1994a *The Pueblo Grande Project, Vol. 2: Feature Descriptions, Chronology, and Site Structure.* Publications in Archaeology No. 20. Soil Systems, Inc., Phoenix.

1994b *The Pueblo Grande Project, Vol. 7: An Analysis of Classic Period Hohokam Mortuary Practices.* Publications in Archaeology No. 20. Soil Systems, Inc., Phoenix.

Mitchell, Douglas R., and Judy L. Brunson-Hadley

2001 An Evaluation of Classic Period Hohokam Burials and Society: Chiefs, Priests, or Acephalous Complexity? In *Ancient Burial Practices in the American Southwest: Archaeology, Physical Anthropology, and Native American Perspectives*, edited by Douglas R. Mitchell and Judy L. Brunson-Hadley, pp. 45–67. University of New Mexico Press, Albuquerque.

Mitchell, Douglas R., and Laurene G. Montero (eds.)

2023 *The 1997–2007 Sun America Excavations at the Hohokam Village of S'eḏav Va'aki, Vol. I: Introduction, Feature Summaries, Chronology, and Mortuary Studies.* Occasional Papers Number 11. S'eḏav Va'aki Museum, Phoenix.

Mitchell, Douglas R., Laurene G. Montero, Todd W. Bostwick, and Lindsey Vogel-Teeter (eds.)

2020 *Archaeology of the Pueblo Grande Platform Mound and Surrounding Features, Vol. 5: Special Studies.* Anthropological Papers No. 1. Pueblo Grande Museum, Phoenix.

Mitchell, Douglas R., Laurene G. Montero, Zachary Rothwell, Stephanie Sherwood, and Steven Rascona

2022 Map It! The Pueblo Grande Village Mapping Project. *The SAA Archaeological Record* 22(4):18–24.

Montero, Laurene G., and Todd W. Bostwick

2019 Ceramic Evidence for Prehistoric Long Distance Interaction: Non-local Ceramics from AZ U:9:1(ASM) (Pueblo Grande). *Journal of Arizona Archaeology* 7(1):1–25.

Montero, Laurene G., and Mark R. Hackbarth

1992 *Archaeological Testing at the Jefferson Street Parking Garage, Block 39, City of Phoenix.* Northland Research, Inc., Tempe.

Morgan, Linda, Barnaby V. Lewis, and Chris Loendorf

2023 Akimel O'Odham Traditional Knowledge Regarding Platform Mounds. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 73–82. University of Utah Press, Salt Lake City.

Morris, Donald H.

1969 Red Mountain: An Early Pioneer Period Hohokam Site in the Salt River Valley of Central Arizona. *American Antiquity* 34(1):40–53.

Motsinger, Thomas N.

1993 The Dutch Canal Ruin Ceramic Assemblage. In *Early Desert Farming and Irrigation Settlements: Archaeological Investigations in the Phoenix Sky Harbor Center, Vol. 2: Dutch Canal Ruin*, edited and compiled by D. H. Greenwald, M. Zyniecki, and D. M. Greenwald, pp. 207–227. Archaeological Report No. 93-17. SWCA Environmental Consultants, Flagstaff.

Motsinger, Thomas N., and Mary-Ellen Walsh-Anduze

1994 *Socioeconomic Mutualism and Ceramic Production in the Gila Butte-Snaketown Region, Southern Arizona.* Paper presented at the 59th Annual Meeting of the Society for American Archaeology, Anaheim.

Murrell, Monica L., and Phillip H. Shelley

2009 Geoarchaeology of a Late Prehistoric Water Storage Feature at Pueblo Oso Negro, Chupadera Basin, New Mexico. *Kiva* 75(1):11–33.

National Geographic

n.d. *Field Guide to the Birds of North America*. National Geographic, Washington, D.C.

National Park Service

1983 Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. *Federal Register*, Vol. 48, No. 190.

1991 *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. U.S. Department of the Interior, National Park Service, Washington, D.C.

Neily, Robert B.

1985 *The Snowflake-Redonda Project: An Intensive Archaeological Survey in the Upper Little Colorado River Area of East-central Arizona*. Cultural Resource Management Division, Arizona State Museum, University of Arizona, Tucson.

Neily, Robert B., and James W. Cogswell

2007 *A Cultural Resources Treatment Plan for Data Recovery at Pozos de Sonoqui, AZ U:14:49(ASM), along the Planned Riggs Road Alignment, Queen Creek, Maricopa County, Arizona*. Technical Report No. 055262c. Logan Simpson Design, Inc., Tempe.

Nelson, Ben A., Paul R. Fish, and Suzanne K. Fish

2017 Mesoamerican Connections. In *The Oxford Handbook of Southwest Archaeology*, edited by Barbara J. Mills and Severin Fowles, pp. 461–479. Oxford University Press, Oxford.

Nelson, Margaret C.

1991 The Study of Technological Organization. In *Archaeological Method and Theory*, Vol. 3, edited by Michael B. Schiffer, pp. 57–100. University of Arizona Press, Tucson.

Nelson, Megan Kate

2020 *The Three-cornered War: The Union, the Confederacy, and Native Peoples in the Fight for the West.* Scribner, New York.

Nelson, Richard S.

1986 Pochtecas and Prestige: Mesoamerican Artifacts in Hohokam Sites. In *Ripples in the Chichimec Sea: New Considerations of Southwestern-Mesoamerican Interactions*, edited by Frances Joan Mathien and Randall H. McGuire, pp. 154–182. Southern Illinois University Press, Carbondale.

Newman, T. Stell

1970 A Dating Key for Post-eighteenth Century Bottles. *Historical Archaeology* 4(1):70–75.

Nicholas, Linda M., and Jill Neitzel

1984 Canal Irrigation and Sociopolitical Organization in the Lower Salt River Valley: A Diachronic Analysis. In *Prehistoric Agricultural Strategies in the Southwest*, edited by Suzanne K. Fish and Paul R. Fish, pp. 161–178. Anthropological Research Papers No. 33. Arizona State University, Tempe.

North, Chris D., Michael S. Foster, John M. Lindly, and Douglas R. Mitchell

2005 A Newly Discovered Clovis Point from the Phoenix Basin and an Update on Arizona Clovis Point Attributes. *Kiva* 70(3):293–307.

Olsen, Stanley J.

1968 The Osteology of the Wild Turkey. In *Fish, Amphibian and Reptile Remains from Archaeological Sites*, pp. 107–137. Papers of the Peabody Museum of Archaeology and Ethnology, Vol. 56, No. 2. Cambridge.

Parker, Dorothy R.

1996 *Phoenix Indian School: The Second Half-century*. University of Arizona Press, Tucson.

Parry, William J., and Robert L. Kelly

1987 Expedient Core Technology and Sedentism. In *The Organization of Core Technology*, edited by Jay K. Johnson and Carol A. Morrow, pp. 285–304. Westview Press, Boulder.

Pearsall, Deborah M.

1982 Phytolith Analysis: Applications of a New Paleoethnobotanical Technique in Archeology. *American Anthropologist* 84(4):862–871.

Peters, Matthew D., and Emily Elizabeth Meyer

2021 *The Las Cremaciones Phase I Testing Project: Investigations in the Southwest Portion of Las Cremaciones, AZ T:12:220(ASM), Phoenix, Maricopa County, Arizona.* Cultural Resources Report No. 030505. North Wind Resource Consulting, Phoenix.

Phillips, Bruce G., Gregory E. Berg, Lourdes Aguila, and Barbara S. Macnider

2001 *Data Recovery at AZ U:5:33(ASM) within the Pima Freeway Corridor, Phoenix, Maricopa County, Arizona.* Cultural Resources Report No. 116. Archaeological Consulting Services, Ltd., Tempe.

Phoenix, City of (COP)

2015 *Phoenix Deer Valley Airport Master Plan Update*. Electronic document at: https://apps.azdot.gov/files/Airports/MP_PDF/Phx_Deer_Valley/DVT_MasterPlan.pdf. Accessed January 22, 2024.

2020a *City of Phoenix Guidelines for Archaeology*. Revised edition. City of Phoenix Parks and Recreation Department, Phoenix.

2020b *Pueblo Grande Museum Archaeological Repository Guidelines*. City of Phoenix Parks and Recreation Department, Phoenix.

Phoenix Deer Valley Airport

2024 *The Little Airport That Could.* Electronic document at: https://www.deervalleyairport.com/about-dvt-airport/history. Accessed January 19, 2024.

Poff, N. LeRoy, J. David Allan, Mark B. Bain, James R. Karr, Karen L. Presegaard, Brian D. Richter, Richard E. Sparks, and Julie C. Stromberg

1997 The Natural Flow Regime. *BioScience* 47(11):769–784.

Rathje, William L., and R. Richard Wilk

1982 Household Archaeology. *American Behavioral Scientist* 25(6):617–638.

Ravesloot, John C., and Stephanie M. Whittlesey

1987 Inferring the Protohistoric Period in Southern Arizona. In *The Archaeology of the San Xavier Bridge Site (AZ BB:13:14), Tucson Basin, Southern Arizona*, edited by John C. Ravesloot, pp. 81–98. Archaeological Series No. 171. Arizona State Museum, University of Arizona, Tucson.

Rayle, Greta, and Mary-Ellen Walsh

2012 Research Design for the Prehistoric Component. In *The CityScape Project: Archaeological Investigations of Pueblo Patricio and Block 22 of the Original Phoenix Townsite, Phoenix, Maricopa County, Arizona*, edited by Mark R. Hackbarth, pp. 13–23. Technical Report in Prehistory No. 6, Logan Simpson, Tempe. Anthropological Papers No. 18, Pueblo Grande Museum, Phoenix.

Rice, Glen E.

1987 *A Spatial Analysis of the Hohokam Community of La Ciudad.* Anthropological Field Studies 16. Arizona State University, Tempe.

2001 *The Role of Field Houses and Farmsteads in Hohokam Settlement Systems*. P-MIP Report No. 2001-10. Cultural Resource Management Program, Gila River Indian Community, Sacaton.

Rice, Glen E. (ed.)

1987 *The Hohokam Community of La Ciudad.* OCRM Report No. 69. Arizona State University, Tempe.

Rice, Glen E., and John L. Czarzasty (eds.)

2008 *Las Cremaciones: A Hohokam Ball Court Center in the Phoenix Basin.* Rio Salado Archaeology. Occasional Papers No. 6. Pueblo Grande Museum, Phoenix.

Rice, Glen E., and Chris Loendorf

2023 Unfinished Work at Platform Mounds. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 237–247. University of Utah Press, Salt Lake City.

Rice, Glen E., John L. Czarzasty, Christopher N. Watkins, and Erik Steinbach

2009 Findings of the Las Canopas Data Recovery Project. In *Excavations at Las Canopas: A Hohokam Village in the Phoenix Basin*, edited by John L. Czarzasty and Glen E. Rice, pp. 325–348. Anthropological Papers No. 17. Pueblo Grande Museum, Phoenix.

Rice, Glen E., Arleyn W. Simon, Chris Loendorf, Carla R. Van West, and Jeffrey S. Dean

2023 Platform Mounds of the Sonoran Desert. In *Vapaki: Ancestral O'Odham Platform Mounds of the Sonoran Desert*, edited by Glen E. Rice, Arleyn W. Simon, and Chris Loendorf, pp. 3–25. University of Utah Press, Salt Lake City.

Rock, Jim

1987 *A Brief Commentary on Cans*. Cultural Resource Management, Yreka, California.

Rogge, A. E. (ed.)

2011 *Excavations within the State Route 101L/64th Street Locus of the Last Ditch Site, AZ U:5:33 (ASM), Phoenix, Arizona.* Cultural Resources Report Number 2008-18(AZ). URS Corporation, Phoenix.

Rogge, A. E. (Gene), and J. Joel White

2003 *Central Phoenix/East Valley Light Rail Transit Project: Results of Archaeological Testing at the Proposed Maintenance and Storage Facility.* URS Corporation, Phoenix.

Roth, Barbara J.

1992 Sedentary Agriculturalists of Mobile Hunter-gatherers? Evidence on the Late Archaic Occupation of the Northern Tucson Basin. *Kiva* 57:291–314.

Roth, Barbara J., and Richard V. N. Ahlstrom

2000 Synthesis and Conclusions. In *Farming through the Ages: 3,400 Years of Agriculture at the Valley Farms Site in the Northern Tucson Basin*, edited by Kevin D. Wellman, pp. 305–317. Cultural Resources Report No. 98-226. SWCA, Inc., Environmental Consultants, Tucson.

Roth, Barbara J., and Bruce B. Huckell

1992 Cortaro Points and the Archaic of Southern Arizona. *Kiva* 57(4):353–370.

Russell, Frank

1908 *The Pima Indians*. Twenty-sixth Annual Report of the Bureau of American Ethnology, 1904–1905. Smithsonian Institution, Washington, D.C.

Ryan, Kimberly A.

2008 *Archaeological Monitoring Report for the SRP Grand Canal Lining Project between 40th Street and State Route 143 in Phoenix, Maricopa County, Arizona*. Cultural Resource Monitoring Report No. 06-958:05. EcoPlan Associates, Inc., Mesa.

Sayles, E. B., and Ernst Antevs

1941 *The Cochise Culture*. Medallion Papers No. 29. Gila Pueblo, Globe.

Schaafsma, Polly

1980 *Indian Rock Art of the Southwest*. University of New Mexico Press, Albuquerque.

Schiffer, Michael B.

1982 Hohokam Chronology: An Essay on History and Method. In *Hohokam and Patayan: Prehistory of Southwestern Arizona*, edited by Randall H. McGuire and Michael B. Schiffer, pp. 299–344. Academic Press, New York.

1986 Radiocarbon Dates and the “Old Wood” Problem: The Case of the Hohokam Chronology. *Journal of Archaeological Science* 13:13–30.

Schilling, Linda M., Scott Solliday, Victoria D. Vargas, and Thomas Jones

2010 *Cultural Resource Survey of 797 Acres for the Goodyear Airport Improvements Project, Goodyear, Maricopa County, Arizona.* Archaeological Consulting Services, Ltd., Tempe.

Schilz, Allan J., Margerie Green, Lourdes Aguila, and Glennda Gene Luhnow

2011 *Tracks through Time: Urban Archaeology along the METRO Light Rail Corridor.* Report No. 147. Archaeological Consulting Services, Ltd., Tempe.

Schroeder, Albert H.

1965 Unregulated Diffusion from Mexico into the Southwest Prior to A.D. 700. *American Antiquity* 30(3):297–309.

1966 Pattern Diffusion from Mexico into the Southwest after A.D. 600. *American Antiquity* 31(5):683–704.

Schroeder, Kelly J.

1995 *Archaeological Investigations of the Yunya Park Locus at Las Moradas in Phoenix, Arizona.* Roadrunner Archaeology and Consulting, Phoenix.

Schwartz, Christopher, Ryan Arp, and Steve Swanson

2023 *End of Fieldwork Report for Phase II Data Recovery at AZ T:12:220(ASM) in Phoenix, Arizona.* Cultural Resource Services Technical Paper No. 2022-36. Environmental Planning Group, Phoenix.

Serocki, Robert A., Jr., and Todd W. Bostwick

2002 *Archaeological Monitoring Projects at Pueblo Grande Museum and Archaeological Park 2000–2001.* Pueblo Grande Museum Technical Report No. 01-05. Phoenix.

Seymour, Deni J.

1988 An Alternative View of Sedentary Period Hohokam Shell Ornament Production. *American Antiquity* 53:812–829.

1990 *A Methodological Perspective on the Use and Organization of Space: A Case Study of Hohokam Structures from Snaketown, Arizona*. Unpublished Ph.D. dissertation. Department of Anthropology, University of Arizona, Tucson.

Seymour, Gregory R., Richard V. N. Ahlstrom, and David P. Doak

1997 *The Sanchez Copper Project, Vol. 1: Archaeological Investigations in the Safford Valley, Graham County, Arizona*. Archaeological Report No. 94-82. SWCA, Inc., Environmental Consultants, Tucson.

Shackley, M. Steven

1996 Range and Mobility in the Hunter-gatherer Southwest. In *Early Formative Adaptations in the Southern Southwest*, edited by Barbara J. Roth, pp. 5–16. World Archaeology 25. Prehistory Press, Madison.

Shackley, M. Steven, and David R. Tucker

2001 Limited Prehistoric Procurement of Sand Tank Obsidian. *Kiva* 66:345–374.

Shaul, David Leedom, and John M. Andresen

1989 A Case for Yuman Participation in the Hohokam Regional System. *Kiva* 54(2):105–122.

Shaul, David Leedom, and Jane H. Hill

1998 Tepimans, Yumans, and Other Hohokam. *Kiva* 63(3):375–396.

Shott, Michael

1986 Technological Organization and Settlement Mobility: An Ethnographic Examination. *Journal of Anthropological Research* 42:15–51.

Sires, Earl W., Jr.

1984 Excavations at El Polvorón (AZ U:15:59). In *Hohokam Archaeology along the Salt-Gila Aqueduct, Central Arizona Project: Prehistoric Occupation of the Queen Creek Delta*, edited by Lynn S. Teague and Patricia L. Crown, pp. 221–326. Archaeological Series No. 150, Vol. 4. Arizona State Museum, University of Arizona, Tucson.

1987 Hohokam Architectural Variability and Site Structure during the Sedentary-Classic Transition. In *The Hohokam Village: Site Structure and Organization*, edited by David E. Doyel, pp. 171–182. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Glenwood Springs.

Slaughter, Mark C.

1992 Flaked Stone in Arizona. In *Making and Using Stone Artifacts: A Context for Evaluating Lithic Sites in Arizona*, by Mark C. Slaughter, Lee Fratt, Kirk Anderson, and Richard V. N. Ahlstrom, pp. 4–15. Prepared by SWCA, Inc., Environmental Consultants, Tucson.

Sliva, R. J.

1997 *An Introduction to the Study and Analysis of Flaked Stone Artifacts and Lithic Technology.* Center for Desert Archaeology, Tucson.

Smiley, Francis E.

1998a Wood and Radiocarbon Dating: Interpretive Frameworks and Techniques. In *Archaeological Chronometry: Radiocarbon and Tree-ring Models and Applications from Black Mesa, Arizona,* edited by Francis E. Smiley and Richard V. N. Ahlstrom, pp. 25–48. Center for Archaeological Investigations Occasional Paper No. 16. Southern Illinois University, Carbondale.

1998b Old Wood: Assessing Age Overestimation. In *Archaeological Chronometry: Radiocarbon and Tree-ring Models and Applications from Black Mesa, Arizona,* edited by Francis E. Smiley and Richard V. N. Ahlstrom, pp. 49–64. Center for Archaeological Investigations Occasional Paper No. 16. Southern Illinois University, Carbondale.

Sorrell, Daniel H.

2008 *Archaeological Investigations in Support of the Phoenix Bioscience Center Project: Data Recovery at AZ T:12:70(ASM), Phoenix, Maricopa County, Arizona.* Cultural Resources Project 05-864:2. EcoPlan Associates, Mesa.

South, Stanley

1977 *Method and Theory in Historical Archaeology*. Academic Press, New York.

Spicer, Edward H.

1997 *Cycles of Conquest*. University of Arizona Press, Tucson.

Sprague, Roderick

1981 Functional Classification for Artifacts from 19th and 20th Century Historical Sites. *North American Archaeologist* 2(3):251–261.

Steeley, James, and Dennis Gilpin

n.d. *Lifeline to the Desert: Water Utilization and Technology in Arizona's Historic Era, 1540–1960*. SWCA Environmental Consultants, Phoenix.

Stevens, Michelle N., and R. Jane Sliva

2002 Empire Points: An Addition to the San Pedro Phase Lithic Assemblage. *Kiva* 67:297–326.

Sticha, Sarah

2013 *Addendum to Results of Phase II Data Recovery Excavations within Block 58 and Phase II Archaeological Monitoring within Blocks 58 and 70 of the Original Phoenix Townsite, Phoenix, Maricopa County, Arizona.* Technical Report No. 125010g. Logan Simpson Design, Inc., Tempe.

Stinson, Susan L.

2005 Rembering the Ancestors: Ceramic Figurines from Las Capas and Los Pozos. In *Material Cultures and Lifeways of Early Agricultural Communities in Southern Arizona*, edited by R. Jane Sliva, pp. 207–216. Anthropological Papers No. 35. Center for Desert Archaeology, Tucson.

Stone, Lyle M.

1981 *Archaeological Test Excavations, Blocks 1 and 2 of the Original Phoenix Townsite.* Archaeological Research Services, Tempe.

Stone, Tammy

1993 Small Site Function and Duration of Occupation in the Hohokam Northern Periphery. *Kiva* 59:65–82.

Stubing, Michael

2009 *Archaeological Monitoring of the 44th Street, Washington Street to McDowell Road Landscape Project, Phoenix, Maricopa County, Arizona*. Project Report No. 2009-001. Jacobs Engineering Group, Tucson.

Stubing, Michael, and Saskia Grupp

2005 *Results of Phase I Data Recovery, a Phase II Data Recovery Work Plan, and a Monitoring and Discovery Plan for AZ U:9:67(ASM)/La Lomita, within the City of Phoenix, Maricopa County, Arizona.* Project Report No. 2005-027. Carter-Burgess, Phoenix.

Stubing, Michael, and Douglas R. Mitchell

1997 *Results of Additional Archaeological Data Recovery and Monitoring at La Lomita (AZ U:9:67[ASM]), Phoenix, Arizona.* Archaeological Report No. 97-29. SWCA, Inc., Phoenix.

Sullivan, Michael, and Carol Griffith

2021 *Down in the Dumps: Context Statement and Guidance on Historical-period Waste Management and Refuse Deposits.* SHPO Advisory Committee on Historical Archaeology. Arizona State Historic Preservation Office, Phoenix.

Teague, Lynn S.

1993 Prehistory and the Traditions of the O'Odham and Hopi. *Kiva* 58(4):435–454.

2009 Prehistory and the Traditions of the O'Odham and Hopi. *Kiva* 75(2): 239-259.

Teague, Lynn S., and William L. Deaver (eds.)

1989 *The 1982–1984 Excavations at Las Colinas: Syntheses and Conclusions.* Archaeological Series 162, Vol. 6. Arizona State Museum, Tucson.

Toulouse, Julian H.

1971 *Bottle Makers and their Marks*. Thomas Nelson, New York.

Trennert, Robert A.

1993 Phoenix and the Indians: 1867–1930. In *Phoenix in the 20th Century: Essays in Community History*, edited by G. Wesley Jonson, Jr., pp. 53–68. University of Oklahoma Press, Norman.

Turner, Korri, and Michael J. Stubing

2005 *Cultural Resource Monitoring of Ground Disturbing Activities Associated with Construction of a Storage Facility at Pueblo Grande Museum, Phoenix, Maricopa County, Arizona.* Project Report No. 2004-21. Carter & Burgess, Phoenix.

Turney, Omar A.

1924 *The Land of the Stone Hoe*. Phoenix.

1929 Prehistoric Irrigation. *Arizona Historical Review* 2(3):1–162.

Vandermeer, Phillip

2012 *Desert Visions & the Making of Phoenix, 1860–2009.* University of New Mexico Press, Albuquerque.

Van Gerven, Dennis P., and Susan Guise Sheridan (eds.)

1994 *The Pueblo Grande Project, Vol. 6: The Bioethnography of a Classic Period Hohokam Population.* Publications in Archaeology No. 20. Soil Systems, Inc., Phoenix.

Van Zinderen Bakker, E. M.

1995 Archaeology and Palynology. *The South African Archaeological Bulletin* 50(162):98–105.

Vargas, Victoria D.

1995 *Copper Bell Trade Patterns in the Prehispanic U.S. Southwest and Northwest Mexico.* Archaeological Series 187. Arizona State Museum, University of Arizona, Tucson.

Vint, James M.

2017 *Time and Place of the Early Agricultural Period in the Tucson Basin of Southern Arizona.* Unpublished Ph.D. dissertation. University of Arizona, Tucson.

2018 The Southwestern Archaic in the Tucson Basin. In *The Archaic Southwest: Foragers in an Arid Land*, edited by Bradley J. Vierra, pp. 66–97. University of Utah Press, Salt Lake City.

Wallace, Henry D.

1995 *Archaeological Investigations at Los Morteros, a Prehistoric Settlement in the Northern Tucson Basin*. Anthropological Papers No. 17. Center for Desert Archaeology, Tucson.

1997 Presence or Parlance? The Meaning of "Hohokam" and Concepts of Culture, A.D. 800 to 1050, in Southeastern Arizona. In *The Archaeology of a Land Between: Regional Dynamics in the Prehistory and History of Southeastern Arizona*, edited by Henry D. Wallace. Amerind Foundation, Dragoon, and University of New Mexico Press, Albuquerque.

2001 Time Seriation and Typological Refinement of the Middle Gila Buff Ware Sequence: Snaketown through Soho Phase. In *The Grewe Archaeological Research Project, Vol. 2: Material Culture, Part I: Ceramic Studies*, edited by David R. Abbott, pp. 177–261. Northland Research, Inc., Tempe.

2004 Chapter 3: Update to the Middle Gila Buff Ware Ceramic Sequence. In *Hohokam Farming on the Salt River Floodplain: Refining Models and Analytical Methods*, edited by T. Kathleen Henderson, pp. 45–124. Anthropological Papers No. 10. Center for Desert Archaeology, Tucson.

Wallace, Henry D., James M. Heidke, and William H. Doelle

1995 Hohokam Origins. *Kiva* 60(4):575–618.

Wallace, Henry D., Michael W. Lindeman, M. Kyle Woodson, Chris R. Loendorf, and Barnaby V. Lewis

2020 Patterning in Pre-Classic Hohokam Village Structure: Implications for Cultural Resource Management. *Journal of Arizona Archaeology* 7(2):125–156.

Walsh, Mary-Ellen

2009 *Results of Archaeological Monitoring for a Salt River Project Pole Replacement Project Located South of Washington Street between 48th Street and 40th Street, Phoenix, Maricopa County, Arizona.* Technical Report 085367. Logan Simpson Design, Tempe.

Walsh-Anduze, Mary-Ellen

1993a An Evaluation of Ceramic Production at the Gila Butte Site. In *Archaeological Investigations at the Gila Butte Site: Hohokam Irrigation and Economic Systems along the Gila River, Arizona*, prepared by Thomas N. Motsinger, pp. 22–35. Report No. 93-84. SWCA Environmental Consultants, Tucson.

1993b The Sourcing of Hohokam Red-on-buff Ceramics Using Inductively Coupled Plasma Spectroscopy: "Schist Happens." Unpublished Master's thesis. Department of Anthropology, Northern Arizona University, Flagstaff.

Ward, Albert E., Emily K. Abbink, and John R. Stein

1977 Ethnohistorical and Chronological Basis of the Navajo Culture. In *Settlement and Subsistence along the Lower Chaco River: The GCP Survey*, edited by Charles A. Reher, pp. 217–278. University of New Mexico Press, Albuquerque.

Waters, M. R.

1986 *The Geoarchaeology of Whitewater Draw, Arizona*. Anthropological Papers No. 45. University of Arizona Press, Tucson.

Watkins, Christopher N., Glen E. Rice, and Erik Steinbach

2011 Dating Hohokam Canals: A Methodological Case Study. *Journal of Arizona Archaeology* 1(2): 162–168.

Weaver, Donald E., Jr.

1972 A Cultural-ecological Model for the Classic Hohokam Period in the Lower Salt River Valley. *Kiva* 38:43–52.

Weed, Carol S.

1972 The Beardsley Canal Site. *The Kiva* 38(2):57–94.

Wegener, Robert M., and Richard Ciolek-Torrello (eds.)

2011 *The U.S. 60 Archaeological Project: Early Agricultural, Formative, and Historical Period Use of the Upper Queen Creek Region, Vol. 2: Excavation of Prehistoric Sites in the Queen Valley to Queen Creek Area.* Technical Series 92. Statistical Research, Inc., Tucson.

Wegener, Robert M., and John D. Hall (eds.)

2017 *The Luke Air Force Base Solar Project – 5,000 Years of Aboriginal Land Use in the Western Phoenix Basin: Analyses and Interpretations*. Technical Series 95, Vol. 2. Statistical Research, Inc., Tucson.

Wegener, Robert M., Michael P. Heilen, Richard Ciolek-Torrello, and John D. Hall (eds.)

2011 *The U.S. 60 Archaeological Project: Early Agricultural, Formative, and Historical-period use of the Upper Queen Creek Region: Analyses of Prehistoric Materials in the Queen Valley to Queen Creek Area.* Technical Series 92, Vol. 4. Statistical Research, Inc., Tucson.

Wells, E. Christian

2006 *From Hohokam to O'Odham: The Protohistoric Occupation of the Middle Gila River Valley, Central Arizona*. Anthropological Research Papers Number 3. Gila River Indian Community, Cultural Resource Management Program, Sacaton.

Whalen, Norman M.

1971 *Cochise Culture Sites in the Central San Pedro Valley, Arizona*. Unpublished Ph.D. dissertation. Department of Anthropology, University of Arizona, Tucson.

1975 Cochise Site Distribution in the San Pedro Valley. *The Kiva* 40:203–211.

Wheeler, Alwyne, and Andrew K. G. Jones

1989 *Fishes*. Cambridge Manuals in Archaeology. Cambridge University Press, Cambridge, United Kingdom.

White, William A., Ashley M. Morton, Janet L. Griffitts, and Kerry L. Sagebiel

2010 Artifact Types Found in the Joint Courts Complex Postcemetery Component. In *Deathways and Lifeways in the American Southwest: Tucson's Historic Alameda-Stone Cemetery and the Transformation of a Remote Outpost into an Urban City*, Vol. 3, edited by Marlesa A. Gray and Karen K. Swope, pp. 39–56.

Whitten, David

2024 Glass Bottle Marks. Electronic document at: http://www.glassbottlemarks.com/. Accessed May 13, 2024.

Whittlesey, Stephanie M.

2015 Deconstructing the Early Agricultural Period in Southern Arizona. In *Late Holocene Research on Foragers and Farmers in the Desert West*, edited by B. J. Roth and M. E. McBrinn, pp. 78–107. University of Utah Press, Salt Lake City.

Whittlesey, Stephanie M., S. Jerome Hesse, and Michael S. Foster (eds.)

2007 *Recurrent Sedentism and the Making of Place: Archaeological Investigations at Las Capas, a Preceramic Period Farming Community in the Tucson Basin, Southern Arizona*. Cultural Resources Report No. 07-556. SWCA, Inc., Environmental Consultants, Tucson.

Whittlesey, Stephanie M., Barbara K. Montgomery, and Robert A. Heckman

1998 Ceramic Overview and Analytic Methods. In *Vanishing River: Landscapes and Lives of the Lower Verde Valley: The Lower Verde Archaeological Project, Vol. 3: Material Culture and Physical Anthropology*, edited by Stephanie M. Whittlesey and Barbara K. Montgomery, pp. 1–28. CD-ROM. SRI Press, Tucson.

Wilcox, David R.

1979 The Hohokam Regional System. In *An Archaeological Test of Sites in the Gila Butte-Santan Region, South-central Arizona*, edited by Glen E. Rice, David Wilcox, Kevin Rafferty, and James Schoenwetter, pp. 77–116. Anthropological Research Papers No. 18. Arizona State University, Tempe.

1987 *Frank Midvale's Investigation of the Site of La Ciudad.* Anthropological Field Studies 19. Arizona State University, Tempe.

1991a Hohokam Social Complexity. In *Chaco and Hohokam: Prehistoric Regional Systems in the American Southwest*, edited by Patricia L. Crown and W. James Judge, pp. 253–275. School of American Research Press, Santa Fe.

1991b The Mesoamerican Ballgame in the American Southwest. In *The Mesoamerican Ballgame*, edited by Vernon L. Scarborough and David R. Wilcox, pp. 101–125. University of Arizona Press, Tucson.

Wilcox, David R., and Jerry B. Howard

1990 La Ciudad de los Hornos: A History of Research. In *One Hundred Years of Archaeology at La Ciudad de los Hornos*, edited by David R. Wilcox, Jerry B. Howard, and Rueben H. Nelson, pp. 21–72. Publications in Archaeology No. 16. Soil Systems, Inc., Phoenix.

Wilcox, David R., and Lynette O. Shenk

1977 *The Architecture of the Casa Grande and its Interpretation*. Archaeological Series No. 115. Arizona State Museum, University of Arizona, Tucson.

Wilcox, David R., and Charles Sternberg

1983 *Hohokam Ballcourts and their Interpretation*. Arizona State Museum Archaeological Series 160. Arizona State Museum, University of Arizona, Tucson.

Wilcox, David R., Thomas McGuire, and Charles Sternberg

1981 *Snaketown Revisited: A Partial Cultural Resource Survey, Analysis of Site Structure and an Ethnohistoric Study of the Proposed Hohokam-Pima National Monument*. Archaeological Series No. 155. Arizona State Museum, University of Arizona, Tucson.

Winter, Marcus C.

1976 The Archeological Household Cluster in the Valley of Oaxaca. In *The Early Mesoamerican Village*, edited by Kent V. Flannery, pp. 25–31. Academic Press, New York.

Woodbury, Richard B.

1960 The Hohokam Canals at Pueblo Grande, Arizona. *American Antiquity* 26(2):267–270.

Woodson, M. Kyle

2016 The Archaeological Excavation and Explanation of Ancient Canal Irrigation Systems in Southern Arizona, USA. In *Irrigation and Early States: New Directions*, edited by Stephanie Rost. University of Chicago, Oriental Institute, Chicago (in press).

2002 *Archaeological Investigations at the Sweetwater Site on the Gila River Indian Community*. Cultural Resources Report No. 2002-14. Cultural Resource Management Program, Gila River Indian Community, Sacaton.

2022 The Archaeological Excavation and Explanation of Ancient Canal Irrigation Systems in Southern Arizona, USA. In *Irrigation and Early States: New Directions*, edited by Stephanie Rost, pp. 83–112. University of Chicago, Oriental Institute, Chicago.

Wright, Aaron M.

2014 *Religion on the Rocks: Hohokam Rock Art, Ritual Practice, and Social Transformation.* University of Utah Press, Salt Lake City.

Wright, Thomas E.

2002 *Archaeological Testing of AZ U:1:25(ASM), the Brown's Ranch Rock Shelter Site, in Northern Scottsdale, Maricopa County, Arizona.* The Arizona Archaeologist No. 33. Arizona Archaeological Society, Phoenix.

Yukihara, Eduardo G., and Stephen W. S. McKeever

2011 *Optically Stimulated Luminescence: Fundamentals and Applications*. John Wiley & Sons, Ltd., Chichester, West Sussex, United Kingdom.

Zumwalt, Betty

1980 *Ketchup, Pickles, Sauces: 19th Century Food in Glass.* Mark West Publishers, Fulton.

Zyniecki, M., and Kathleen S. McQuestion

1995 Pueblo Salado, Area 14. In *Early Desert Farming and Irrigation Settlements: Archaeological Investigations in the Phoenix Sky Harbor Center, Vol. 3: Pueblo Salado*, edited by David H. Greenwald, Mark L. Chenault, and Dawn M. Greenwald, pp. 121–159. Anthropological Research Paper Number 4. SWCA, Inc., Environmental Consultants, Flagstaff and Tucson.

APPENDIX A
General Historic Properties Treatment Plan Addendum Form

City Archaeology Office
S'eḏav Va'aki Museum
4619 E. Washington St.
Phoenix, AZ 85034

GENERAL HISTORIC PROPERTIES TREATMENT PLAN ADDENDUM FORM

Email completed form to: archaeology@phoenix.gov

This form should be accompanied by a map of the project area boundary on a U.S. Geological Survey (USGS) topographic quadrangle background and a map of previously conducted survey projects and previously recorded archaeological sites in the project review area. Additional maps or graphics should be added as applicable.

City Archaeology Office use only

Approved by: ____________________

Date: ____________________

Section 1. Consultant Information

Consultant: ____________________

Date: ____________________

Principal Investigator: ____________________

Project Manager: ____________________

Field Director: ____________________

Address: ____________________

City, state, zip code: ____________________

Contact name: ____________________

Contact phone: ____________________

Contact email: ____________________

Section 2. Project Information

Project Name: ____________________

Consultant Project No.: ____________________

SVM Project No. ____________________

COP Department (if applicable): ____________________

COP Cost Center No. (if applicable): ____________________

Project Sponsor: ____________________

Project Funding Source: ____________________

Applicable Regulations: ____________________

Required Permitting: ____________________

Required Consultation: ____________________

Affected Sites or Resources: ____________________

Repository: ____________________

City Archaeology Office
S'e̱dav Va'aki Museum
4619 E. Washington St.
Phoenix, AZ 85034

City of Phoenix

Section 3. Project Location

Landowner: ______________________

USGS Quad: ______________________

Legal Description: ______________________

UTM Identifier(s): ______________________

APN(s): ______________________

Total Acreage: ______________________

Section 4. Project Description

Describe the proposed project/undertaking including information on the types and extent of planned ground disturbance:

Section 5. Previous Research

Describe previous research conducted for the affected site(s), including survey, testing, data recovery, and any monitoring projects with findings:

Section 6. Research Design

Identify specific applicable research themes, questions, and data requirements appropriate to the location and resources affected by the project, including any deviations from or amendments to the previously presented research designs in the HPTP:

Section 7. Approach to Archival and Historical Research

If applicable, identify specific sources to be included in this research:

Section 8. Site-Specific Work Plan(s)

Identify the site-specific work plan(s) including methods for demolition monitoring, surface collection, percentage of subsurface testing, trenching plan, sampling protocols for feature excavation, post-data recovery burial monitoring, and/or any deviations from the standard work plan provided in the HPTP:

Section 9. Safety

Describe the safety plan to address fieldwork, transportation, and public safety issues:

Section 10. Plan of Action for No Findings or Insignificant Findings

Describe the action to be taken should there be no findings or should findings be deemed insignificant in consultation with the City Archaeologist:

Section 11. Plan of Action for Significant Findings

Describe the action to be taken in the event findings are significant. This should include a plan for the transition between testing (boundary testing or Phase I data recovery) and data recovery. The transition may include written CAO approval of an excavation plan, an in-field meeting or virtual meeting, or formal Section 106 and/or State Historic Preservation Act consultation (if applicable):

Section 12. Schedule for Project Updates

At a minimum, updates to the CAO should occur weekly during fieldwork and quarterly during analysis and reporting.

Section 13. Project Deliverables

Describe the requirements and anticipated schedule for project deliverables, including End of Field report(s), draft report, and final report as applicable:

Section 14. Consultant Signature

Signed: ____________________ Printed Name: ____________________

Position: ____________________ Date: ____________________

APPENDIX B
Media Policy for Disturbance to Ancestral Human Remains

Media Policy for Disturbance to Ancestral Human Remains

The Phoenix Metropolitan Area is a cultural landscape that contains buried archaeological resources that represent thousands of years of occupation. Native American communities such as the Gila River Indian Community and the Salt River Pima-Maricopa Indian Community claim cultural affiliation with the prehistoric cultures who inhabited these archaeological sites. The Hopi Tribe and the Pueblo of Zuni claim associations with the cultural resources of the Phoenix area. Human remains are frequently encountered during construction and other ground-disturbing activities within the city of Phoenix.

Arizona Revised Statutes (A.R.S.) § 41-844 and § 41-865 and their implementing regulations require that the treatment and recovery of human remains be done in a respectful and sensitive manner. Native American communities in Arizona have stated that the public should not be allowed to view human remains during their recovery and that photographs or video film are strictly prohibited. These respectful practices should be applied to any encountered human remains regardless of affiliation.

If the news media or curious bystanders appear at an archaeological site where human remains are being recovered, they should be referred to the City of Phoenix Archaeology Office. They should not be informed that human remains have been encountered.

In order to ensure that the human remains are not observed by anyone other than the archaeologists who are working at the site and by City or State officials, the area around the human remains must be secured with a fence, and cloth should be placed on the fence to prevent the public from viewing their recovery. Only unbleached muslin may be placed on human remains.

According to the Arizona Public Records Act (A.R.S. § 39-125), the City of Phoenix can refuse to provide information to the public about the location of encountered human remains and other sensitive cultural resources in order to protect them from vandalism.

All human remains encountered within the city of Phoenix should be reported to the City of Phoenix Archaeology Office (602-495-0901) and the Arizona State Museum Repatriation Office. For more information about A.R.S. § 41-844 and A.R.S. § 41-865, contact the Arizona State Museum Repatriation Coordinator (520-626-0320). For more information about City of Phoenix projects, contact the City of Phoenix Public Information Office (602-262-7176).

S'edav Va'aki

Museum