CITY OF TEMPE
HISTORIC PRESERVATION COMMISSION

Meeting Date: 04/19/2023
Agenda Item: 6

Memorandum

To: Historic Preservation Commission

From: Zachary J. Lechner, Historic Preservation Officer (ex. 8870, zachary_lechner@tempe.gov)

Date: April 12, 2023

Subject: Agenda Item #6, COT Historic Properties Treatment Plan and Cultural Resource Inventory

Logan Simpson has completed a Historic Properties Treatment Plan (HPTP) and Cultural Resource Inventory (CRI) for the City of Tempe. It has undergone review by the Tempe Historic Preservation Office, the Gila River Indian Community Tribal Historic Preservation Office (GRIC THPO), and the Salt River Pima-Maricopa Indian Community Tribal Historic Preservation Office (SRPMIC THPO). Additional consultation with other stakeholders will follow shortly.

As detailed in the document:

"The purpose of this CRI and plan is to provide background information about archaeological resources and [Traditional Cultural Properties] TCPs within the city and provide guidelines for implementing archaeological projects within the Tempe city limits. It is intended to help facilitate the consultation process, promote consistency in the treatment of archaeological resources in Tempe, and obviate the need for full-length treatment plans for each individual ground-disturbing project or undertaking. In lieu of full-length treatment plans, future archaeological projects within Tempe will be required to provide addenda to this plan that address project-specific information and Class I background information that postdate this document. . . .

"This document presents a citywide cultural resources inventory (CRI) and general historic properties treatment plan (Plan) for land within the COT. It is intended to assist the COT and other stakeholders with managing archaeological resources within the city limits in compliance with all applicable municipal, state, and federal laws. This document includes the following:

- A comprehensive cultural resource inventory (CRI) focused on archaeological resources, including archaeological sites, known and projected prehistoric canals, and historical structures within the city limits.
- An assessment and overview of Traditional Cultural Properties (TCPs) within the city limits derived through coordination with appropriate ancestral communities.
- A general plan based on the information compiled from the CRI and TCP assessment that provides measures to mitigate, minimize, or avoid adverse effects to archaeological resources and TCPs resulting from ground-disturbing activities.

"This Plan does *not* address historic preservation of standing historic buildings, structures, districts, or other extant elements of the historic built environment, although it does address treatment of subsurface archaeological remains associated with those properties."

This critical document includes appendices containing information related to sensitive cultural resources. At the request of GRIC THPO and SRPMIC THPO, and per standards in the field of cultural resource management, these appendices shall be redacted from the HPTP and CRI when the document is disseminated to non-cultural resource professionals. As a result, the attached version provided to the Historic Preservation Commission (and thus made available to the public) does not include the appendices. The HPO will email the full, unredacted version of the HPTP and CRI to cultural resource professionals on the Commission.

At the April HPC meeting, Logan Simpson's Andrea Gregory will present and receive the Commission's feedback on the HPTP and CRI.

ATTACHMENT:

1. City of Tempe Historic Property Treatment Plan and Cultural Resource Inventory (appendices redacted)

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

Prepared for:

City of Tempe
Historic Preservation Office
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LOGAN SIMPSON

March 2023
Submittal 2

Logan Simpson Technical Report No. 195530a

ABSTRACT

Report Title:	General Historic Properties Treatment Plan for the City of Tempe, Maricopa County, Arizona
Report Date:	March 16, 2023 (Submittal 2)
Lead Agency	City of Tempe (COT)
Other Agencies Involved	Arizona State Museum (ASM), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), Federal Aviation Administration (FAA), Federal Communications Commission (FCC), Federal Highways Administration (FHWA), Federal Transportation Agency (FTA), Maricopa Association of Governments (MAG), Maricopa County Department of Transportation (MCDOT), Flood Control District of Maricopa County (FCDMC), Salt River Project (SRP), Valley Metro Regional Public Transportation Authority (Valley Metro), Fort McDowell Yavapai Nation, Fort Mohave Indian Tribe, Gila River Indian Community, Hopi Tribe, Pascua Yaqui Tribe, Pueblo of Zuni, Salt River Pima-Maricopa Indian Community, Tohono O'Odham Nation, Tonto Apache Tribe, White Mountain Apache Tribe, Yavapai Prescott Indian Tribe, Yavapai-Apache Nation
Applicable Historic Preservation Regulations	All ground-disturbing actions within the city limits are subject to compliance with the COT Historic Preservation Ordinance (TCC Chapter 14A), as well as Arizona's legal statutes for the protection of cultural resources and human remains on state, municipal, and county land (A.R.S. §41-841 *et seq*.) or on private land (A.R.S. §41-865). Actions that involve municipal, county, or state land or funding will trigger compliance with the Arizona Antiquities Act (Arizona Revised Statutes [A.R.S.] §41-841 *et seq*.). Actions that involve state land or funding also will trigger compliance with Arizona State Historic Preservation Act (A.R.S. §41-861 *et seq*.). Actions that involve federal land, funding, or permitting will trigger compliance with 36 CFR Part 800 (as revised in 2004), the regulations implementing Section 106 of the National Historic Preservation Act (54 U.S. Code [USC] §306108; "Section 106"). Actions that occur on federally owned land within the city limits also will trigger compliance with the Archaeological Resources Protection Act (16 USC §470aa-470mm) and the Native American Graves Protection and Repatriation Act (25 USC §3001-3013).
Land Ownership	n/a
Logan Simpson Project No.	195530

Project Description

This document presents a citywide cultural resources inventory (CRI) and general historic properties treatment plan (Plan) for land within the COT. It is intended to assist the COT and other stakeholders with managing archaeological resources within the city limits in compliance with all applicable municipal, state, and federal laws. This document includes the following:

- A comprehensive cultural resource inventory (CRI) focused on archaeological resources, including archaeological sites, known and projected prehistoric canals, and historical structures within the city limits.
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- A general plan based on the information compiled from the CRI and TCP assessment that provides measures to mitigate, minimize, or avoid adverse effects to archaeological resources and TCPs resulting from ground-disturbing activities.

This Plan does *not* address historic preservation of standing historic buildings, structures, districts, or other extant elements of the historic built environment, although it does address treatment of subsurface archaeological remains associated with those properties.

Project Location

COT

Type of Investigation

Archaeological monitoring; Arizona Register of Historic Places- and National Register of Historic Places-eligibility testing; Phase I archaeological excavation (data testing); Phase II archaeological excavation (data recovery); site boundary extent and identification testing; Class I and Class III cultural resource inventories, including pedestrian surveys; in-use historical structure documentation, TCP identification.

Repository

Any collections and records resulting from projects subject to an AAA permit must be curated with an ASM-approved repository, which includes the Tempe History Museum.

Comments

The purpose of this CRI and plan is to provide background information about archaeological resources and TCPs within the city and provide guidelines for implementing archaeological projects within the Tempe city limits. It is intended to help facilitate the consultation process, promote consistency in the treatment of archaeological resources in Tempe, and obviate the need for full-length treatment plans for each individual ground-disturbing project or undertaking. In lieu of full-length treatment plans, future archaeological projects within Tempe will be required to provide addenda to this plan that address project-specific information and Class I background information that postdate this document.

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INTRODUCTION

This document presents a citywide cultural resources inventory (CRI) and general archaeological monitoring, discovery, and treatment plan (plan) for the City of Tempe (COT), Maricopa County, Arizona (Figure 1). It is intended to assist the COT and other stakeholders with managing archaeological resources within the city limits in compliance with all applicable municipal, state, or federal laws. This document includes the following:

- A comprehensive CRI focused on archaeological resources, including archaeological sites, known and projected prehistoric canals, and historical structures within the city limits.
- An assessment and overview of Traditional Cultural Properties (TCPs) within the city limits derived through coordination with appropriate ancestral communities.
- A general plan based on the information compiled from the CRI and TCP assessment that provides measures to mitigate, minimize, or avoid adverse effects to archaeological resources and TCPs resulting from ground-disturbing activities.

The work completed under this document will provide information for the COT to make informed management decisions about current and future ground-disturbing projects within the city limits and on COT-owned properties outside the city limits. The document provides methods and procedures for the implementation of archaeological monitoring, eligibility testing, identification testing, Phase I archaeological excavation (data testing), Phase II archaeological excavation (data recovery), Class I and Class III cultural resource inventories, and in-use historical structure documentation. It also provides guidelines for the treatment of inadvertent archaeological discoveries and encounters of human remains. The archaeological methods and investigative 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 put forth by the Arizona State Historic Preservation Office (SHPO) and Arizona State Museum (ASM). This document does not address historic preservation of standing historical buildings, structures, districts, or other standing elements of the historic built environment, although it does address the treatment of subsurface archaeological remains affiliated with those properties.

The methods and procedures outlined in this document provide broad guidelines for implementing archaeological projects. In lieu of full-length treatment plans, after obtaining permission from the Tempe Historic Preservation Officer (HPO) to use this plan, archaeological consultants (contractor) pursuing archaeological projects in Tempe will be required to provide addendum plans to this document that address project-specific information (key components of the addendum plans are discussed in a later section). The research design, field and laboratory methods, and other procedures and guidelines set forth in this document will guide the addendum plans. All addendum plans will reference this document and explain any amendments, changes, or exclusions to the general methods and procedures outlined herein, along with an updated Class I inventory. Accordingly, this document will help the COT and other project proponents facilitate the consultation process, promote consistency in the treatment of archaeological resources in Tempe, and obviate the need to prepare full-length archaeological treatment plans for each individual ground-disturbing project or undertaking.

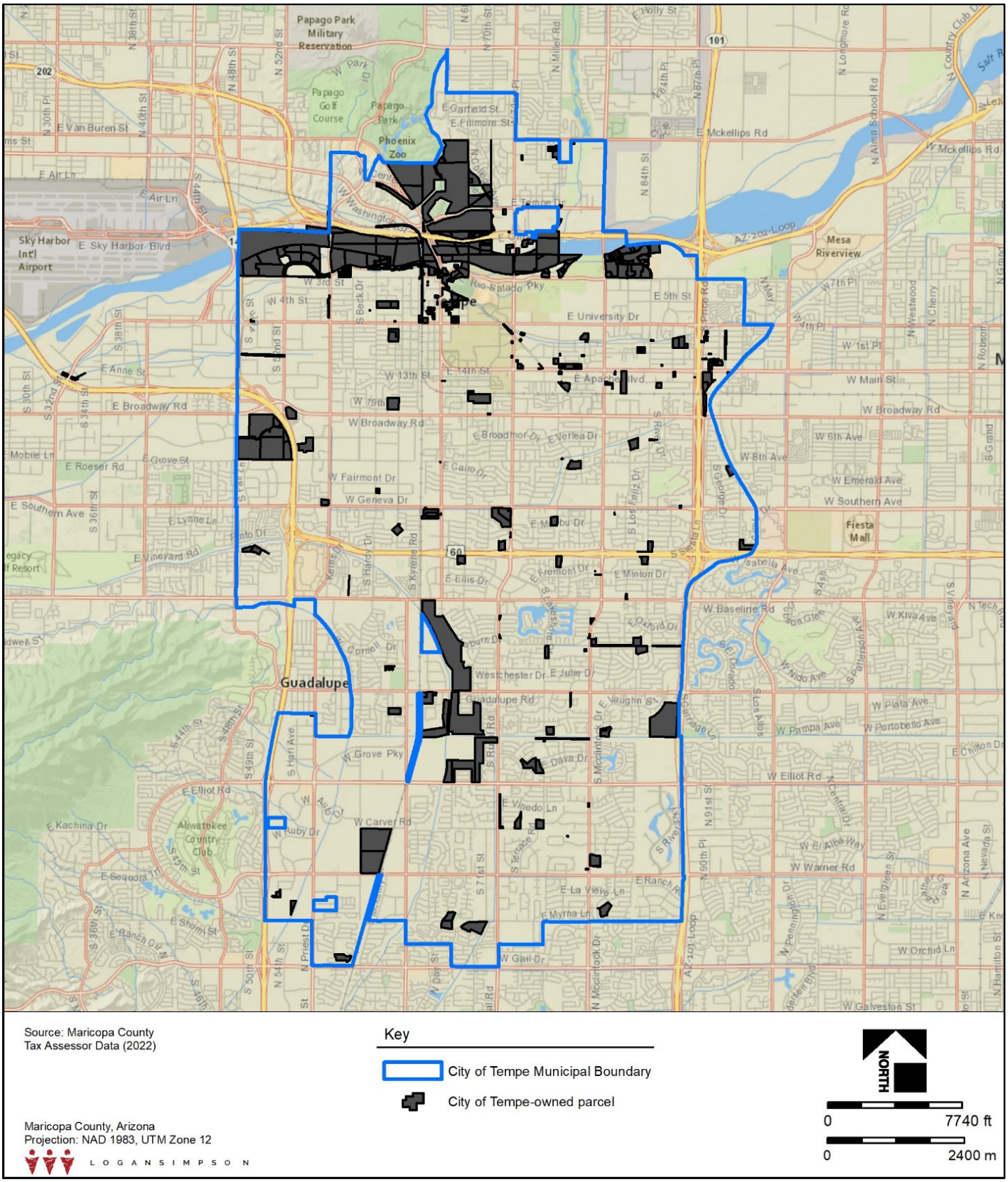

Figure 1. Map showing the Tempe city limits and COT-owned land parcels, not including roadways.

The COT formally invited 33 parties for consultation on this plan, which are listed in Table 1. The federal and state government agencies invited for consultation include those with known landholdings in Tempe or that frequently provide funding or permitting for projects within the city limits. The Native American Tribes (Tribes) invited for consultation derive from the Government-to-Government Consultation Toolkit (G2G Toolkit; available at sites.google.com/view/az-consultation-toolkit/home, accessed August 3, 2021) developed through a collaboration between the SHPO and the Salt River Pima-Maricopa Indian Community (SRPMIC). One non-government organization was invited to consult: the Tempe Historic Preservation Foundation, a nonprofit organization. A neighboring municipality—the Town of Guadalupe—also was invited for consultation, both because of its affiliation with the Pascua Yaqui Tribe and because places of cultural importance for the Guadalupe community are known to be present within the Tempe city limits. Most of the invited parties (22 of 33) agreed to consult; four parties declined to consult, three parties declined to consult but requested a copy of the final plan document, and five parties did not reply to the COT's formal invitation.

This document includes the following components:

- Legal contexts and permitting requirements for projects conducted within Tempe.
- Prehistoric and historic cultural contexts for archaeological resources within the city limits, including discussions of previous archaeological investigations, previously recorded archaeological sites and canals, and historical records.
- A discussion of TCPs.
- A research design outlining prehistoric and historical research themes, including research questions that will guide cultural resource investigations.
- A general overview of methods employed to identify, evaluate, and mitigate effects to archaeological resources, as well as protocols for the respectful treatment of encountered human remains and animal funerary features.
- General guidelines for investigating a range of prehistoric and historical archaeological feature types anticipated to be present in Tempe.
- General guidelines for analysis of artifacts and botanical samples.
- Technical reporting and curation standards.

LEGAL CONTEXTS AND PERMITTING

The COT is a Certified Local Government (CLG) committed to the preservation of historical resources within its jurisdiction—including archaeological sites, the historic built environment, and other heritage resources—in coordination with the Arizona SHPO and the National Park Service (NPS). In accordance with its CLG status, the COT established a city historic preservation ordinance (Tempe City Code [TCC] Chapter 14A) to "provide protection for significant properties and archeological sites which represent important aspects of Tempe's heritage; to enhance the character of the community by taking such properties and sites into account during development, and to assist owners in the preservation and restoration of their properties." TCC Chapter 14A also established the HPO, the Tempe Historic Preservation Commission (HPC), and the Tempe Historic Property Register (THPR). The HPO is responsible for ensuring that effects to historical resources, including archaeological sites and TCPs, are properly and effectively evaluated and mitigated prior to completing any pertinent actions (e.g., ground-disturbing construction within archaeological sites,

Table 1. List of agencies, Native American Tribes, and other parties invited for consultation on this plan.

Invited Party	Organization Type	Consultation status
Ak-Chin Indian Community	Native American Tribe	Agreed to consult
Arizona Department of Transportation	State agency	Agreed to consult
Arizona Department of Water Resources	State agency	Declined to consult
Arizona State Land Department	State agency	No reply
Arizona State Museum	State agency	Agreed to consult
Arizona State University	State agency	Agreed to consult
Bureau of Land Management, Arizona Office	Federal agency	Agreed to consult
Bureau of Land Management, Lower Sonoran Field Office	Federal agency	Agreed to consult
Bureau of Reclamation, Phoenix Area Office	Federal agency	Agreed to consult
Federal Aviation Administration	Federal agency	Declined to consult, requested final document
Federal Communications Commission	Federal agency	Declined to consult, requested final document
Federal Highways Administration	Federal agency	Declined to consult
Federal Transportation Agency	Federal agency	Declined to consult
Fort McDowell Yavapai Nation	Native American Tribe	No reply
Fort Mohave Indian Tribe	Tribal community	No reply
Gila River Indian Community	Native American Tribe	Agreed to consult
Hopi Tribe	Native American Tribe	Agreed to consult
Maricopa Association of Governments	County agency	Agreed to consult
Maricopa County Department of Transportation	County agency	Agreed to consult
Flood Control District of Maricopa County	County agency	Declined to consult, requested final document
Pascua Yaqui Tribe	Native American Tribe	Agreed to consult
Pueblo of Zuni	Native American Tribe	Agreed to consult
Salt River Pima-Maricopa Indian Community	Native American Tribe	Agreed to consult
Salt River Project	Quasi-public agency	Agreed to consult
State Historic Preservation Office	State agency	Agreed to consult
Tempe Historic Preservation Foundation	Nonprofit organization	Agreed to consult
Tohono O'Odham Nation	Native American Tribe	Agreed to consult
Tonto Apache Tribe	Tribal community	No reply
Town of Guadalupe	Municipality	Agreed to consult
Valley Metro Regional Public Transportation Authority	Public agency	Agreed to consult
White Mountain Apache Tribe	Native American Tribe	Declined to consult
Yavapai Prescott Indian Tribe	Native American Tribe	Agreed to consult
Yavapai-Apache Nation	Tribal community	No reply

modifications of historic properties) within the city limits or on COT-owned properties outside the city limits. If impacts are anticipated within an archaeological site, for example, the HPO will evaluate the action and determine an appropriate type of mitigation (monitoring, testing, data recovery) based on the location of the action as well as the nature and severity of the of proposed ground disturbance involved with the action.

The HPO also is responsible for the preservation of historic properties within the city limits and COT-owned properties outside the city limits in compliance with any applicable state and federal historic preservation laws. Table 2 summarizes the various municipal, state, and federal laws and the legal nexuses that trigger compliance with each one. All actions within the city limits are subject to compliance with TCC Chapter 14A, as well as applicable state and federal laws. This includes projects completed on private land within the city limits, which also are subject to compliance with Arizona Revised Statutes (A.R.S.) §41-865, Arizona's legal statute that provisions for the protection of human remains and funerary objects encountered on private land.

Table 2. Summary of applicable historic preservation laws and legal nexuses for Tempe projects.[a]

Legal Nexus	TCC Ch. 14A	A.R.S. §41-865	A.R.S. §41-844	AAA	SHPA	NHPA Sec. 106	ARPA	NAGPRA
Land Ownership								
Private (within city limits)	X	X	—	—	—	—	—	—
Municipal	X	—	X	X	—	—	—	—
State	X	—	X	X	X	—	—	—
County	X	—	X	X	—	—	—	—
Federal	X	—	—	—	—	X	X	X
Funding								
Private	X	—	—	—	—	—	—	—
Municipal	X	—	—	—	—	—	—	—
State	X	—	—	—	X	—	—	—
County	X	—	—	—	—	—	—	—
Federal	X	—	—	—	—	X	—	X[b]

[a] Legal abbreviations:

TCC Ch. 14A: Tempe City Code Chapter 14A.

A.R.S. §41-865: Arizona's legal statute for the protection of human remains 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, mortuary 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 Sec. 106: Section 106 of the National Historic Preservation Act, 54 USC §306108.

ARPA: Archaeological Resources Protection Act, 16 USC §70aa-470mm.

NAGPRA: Native American Graves Protection and Repatriation Act, 25 USC §3001-3013.

[b] Although primarily applicable for work on federal and Tribal lands, human remains or cultural items recovered from private or state land may be subject to NAGPRA as a holding or collection. See further discussion below.

Actions that involve federal funding or permitting trigger compliance with 36 CFR Part 800 (as revised in 2004), the regulations implementing Section 106 of the National Historic Preservation Act (NHPA; 54 U.S. Code [USC] §306108), hereafter abbreviated as "Section 106." Compliance with Section 106 requires formal consultation with SHPO, the federal agency (or agencies) involved with the project, and Tribes; if more than

one federal agency is involved, one will be identified as the lead consulting agency. Actions that occur on federally owned land within the city limits also trigger compliance with Section 106 as well as the Archaeological Resources Protection Act (ARPA, 16 USC §470aa-470mm) and the Native American Graves Protection and Repatriation Act (NAGPRA, 25 USC §3001-3013). Federal agencies that own land in Tempe or that regularly provide funding or permits for projects within the city limits include, but are not limited to, the Bureau of Reclamation (BOR), Bureau of Land Management (BLM), Federal Highways Administration (FHWA), Department of Housing and Urban Development (HUD), Federal Communication Commission (FCC), United States Postal Service (USPS), and Federal Transit Administration (FTA). The NHPA, ARPA, and NAGPRA are discussed in more detail below.

Actions that involve lands owned by the state (or by instruments of the state including municipal and county land) trigger compliance with the Arizona Antiquities Act (AAA, A.R.S. §41-841 *et seq*.). In addition to the AAA, any actions that occur on state land or using state funding also must comply with the Arizona State Historic Preservation Act (SHPA; A.R.S. §41-861 *et seq*.), which is administered by the SHPO. SHPO consultation under the SHPA is required regardless of whether the project area overlaps an ASM-listed site. State agencies that manage land within Tempe or that frequently provide cultural resource compliance oversight for projects within the city limits include Arizona State University (ASU under the Arizona Board of Regents), Arizona Department of Transportation (ADOT), and others.

This plan is expected to be used for any COT-sponsored projects and/or projects that occur within COT limits. This plan may be used to guide archaeological investigations that involve a state or federal nexus (i.e., land ownership, permitting, or federal funding), but only with the express consent of the applicable state or federal agency (or agencies). For projects that entail a federal nexus, even if use of this plan is permitted, the federal agency may additionally require that the project be completed in accordance with a federally approved memorandum of agreement (MOA) or programmatic agreement (PA). Permits that may be required for projects conducted within Tempe are discussed below under their associated regulatory contexts.

Section 106 of the National Historic Preservation Act (54 USC §306108)

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included, or has been determined to be eligible for inclusion, in the National Register of Historic Places (NRHP), and consult with affiliated Tribes to determine if there are traditional religious or cultural properties in a project's area of potential effects (APE) that may be adversely affected by the undertaking. To be eligible for inclusion in the NRHP, historic properties must be at least 50 years old and meet one or more of the criteria set forth in 36 CFR 60.4:

- Criterion A: applies to properties that are associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: applies to properties that are associated with the lives of persons significant in our past; or
- Criterion C: applies to properties 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

- Criterion D: applies to properties that have yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting one or more criteria, properties must be significant within the context of prehistory or history, with assessment of the information's importance being a critical factor. The NPS uses the concept of historic context to evaluate importance, which consists of a time (e.g., late Historic period), a place (e.g., Phoenix), and a theme (e.g., community development). To be eligible for listing in the NRHP, a property must not only be significant under the NRHP criteria, but it also must have integrity. Integrity is the ability of a property to convey its significance: why, where, and when a property is important. The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association (National Register of Historic Places 2002:44–45).

Section 106 applies to all federal and federally assisted projects (including projects requiring federal permitting) that have the potential to affect historic properties. The statute provides the SHPO, Advisory Council on Historic Preservation (ACHP), affiliated federally recognized Indian Tribes, other interested parties, and the public the opportunity to review and comment on actions that may impact historic properties in their communities. Pursuant to Section 106 review, the federal agency, in consultation with other participants, determines if an undertaking has the potential to adversely affect historic properties and, if so, must consider measures to avoid, minimize, or mitigate such effects. Once appropriate treatment measures to resolve adverse effects are agreed upon by the consulting parties, they are codified in an agreement document (MOA or PA), which will need to be reviewed, approved, and executed by all consulting parties before the project can begin. In general, MOAs are appropriate for a specific undertaking of defined duration where adverse effects are understood. PAs may be of two types. Project PAs are appropriate for complex undertakings where adverse effects cannot be fully determined in advance. Programmatic PAs are used when the federal agency needs to modify the standard Section 106 review process to facilitate compliance under a particular program with multiple similar or repetitive activities, such as routine maintenance.

Archaeological Resources Protection Act (16 USC 470aa-470mm)

ARPA provides guidance to land-managing federal agencies for improved management and protection of archaeological resources on federal and Indian lands and assigns authority to federal officials to enforce laws that protect archaeological sites on public lands as well as enforce financial and incarceration penalties for persons who are convicted of unpermitted excavation, removal, damage, or defacement of archaeological resources. The statute requires that the federal agency issue an archaeological permit before any survey, excavation, or collection of cultural resources occurs on public lands and establishes requirements for the curation of artifacts and other materials recovered from permitted excavation (36 CFR 79). ARPA also requires that federal managers responsible for the protection of archaeological resources hold information about the location and nature of these resources confidential unless providing the information would further the purpose of the statute and not create a risk of harm for the resources.

ARPA permits are issued by land managing federal agencies for all archaeological investigations conducted by non-agency personnel on federal lands unless carried out under a contract or cooperative agreement for archaeological services with the federal agency. ARPA permits are requested from the federal land-

managing agency, who determines whether a permit is necessary and what types of documentation (e.g., statement of work, key personnel qualifications, budget, curation plan, NAGPRA Plan of Action [POA]) may be required in support of the application (43 CFR 7.6). ARPA permit applications must be submitted at least 60 days in advance of the planned fieldwork, and permits may be issued for up to three years, with multi-year permits reviewed annually. Work conducted under ARPA is subject to compliance with Section 106 of the NHPA and the National Environmental Policy Act (NEPA).

Native American Graves Protection and Repatriation Act (25 USC §3001-3013)

NAGPRA provides for the repatriation and disposition of certain Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony (hereinafter referred to as NAGPRA cultural items) encountered on federal or Tribal lands and establishes procedures to determine the appropriate treatment of funerary features and NAGPRA cultural items that may be encountered during planned excavation or inadvertently as part of an undertaking on federal or Tribal lands. NAGPRA requires that federal agencies consult with affiliated Tribes prior to the intentional excavation or removal of human remains and NAGPRA cultural items from federal or Tribal lands. The statute also requires federal agencies and institutions that receive federal funding to return previously recovered human remains and NAGPRA cultural items to lineal descendants or culturally affiliated Tribes.

Planned excavations conducted under the authority of an ARPA permit generally require preparation of a NAGPRA POA, as well as Tribal consultation to identify known lineal descendants or culturally affiliated Tribes and determine appropriate treatment and disposition of any human remains and NAGPRA cultural items that may be recovered or removed during excavation. In general, a POA will include descriptions of the planned undertaking and the kinds of NAGPRA cultural items that may be encountered during the work, as well as information regarding their planned treatment and disposition as agreed upon through Tribal consultation.

Arizona Antiquities Act (A.R.S. §15-1631 and §41-841 *et seq*.) and A.R.S. §41-865

The ASM administers statutes related to state lands (AAA, A.R.S. §15-1631, and A.R.S. §41-841 *et seq.*) and private lands (A.R.S. §41-865). The statutes codified in A.R.S. §41-841 *et seq.* apply to land directly owned or controlled by the State of Arizona or by any agency, instrumentality, or political subdivision of the State of Arizona, including any county or municipal corporation within the state. A.R.S. §41-865 prohibits the intentional or accidental disturbance of human remains and funerary objects on privately owned lands in Arizona and establishes rules and procedures for consultation and reporting such encounters.

A.R.S. §41-841 *et seq.* prohibits unauthorized excavation or defacing of historical, archaeological, or paleontological sites and the collection or destruction of artifacts on state lands; regulates excavation of prehistoric features on state lands in Arizona through a permit system; and includes a statute that provisions for the protection of cultural resources, including human remains, mortuary objects, sacred ceremonial objects, and objects of national or Tribal patrimony, encountered on state land (including municipal and county land) (A.R.S. §41-844). As defined by ASM (Fish 1995), archaeological sites should contain physical remains of past human activity that are at least 50 years old. Additionally, sites should consist of at least one of the following:

1. 30+ artifacts of a single class (i.e., 30 sherds, 30 lithics, 30 tin cans) within an area 15 meters (50 feet) in diameter, except when all pieces appear to originate from a single source (i.e., one ceramic pot, one core, one glass bottle).
2. 20+ artifacts that include at least 2 classes of artifact types (i.e., sherds, ground stone, nails, glass) within an area 15 meters (50 feet) in diameter.
3. One or more archaeological features in temporal association with any number of artifacts.
4. Two or more temporally associated archaeological features without artifacts.

Blanket AAA permits to conduct non-collection surveys on state lands are issued to archaeological consultants on an annual basis. Projects conducted under a blanket AAA permit are limited to surface observations and do not involve artifact collection, excavation, or other ground disturbance. Each project conducted under a blanket permit requires obtaining an Accession Number from ASM; ASM also requires blanket permit holders to submit a Notice of Intent (NOI) prior to the fieldwork and an annual report of work conducted under the permit. Under Rules Implementing A.R.S. §15-1631 and §41-841 *et seq*., visits to ASM-designated sites for the purpose of determining their current condition are considered archaeological surveys by ASM and also need to be conducted under the contractor's AAA blanket permit.

Pursuant to Rules Implementing A.R.S. §15-1631 and §41-841 *et seq*., an AAA project-specific permit is required before ground-disturbing work can occur within an ASM-listed site situated on lands owned by the state of Arizona (or by instruments of the state). Permitting for sites is based on the official site boundary as held at the ASM Archaeological Records Office (ARO). Project-specific permits are issued for individual excavation or monitoring projects and are valid for no more than one year from the first day of the effective period of issue. Projects conducted on state lands outside the boundaries of ASM-listed sites do not require a project-specific permit in advance of ground disturbance. However, should the ground disturbance identify archaeological resources that warrant a new ASM site designation, project activities in the vicinity of the discovery will need to cease until an emergency project-specific permit has been obtained from ASM and all applicable compliance requirements are met, pursuant to the Rules Implementing A.R.S. §15-1631 and §41-841 *et seq*., Policy 8-202. These requirements include, but may not be limited to, preparing a project-specific treatment plan (or project-specific plan addendum) to be submitted to ASM within 30 days of emergency permit issuance for review and approval and obtaining a Repository Services Agreement from ASM or an equivalent curation agreement from another state-approved curation facility.

Burial Discovery Agreements

The ASM Repatriation Office is responsible for overseeing the protection, respectful treatment, and repatriation of human remains and associated funerary objects, sacred ceremonial objects, and objects of national or Tribal patrimony encountered on state, county, or municipal lands in Arizona under A.R.S. §41-844; A.R.S. §41-865 provides similar protections for human remains and funerary objects encountered on private lands. The ASM Repatriation Office issues Burial Discovery Agreements (BDA) for planned projects within sites on state or private lands, and wherever there is a reasonable expectation that human remains may be encountered. BDAs also are required when human remains are inadvertently encountered on state or private lands. Federal undertakings on state or private lands in Arizona also utilize a BDA, as the federal repatriation statute (NAGPRA) and any agreements that may be developed solely under that statute do not

supersede the requirements of the state law. The permit holder is obligated to carry out the provisions of the BDA reached through consultation following any encounters of human remains or funerary items.

Arizona State Historic Preservation Act (A.R.S. §41-861 *et seq*.)

The Arizona SHPA and associated policies require state agencies to consult with the SHPO regarding the identification, documentation, evaluation, and appropriate treatment of archaeological sites on state-owned or state-controlled lands that are eligible for or listed on the Arizona Register of Historic Places (ARHP) and NRHP. SHPA directs the Arizona SHPO to provide guidance to state agencies and institutions to assist them with their responsibilities to protect and preserve cultural resources on lands they own or control, including technical review and comments on plans and reports submitted by state agencies seeking SHPO consultation. The SHPA also establishes standards for recording and evaluating archaeological resources, assessing the effects of projects on historic properties, and consulting with Tribes and other involved agencies to identify appropriate measures to avoid or mitigate adverse effects.

Confidentiality

State law (A.R.S. §39-125) enables preservation of the confidentiality of archaeological resources information, specifically information relating to the location of archaeological resources or places or objects that are included or may qualify for inclusion on the ARHP. This enabling legislation allows for the withholding of information if there is a reasonable risk of vandalism, theft, or damage to the resource. In general, release of any confidential site information and sensitive information from cultural resource investigations to the general media or public should be avoided. No information should be distributed to news or media outlets or to the public, including via social media accounts or postings. No photographs of a project, artifacts, or features should be taken for personal use or distribution.

The SRPMIC has provided the following instructions regarding the confidentiality of cultural resource information:

SRP-MIC STATEMENT ON BURIALS AND CULTURAL RESOURCE DISCOVERIES

Burials and Cultural Resource Discoveries are Confidential Matters

Salt River Pima-Maricopa Indian Community, Scottsdale, Arizona, April 10, 2017

The O'Odham, (federally recognized as the Pima) of the Salt River Pima-Maricopa Indian Community have been in the Sonoran Desert region for thousands of years from the beginning of human occupation in the area. The O'Odham have a relationship of shared group identity that can be traced historically and prehistorically between the SRP-MIC and the people that inhabited the southern Arizona and the northern region of present day Mexico from time immemorial. As such the O'Odham are legally and culturally affiliated with a majority of archaeological sites found in the Phoenix metro area, as well as much of Southern Arizona.

The Salt River Pima-Maricopa Indian Community does not release information about burial discoveries or cultural resource discoveries for several reasons. Understandably, the first and foremost concern is that publicizing archaeological discoveries before a project is complete makes them vulnerable to disturbance or looting. This is an issue for all archaeological sites. In cases of burial discovery, it is particularly important to safeguard them from damage because burials are the remains of human beings who continue to deserve respect and dignity. Also, it is a

violation of traditional religious beliefs to take photos, video, or other imaging of human remains, funerary objects, and certain other types of discoveries. The SRP-MIC greatly appreciates the press and public's sensitivity to this matter.

# # #

If you would like more information about this topic, please contact Shane Anton at 480-362-6331 or email at shane.anton@srpmic-nsn.gov.

Consultation

COT adopted Resolution No. R2021.08 in 2021, which recognized the lands that comprise Tempe as culturally affiliated with the O'Odham (Pima), Piipaash (Maricopa), and their ancestors. The resolution states that "the land continues to be spiritually connected to the Salt River Pima-Maricopa Indian Community and the Gila River Indian Community" represented by "confederations of two unique groups with their own languages, customs, cultures, religions, and histories; the O'Odham and Piipaash" and that both are "oral history cultures." This resolution also acknowledges that the "landscape is sacred" and "central to their way of life and their self-definition." COT accepted responsibility for "stewarding those places" and solemnly pledged its "commitment in every action."

Consistent with this resolution, the COT's recently adopted Historic Preservation (HP) Plan (City of Tempe 2022) recognizes the need for Tribal consultation and coordination outside of mandated programs associated with the SHPA or NHPA. Within the HP Plan, the following goals and priorities were adopted related to Tribal consultation:

- Goal IV, Priority 10: At the planning stage, consult with Tribes and appropriate agencies to determine the level of cultural resource inventory needed, including assessments of TCPs, sacred sites, and archaeological sites.
- Goal IV, Priority 14: Consider viewshed of and visual effects to cultural landscapes, including identifying criteria for evaluation and coordination for sites of concern (e.g., proposed project height, radius of sacred site to proposed project, shade, and solar studies) in consultation with affiliated Tribes.
- Goal V, Priority 6: Provide Tribes with a full report and documentation of evaluation and consultation process for projects, including procedures for identification and compliance with professional standards including those mandated by relevant permitting agencies.
- Goal VI, Priority 1: Establish dialogue and partnership with the Four Southern Tribes and the Pascua Yaqui Tribe to help identify and provide guidance for preservation and protection of culturally sensitive areas in Tempe. At a minimum, this will include quarterly meetings with the THPOs from the Salt River Pima-Maricopa Indian Community (SRPMIC), the Gila River Indian Community (GRIC), and the Pascua Yaqui, as well as attendance at the Four Southern Tribes Working Group meetings.
- Goal VI, Priority 3: Maintain the role of the HPO as City Tribal liaison, who directly coordinates and meets with THPOs, Tribal NAGPRA Coordinators, and Tribal Cultural Resource Specialists in a Government-to-Government capacity.
- Goal VI, Priority 5: Identify reasonable timeframes for Tribal consultation and input (minimum of 30 days).
- Goal VI, Priority 6: In consultation with Tribes, broaden and refine definition of "consultation" to ensure it is not limited to letter correspondence or informal meetings.

- Goal VI, Priority 7: Review and implement the City's Tribal consultation policy in compliance with Executive Order 2006-14 (now superseded by A.R.S. §41-2051).

Although A.R.S. §41-2051 applies to state agencies, the Tempe HP Plan requires the Tribal consultation program be consistent with state law, which mandates agencies develop and implement Tribal consultation policies; seek input from appropriate elected or appointed Tribal officials before undertaking any action or policy that will, or is reasonably believed to, have the potential to affect a Tribal community or its members; and integrate the input generated from Tribal consultation into the agency's decision-making processes to achieve mutually acceptable solutions. In order to comply with this adopted HP Plan priority, the City will develop a plan, with Tribal input, for the HPO to consult with Tribes that attach religious and cultural significance to historic properties that may be affected by certain projects for which there are no state or federal requirements for consultation with Tribal governments. The list of Tribes and protocols for consultation should be accessed via the G2G Toolkit on SHPO's website..

For federal undertakings, the lead federal agency defines the APE and determines whether the proposed undertaking will have an adverse effect on a NRHP-eligible property. In some situations, NRHP-eligibility testing or site boundary testing will be required prior to making this determination. The federal agency will consult with SHPO, HPO, other involved agencies, and affiliated Tribes for concurrence on the APE and the project's finding of effect. For projects conducted on state land and/or using state funding with a federal nexus, generally a federal agency's compliance with Section 106 will also meet SHPA compliance responsibilities, which are similar to Section 106 requirements mandating consultation with SHPO, agencies, and Tribes.

If the undertaking is determined to have an adverse effect on a NRHP-eligible property, a MOA or PA will be developed among the lead federal agency, SHPO, and other consulting parties, including Native American Tribes. The signatories of the MOA or PA will include at least the lead federal agency and SHPO. It is anticipated that in most circumstances the ACHP will decline to participate in the development of a MOA or a project PA, but if the ACHP opts to participate, then the ACHP would also be a signatory. COT and other consulting parties with significant responsibilities would be invited to sign the MOA or PA as invited signatories, and Tribes and other agencies such as ASM would be invited to sign the MOA or PA as concurring parties. Consulting parties will review and comment on the draft MOA or PA. When the draft agreement document has been signed by the signatories and filed with ACHP, the agreement document is considered to be executed.

For projects requiring archaeological excavation or monitoring, the contractor will prepare an addendum to this plan to be used for consultation. For federal or state projects, after approval of the addendum plan by HPO and the lead federal/state agency (as applicable), the lead federal/state agency will submit the addendum plan to SHPO, other involved agencies, and affiliated Tribes for consultation. For projects not mandating consultation under Section 106 or SHPA, the HPO will submit the addendum plan to affiliated Tribes for consultation. For excavation and monitoring projects conducted within the boundaries of an ASM site on state land (municipal, county, or state property), the contractor will submit the addendum plan to ASM, requesting concurrent review from ASM with other consulting parties. Once the consulting parties and ASM,

if applicable, concur on the plan addendum, permitting requests associated with the proposed archaeological investigations or monitoring may proceed. Consultation will continue to occur throughout the project as part of the Section 106, SHPA, or COT Tribal consultation process.

ENVIRONMENTAL SETTING

Tempe is located in the lower Salt River Valley in the north-central portion of the Phoenix Basin. More broadly, this area is situated within the Basin and Range physiographic province of central and southern Arizona, which is characterized by basin-like valleys framed by fault-block mountain ranges (Chronic 1983). Prominent fault-block ranges in the lower Salt River Valley include the South and Phoenix mountain ranges (ca. 2,600 ft above mean sea level [amsl]) and the substantially higher Sierra Estrella and McDowell mountain ranges (ca. 4,000 ft amsl). The valley floor mainly consists of thousands of meters of unconsolidated sediments that eroded from the surrounding mountains (Péwé 1978:1). Millennia of successive episodes of deposition and downcutting of the Salt River channel created a series of terraces, resulting in a low gradient between the modern floodplain and surrounding uplands.

The Tempe city limits encompass a diversity of landforms, including the Salt River channel and several associated drainages, as well as floodplains, alluvial terraces, piedmont zones, and upland bedrock along both sides of the Salt River (Wellendorf et al. 1986). The areas closer to the Salt River, including downtown Tempe, encompass portions of the modern floodplain, the Holocene-age Lehi terrace, and the Pleistocene-age Mesa terrace along the river. The smaller segment of Tempe on the north side of the river includes the Papago Buttes (just north of downtown Tempe), the distal piedmont adjacent to the of buttes, the gently sloping basin floor areas adjacent to the piedmont, and narrow segments of the Lehi terrace to the east and west of the Papago Buttes. Indian Bend Wash drains southward into the Salt River near the city's border with the SRPMIC territory on the north side of the river. The substantially larger segment of Tempe on the south side of the river also encompasses, from north to south, the floodplain, Lehi and Mesa terraces, basin floor, and the piedmont along the east side of the South Mountains. Prominent bedrock outcrops in this area include Tempe Butte (also known as Hayden Butte) in downtown Tempe and Bell and Twin Buttes, which are located on either side of Interstate 10 (I-10) near its intersection with Broadway Road, approximately 2 miles south of the Salt River channel.

The Phoenix Basin is situated within the Lower Colorado subdivision of the Sonoran Desertscrub biotic community, which is dominated by the creosote-white bursage series and the saltbush series common on the lower basin slopes (Turner and Brown 1982). In the past, vegetation in the more mesic habitats along the Salt River and associated drainages would have included some combination of cottonwood, willow, cattail, reeds, bulrush, arrowweed, and mesquite trees, with higher concentrations of cacti, creosotebush, and bursage in the more xeric habitats. Prehistoric and historic irrigation canals would have artificially expanded the riparian setting onto the upper terraces where water seeping out of the earthen canals would have encouraged mesic plant communities. A variety of rabbits, deer, coyotes, birds, reptiles, and amphibians were prevalent in riparian areas along the river and canals (Rea 1983). The upland areas were characterized by typical Arizona Upland Sonoran Desertscrub, trees, and cactus, especially saguaro and paloverde. In the past, these areas would have supported populations of black-tailed jackrabbit, gray fox, antelope squirrel, and possibly mule deer, bighorn sheep, and other large mammals (Rea 1983). Hence,

prehistoric and historic inhabitants in Tempe were able to access a variety of plant and animal resources in the immediate vicinity. Most of area within the Tempe city limits has been urbanized for decades, and the native vegetation and animal life have been largely extirpated, except for preserved desert landscapes (e.g., portions of Tempe Butte and Papago Park) and scattered undeveloped areas around Tempe.

NATIVE AMERICAN CULTURE HISTORY

As defined by archaeologists and historians, the cultural history of southern Arizona spans at least the last 11,500 years. Among these millennia, scholars traditionally recognize eight main chronological periods and several lesser phases in the Phoenix Basin (Figure 2). Identified prehistoric archaeological cultures for the region include the Paleoindian, Archaic, and Hohokam traditions. Spanish, Mexican, and Euroamerican cultural groups entered the region beginning around AD 1700. Native American groups that inhabited or utilized the area just prior to Euroamerican colonization include the Akimel O'Odham (Pima; the living descendants of the Hohokam cultural tradition), Piipaash (Maricopa), Yavapai, and Western Apache. Today, the Phoenix Basin is a major metropolitan area home to several ethnic groups and cultural traditions. This section summarizes the cultural history of the Phoenix Basin in chronological order to provide context for discussion about previous archaeological research within the project vicinity.

Paleoindian Period

Recent investigations have identified archaeological sites dating as early as 22,000 BC across North America (Adovasio et al. 1999; Bennett et al. 2020; Meltzer 2009; Williams et al. 2018). However, the earliest confirmed human occupation in southern Arizona occurred sometime near the end of the Paleoindian period between approximately 9500 BC and 8500 BC. Evidence of human activity in the region consists mostly of isolated surface finds of fluted projectile points (e.g., Clovis and Folsom points) and a few megafaunal kill sites with lithic assemblages (Agenbroad 1967; Gaines et al. 2009; Haury et al. 1953; Haury et al. 1959; Haynes Jr. 1980; Haynes Jr. and Huckell 2007; Huckell 1982; Irwin-Williams 1979:31; North et al. 2005). Paleoindian resources from the Phoenix Basin specifically are limited to a handful of Clovis points (Agenbroad 1967; Crownover 1994; Huckell 1982; North et al. 2005). Based on the available archaeological data, the Paleoindian cultural pattern in southern Arizona appears to be characterized by dispersed mobile groups of 30–40 people that hunted large mammals (e.g., mammoth, giant sloth, and bison) and collected wild plant materials (Haynes Jr. 1980; Jennings and Smallwood 2019; Meltzer 2009).

Archaic Period

The Archaic period (ca. 8500–1 BC) in southern Arizona marks the 8,500-year period between the end of Paleoindian lifeways and the advent of settled agricultural village life (Huckell 1984a; McBrinn and Vierra 2017). Following the extinction of certain megafauna and the emergence of a relatively stable climate in the early Holocene, mobile groups in the southern Southwest refocused their subsistence economy to hunt medium and small-sized fauna and forage a diversity of wild floral resources. A more localized, cyclical migratory pattern emerged in which mobile groups procured plant and animal resources that were available in various environmental settings at different times of the year (Huckell 1984a; Irwin-Williams 1979; Shackley 1986). Archaic period archaeological sites in southern Arizona are typically characterized by large bifacially worked projectile points (e.g., Gypsum, Pinto, and Jay points), milling equipment, core tools and scrapers, and ephemeral or small features indicative of plant procurement and processing, such as charcoal stains,

roasting pits, and storage pits. Site types from this period include large base camps, small temporary camps, quarry and tool production sites, and funerary features (Bayham et al. 1986; Dart 1986, 1987; 1989:20, 40; Huckell 1984a:139).

Timeline (not to scale)	Period		Phase/Ceramic Sequence	Approximate Date Range
AD 2000 –	HISTORIC		Modern	AD 1970–Present
			American	AD 1850–1970
			Hispanic	AD 1700–1850
AD 1500 –	POSTCLASSIC		Unnamed	AD 1450–1700
	CLASSIC		Civano	AD 1300–1450
			Soho	AD 1100/50–1300
AD 1000 –	PRECLASSIC	SEDENTARY	Late Sacaton	AD 1070–1100/50
			Middle Sacaton 1/2	AD 1000–1070
			Early Sacaton	AD 950–1000
		COLONIAL	Santa Cruz	AD 850–950
			Late Gila Butte	AD 800–850
			Early Gila Butte	AD 750–800
	PIONEER		Late Snaketown	AD 700–750
			Early Snaketown	AD 650–700
			Sweetwater	AD 600–650
AD 500 –			Estrella	AD 500–600
			Vahki	AD 450–500
			Red Mountain	AD 1–450
AD 1 –	ARCHAIC		Late Archaic/ Early Agriculture	2100 BC – AD 1
5000 BC –			Middle Archaic	5000–2100 BC
			Early Archaic	8500–5000 BC
10,000 BC –	PALEOINDIAN		Unnamed	9500–8500 BC

Figure 2. Cultural chronology of the Phoenix Basin (adapted from Abbott 2009; Dean 1991; Huckell 1984a; Wallace 2001, 2004).

Comparison of Archaic period site components and lithic technologies suggests that there was a trend toward increased reliance on plant foods through time (Huckell 1995). By the late Archaic period, cultigens such as maize (*Zea mays*), squash (*Cucurbita*), and tobacco (*Nicotiana*) appear in southern Arizona as some groups incorporated horticulture into their subsistence strategy (Vint and Mabry 2017). Some of these groups occupied well-watered locations (e.g., river valleys) where they constructed small-scale irrigation systems, produced plain ware ceramic containers, and established a semi-sedentary subsistence-settlement pattern (Garraty 2011; Huckell 1995; Jonathan B Mabry 2005; Mabry 1998, 2000, 2009). This new material cultural

pattern is identified as the Early Agricultural phenomenon to distinguish it from contemporaneous mobile hunting and foraging groups. Around 500 BC, large, seasonally occupied villages, some with communal structures, were established in the Tucson Basin and elsewhere in southeastern Arizona (Mabry 1998). Similar large agrarian-based settlements such as those found in the Tucson Basin have not been found in the Phoenix Basin to date, although archaic features have been documented at sites throughout the Phoenix Basin, including within Tempe (Fertelmes and Hackbarth 2022; Graves et al. 2009; Hackbarth 1998:133–141; Phillips et al. 2001). It is possible that early farmers had difficulty in harnessing the larger Gila and Salt rivers (Matson 1991). Alternatively, the archaeological remains associated with these early agricultural traditions may have been effaced or buried by centuries of erosional processes.

Pioneer Period

The Pioneer Period (ca. AD 1–750) in the Phoenix Basin encompasses the Red Mountain, Vahki, Estrella, Sweetwater, and Snaketown phases (following Bayman 2001; Dean 1991). These phases are characterized by an increased reliance on maize agriculture, the construction of irrigation canals along the Salt and Gila rivers, the early development of semi-sedentary villages, and the widespread adoption and development of ceramic containers (Dean 1991; Garraty 2011; Gasser and Kwiatkowski 1991; Howard 1991 [1992]; Howard and Huckleberry 1991; Mabry 2000; Wallace et al. 1995; Woodson 2016). The Pioneer period also marks the beginnings of regional cultural differentiation that culminates in the distinctive Hohokam cultural tradition (Cable and Doyel 1987; Haury 1976; Wallace et al. 1995). Decorated red-on-gray and later red-on-buff pottery, a hallmark of Hohokam material culture, was manufactured in the basin beginning in the Estrella phase. Other characteristics of Hohokam culture that are first observed during the Pioneer period include permanent and aggregated agrarian-based settlements; the widespread adoption of residential and public architectural forms (e.g., pithouses, courtyard groups, and plazas); the development of a shared funerary complex that incorporated a combination of cremation and inhumation with associated funerary belongings; and extra-regional exchange as evidenced by the presence of macaws and parrots, shell, and turquoise (Abbott 2009; Bayman 2001; Cable and Doyel 1987; Doyel 1991a; Fish 2007; Haury 1976; Rice 2016; Wallace and Lindeman 2003).

Colonial Period

The Colonial period (ca. AD 750–950) marks the coalescence of the Hohokam cultural pattern in the Phoenix Basin and its adoption in surrounding regions. Within the Phoenix Basin, this period is characterized by dramatic growth of canal systems, the establishment of numerous large sedentary villages, and the founding of farmsteads and hamlets along ephemeral streams and in upland settings (Dart and Deaver 1983; Doyel 1991b; Teague and Crown 1984). Hohokam settlements typically consisted of one or more courtyard groups—each composed of several related houses surrounding a common living or work space—with refuse features, cemetery areas, and roasting pits arrayed around the margin of the courtyard (J. B. Howard 1985; Wilcox et al. 1981). Large ballcourts were constructed in Hohokam villages starting in the Gila Butte phase. The construction of monumental architecture indicates the beginnings of hierarchical site differentiation, intercommunity integration, and the development of an integrated belief and ceremonial system (Wilcox 1979; Wilcox et al. 1983). Activities held in conjunction with ballcourt events likely included exchange of goods, ideas, and formation of social alliances in the Phoenix Basin and beyond (Abbott 2009; Wilcox et al. 1983). The efficacy of the ballcourt event as an integrative institution is evidenced by the concurrent and

coincidental spread of a host of other material culture (e.g., red-on-buff ceramics, marine shell jewelry, palettes, and censers) that are commonly viewed as distinguishing characteristics of the Hohokam cultural tradition throughout Arizona (Wallace 2014b).

Sedentary Period

Most of the Sedentary period (ca. AD 950–1100/50) is characterized by continued growth in the number and size of Hohokam settlements along the Salt and Gila rivers in the Phoenix Basin as well as in surrounding areas. This period also marks the greatest number and geographical extent of ballcourts, with more than 230 ballcourts present at about 200 sites throughout central and southern Arizona (Marshall 2001; Wallace 2014a). Hohokam economic organization reaches its most complex stage during the early and middle Sacaton phase, when about 90 percent of the pottery consumed by Hohokam households in the Phoenix Basin was produced by artisans residing in just five production locales (Abbott 2009, 2010; Abbott, Smith, et al. 2007; Abbott, Watts, et al. 2007). However, these social, cultural, and economic practices were no longer sustainable by the late Sacaton phase (ca AD 1070–1100/50). In this phase, several settlements in the Phoenix Basin were depopulated as people aggregated in large villages along the Salt and Gila rivers with increased access to reliable water supplies (Abbott 2003; Abbott and Foster 2003; Loendorf and Lewis 2017; Teague and Crown 1984; Woodson 2016). The relocations disrupted the Hohokam economy. Pottery production became localized, presumably at the household level (Abbott 2010), the ballcourt system was discontinued, the distribution of Hohokam material culture largely retracted to the Phoenix Basin, and non-local exchange networks were reorganized (Bayman 2002; Crown 1991; Doyel 1991a; Fertelmes et al. 2012; McGuire and Howard 1987). Hence, the late Sacaton phase is considered a time of considerable cultural transformation in the Phoenix Basin (Doyel 2000).

Classic Period

In the early Classic period, or Soho phase (AD 1100/50–1300), significant changes in Hohokam communities and prevailing cultural practices are evident. The major changes include a shift in funerary practices from cremations to a nearly equal division between cremations and inhumations (Rice 2016); the decline of buff ware production and the rise of red ware pottery as the preferred decorated ceramics (Abbott 2009); the emergence of a new settlement hierarchy (Wilcox 1991); a reorganization in exchange networks as reflected by the shift in the scale of the production and distribution of ceramics and other craft goods (Abbott, Smith, et al. 2007; Abbott, Watts, et al. 2007; Doyel 1991a; Fertelmes et al. 2012); and the florescence of new domestic and public architectural forms, including post- and coble-reinforced adobe-walled structures and platform mounds (Bayman 2001; Crown 1991; Downum and Bostwick 1993; Doyel 1991a). Platform mounds represent an important public component of a new community organization pattern that emerged following the social and economic changes at the end of the Sedentary period. The ceremonies conducted at the mounds likely served to integrate socially distinct groups within and among different settlements (Abbott 2003; Abbott et al. 2021; Elson 2000).

The late Classic period, or Civano phase (ca. AD 1350–1450), is characterized by the elaboration of architectural forms and the development of new social, political, and ceremonial practices. Adobe walls become more massive, compound walls are constructed around domestic and monumental structures, platform mounds become more diverse in size and type, and multistory structures are erected (Abbott and

Foster 2003; Bostwick and Downum 1994; Craig 1995; Doyel 1991a; Elson and Abbott 2000). The web of social networks in the Phoenix Basin is also reconfigured at this time, possibly as elite groups sought to expand their influence though the maintenance of social relations with other elites and by provisioning nonlocal goods for local redistribution (Abbott 2000, 2003; Bayman 2002). Another important hallmark of the Civano phase is the introduction of decorated Salado Polychrome ceramics (i.e., Roosevelt Red Ware) and the corresponding decrease in red-on-buff ceramics.

Archaeological expressions of the Hohokam cultural tradition are more difficult to detect by the end of the Civano phase. In the final decades of the Classic period, large villages along the Salt and Gila rivers were depopulated, large-scale irrigation works were no longer built or maintained; platform mounds ceased to serve integrative purposes; and domestic architecture transitioned from adobe-walled structures and compounds to deep, adobe-lined pithouses and single-unit jacal structures, which tended to be dispersed in a *ranchería*-stye settlement pattern (Abbott and Foster 2003; Bayman 2001; Doyel 1991a; Fish 2007; Hill et al. 2004; Hill et al. 2015; Sires Jr. 1984). The cause and precise timing of these changes is still debated (e.g., Caseldine and Simon 2019; Chenault 2000; Henderson and Hackbarth 2000). The terminal Classic might represent a period of community reorganization following unmanageable drought and flooding (Abbott 2003; Doyel 1995; Graybill et al. 2006; Hegmon et al. 2008; Nials et al. 1989), a time of social fracturing due to the combined effects of environmental change and widespread population shifts (Meegan 2009; Redman 1999), the dissolution of Hohokam sociopolitical institutions as a result of conflict with Yavapai and other mobile groups from the north (Sheridan 2014), or invasions from the south and east (Bahr et al. 1994; Loendorf and Lewis 2017; Sheridan 2014). Future archaeological research may demonstrate that these explanations are not mutually exclusive.

Postclassic Period

The Postclassic (i.e., Protohistoric) period is defined as the time between the end of the Hohokam Classic period around AD 1450 and the arrival of Father Eusebio Francisco Kino in southern Arizona in 1694 (Wells 2006). O'Odham ethnohistoric accounts suggest this period is marked by small-scale settlements, conflict with Yavapai and Apache groups, and shifts in settlement (Darling and Winters Jr. 2021; Rea 1997a, 2007; Saxton and Saxton 1973). Archaeological evidence indicates that the Postclassic period in the Phoenix Basin including the lower Salt River and the middle Gila River represents the continuation of the major cultural traits observed at the end of the Classic period, including dispersed *ranchería*-style settlements, red and plain ware ceramic traditions, and mixed subsistence strategies (Doyel 1991a; Gilpin and Phillips 1998:94–97; Loendorf et al. 2013; Loendorf and Lewis 2017; Wells 2006).

The O'Odham people are the direct, lineal descendants of the people and material culture that archaeologists have termed "Hohokam." The Piipash people are the descendants of the people and material culture that archaeologists have termed "Patayan." The O'Odham recognize Hohokam as *Huhugam* or the deceased ancestors. O'Odham elder and THPO Barnaby Lewis provides the following distinction: "*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…In the O'Odham traditional view, *Huhugam* is used in referring to O'Odham ancestors, identifying a person(s) from whom an individual(s) is a lineal descendant" (Archaeology Southwest 2020).

Loendorf and colleagues (2013:279–281; Loendorf and Lewis 2017) offer multiple lines of archaeological evidence for continuity in economic practices, settlement patterns, and house-construction techniques from the late prehistoric through early Historic period, establishing a direct link between the Hohokam and Akimel O'Odham cultural traditions. Recent ethnographic research (Fertelmes et al. 2022) established Akimel O'Odham affiliation and a close descendant relationship with *Nanakmel Kii*, the ceremonial cave, and its contents, including recognition of O'Odham songs and historical traditions that are related, unequivocally, to prehistoric and historic use by their ancestors, as well as cave artifacts that served as offerings or religious objects used in specific ceremonies. The Piipaash also maintain a historical connection with *Nanakmel Kii*, which they call *Qmpanyk Nyiva* (Spier 1933:245; Winters Jr. 2018:88–89; 2020:105–106). *Nankmel Kii/Qmpanyk Nyiva* (Bell Butte) and '*Oidbaḍ Do'ag/Xwe Nykuuly* (Tempe Butte) have roles in the emergence of a shared group identity after the Piipaash migration to the Phoenix Basin during the Historic period (post AD 1770) that included the mutual recognition of multiple Postclassic Ancestral O'Odham places as traditionally and spiritually significant.

Historic Period

The Historic period (AD 1700–1970) in the Phoenix Basin is marked by the introduction of Spanish, Mexican, and Euroamerican cultural groups into the region. Kino was the first European to venture into the middle Gila River Valley in 1694 and contact the O'Odham populations of the region. The Francisco Vázques de Coronado expedition may have traveled up the San Pedro River in 1542 and interacted with O'Odham-speaking peoples, but no compelling evidence has been found that he visited the lower Salt River or middle Gila River valleys (Flint and Flint 2004; Hartman 1977). At the time of Kino's visit to the middle Gila River Valley, the Akimel O'Odham were living in *ranchería*-style settlements principally west of Casa Grande Ruins (Wilson 2014). Their homes consisted of pithouse-like structures (*ki*, or *kiik*, pl.) and related extramural features, including ramadas (*vato*, or *vapto*, pl.), brush kitchens, and storage structures (Ezell 1961; Garrett and Russell 1983; Rea 1997a). The subsistence economy was based on the cultivation of corn, beans, squash, watermelons, and cotton, and supplemented by hunting and the gathering of wild resources(Darling and Winters Jr. 2021; Dunne 1955; Hackenberg 1974)

Recent projects within Tempe have provided additional evidence for continuity of occupation within the lower Salt River Valley during the early Historic period. For the Arizona State University (ASU) ISTB 7 project, located on the ASU Tempe campus within AZ U:9:165(ASM), radiocarbon results associated with charred grass stems recovered from a possible water management feature produced an assay with a conventional radiocarbon age of 190±30 BP and a highest-probability calibrated date range of AD 1726–1813 (55.1%) (Garraty and Steinbach 2021). Other investigations within AZ U:9:165(ASM) for the 100 Mill project at Mill Road and Rio Salado Parkway identified an extramural thermal pit that contained charred mesquite wood and an abundance of cholla pollen. Radiocarbon dating of the mesquite yielded a conventional radiocarbon age of 180±30 BP and a highest probability calibrated date range of AD 1725–1814 (53.4%) (Fertelmes and Hackbarth 2022). The character and content of these two features provide evidence of Akimel O'Odham land use in the Tempe area of the lower Salt River Valley during the AD 1700s or early 1800s.

The Akimel O'Odham did not experience intensive contact with Spanish, and later Mexican, cultural groups during the early Historic period. Interaction with these groups was largely limited to small parties traveling

through the area or occasional visits to colonial settlements in Tucson or further south. However, cultural practices are not immutable, and substantial changes occurred among the Akimel O'Odham because of European influence in the region. For instance, the Akimel O'Odham incorporated Old World crops such as wheat into their subsistence and trade economies, which resulted in an increased reliance on irrigation agriculture and more permanent settlements by the mid-1700s (Dunne 1955; Ives 1939). Settlement patterns also were greatly affected by external influences (Ezell 1961, 1983; Wilson 2014). Throughout the eighteenth century, Akimel O'Odham settlements became heavily concentrated along the middle Gila River Valley to help defend against frequent attacks by the Apache, Yavapai, and Quechan, who had integrated European horses and weapons into their raiding tactics (Wilson 2014). After 1770, heightened conflict with the Quechan and other Yuman-speaking Tribes of the lower Colorado River area also led to the relocation of the Piipaash (*Xalychidom Piipaash*, People Who Live toward the Water) from the Lower Gila and Colorado Rivers along both sides of the middle Gila River between Gila Crossing and Sacate in the nineteenth century where they lived alongside the Akimel O'Odham (Spier 1933:18, 40; Wilson 2014).

By the mid-nineteenth century, the Pima Villages (as this area was known at the time) were well known by travelers crossing through Arizona along the Gila Trail between California and New Mexico as a waypoint for food and supplies. The 1860 decennial census noted that more than 7,200 acres were under cultivation on the recently established Gila Reservation (established 1859) (DeJong 2007:223–224). Following the Civil War however, intensive Euroamerican settlement and irrigation along the Gila River significantly impacted the landscape of the middle Gila River and the Gila Reservation, resulting in water loss due to intensive agriculture, compounded by drought and flooding in the late nineteenth century. Many of the larger Akimel O'Odham villages fragmented into smaller communities of extended families as a result of economic hardships and Yavapai and Apache raiding. In response, O'Odham and Piipaash participated in US military campaigns against the Yavapai and Apache, which practically eliminated the threat of future attacks in the Phoenix Basin. In the 1870s, a large number of Piipaash and Akimel O'Odham families relocated to the north side of the Salt River near Hayden's Ferry (Tempe) and Lehi (Jones 1960; Wilson 2014).

Initially, those Akimel O'Odham who settled along the Salt River found abundant water and few Euroamerican settlers in the area. However, by the late 1870s, the best agricultural lands had been cleared by homesteaders as the towns of Phoenix, Tempe, Lehi, and Mesa were growing rapidly. The Euroamerican farmers began a campaign of harassment and legal challenges to take possession of Akimel O'Odham farmlands and canals, anticipating that the government would ultimately force the Akimel O'Odham to return to the Gila River Reservation (Comeaux 1991:244; Fontana 1958:92; Jones 1960:307; *Salt River Herald* 1878:November 2, page 3; Zarbin 1997:61). As a response to the increasing number of Euroamerican squatters on the unofficial Akimel O'Odham lands, the Salt River Indian Reservation (now known as SRPMIC) was established by Executive Order on June 14, 1879, encompassing an estimated 46,000 acres that had long been occupied by Akimel O'Odham and Piipaash groups. In addition, the boundaries of the Gila River Reservation, now known as GRIC, were extended north to include an area along the lower Salt River where Piipaash villages were once located (DeJong 1992:389; *Phoenix Herald* 1879; Wilson 2014:157–180, 194–196; Zarbin 1997:61–65).

In the early twentieth century, the proximity of the SRPMIC to the growing modern cities of the valley brought many changes. At the same time, severe water shortages across the Gila Reservation resulted in crop failures and this, in conjunction with the continued acculturation of the native peoples by the American government, hastened changes to the traditional lifestyles of the Akimel O'Odham (DeJong 2011:40). The early twentieth century government-sponsored allotment program permanently altered the cultural landscape of the Akimel O'Odham and Piipaash.

Summary and Discussion

The human history of the Phoenix Basin spans at least the past 11,500 years and includes multiple cultural traditions. Paleoindian or Archaic period groups were present in the region between 9,500 BC and AD 1. The hallmark of the Paleoindian tradition in the Phoenix Basin is the Clovis point (Agenbroad 1967; Huckell 1982). Archaic period material culture in the region consists primarily of large bifacially worked projectile points, core tools and scrapers, and milling equipment (Bayham et al. 1986; Huckell 1984b). While material culture from these mobile groups is uncommon in the COT-vicinity, Archaic period camp sites have been found along the Salt River floodplain (Fertelmes and Hackbarth 2022; Graves et al. 2009; Greenwald and Ciolek-Torrello 1988; Powell and Boston 2004).

The Hohokam cultural tradition prospered in the Phoenix Basin for 1,000 years (ca. AD 450–1450). Hohokam material culture includes Preclassic period ballcourts and residential courtyard groups, Classic period platform mounds and adobe-walled compounds, extensive canal systems, and a suite of finely crafted goods, such as red-on-buff pottery, shell bracelets, clay figurines, and carved-stone censers and palettes (Bayman 2001; Doyel 1991c; Fish 2007; Howard and Huckleberry 1991; Woodson 2016).

In spite of the Euroamerican occupation that began in the mid-1800s, the Phoenix Basin is recognized as the traditional homeland of the Akimel O'Odham and Piipaash and the territorial range of the Pascua Yaqui, Yavapai, and Western Apache. The material culture of the Akimel O'Odham is the most abundant of these groups in the region and its similarity to Hohokam material culture is indicative of the descendant relationship that continues to bind the living Community with their ancestors and historical traditions (Loendorf and Lewis 2017; Wilson 2014).

EUROAMERICAN CULTURE HISTORY

The settlement and growth of the Salt River Valley in the late nineteenth and early twentieth centuries was largely a result of an agricultural economy dependent on a sustainable irrigation system. The federal government established the National Homestead Act in 1862 to encourage settlement of public lands in U.S. territories, including the arid lands of Arizona. Through the late nineteenth century, aided by the cadastral survey and homesteading of the Salt River Valley, intensive agricultural development and construction of independent canal systems occurred along both sides of the Salt River, resulting in the establishment of Phoenix, Tempe, and Mesa. Within a generation after its founding, Phoenix and other communities in the Salt River Valley emerged as the central hub of commercial activity in Arizona, with access to regional and national markets of commerce and industry.

A Brief History of Tempe

Through the late 1860s and 1870s, Mexican American and Euroamerican homesteaders established farms on the south side of the Salt River near Tempe Butte and assisted in the construction of the Tempe Canal and its extensions. In 1871, Charles T. Hayden (1825–1900), a Tucson merchant and freighter, founded a river crossing and store in an area that now comprises downtown Tempe along the northwestern slope of Tempe Butte. This modest settlement was initially called Hayden's Ferry. A post office was constructed soon after in 1872, followed by the Hayden Flour Mill in 1874. Mexican settlers, who had migrated from southern Arizona and northern Mexico, established two separate residential communities—San Pablo and Sotelo Ranch—around the butte (Solliday 1993).

Recognizing that these early, diverse communities shared water from the Tempe Canal, the post office was renamed "Tempe" on May 5, 1879 (Hayden 1972:36; Solliday 1993:56; Solliday and Vargas 2008). Popular legend states that Tempe was so named for the area's reputed resemblance to descriptions of the Vale of Tempe near Mount Olympus in Greece. Tempe was largely a farming community at this time, although many residents worked in the mill and other commercial establishments. In 1885, the Arizona Territorial Legislature appropriated funds for the construction of the Territorial Normal School at Tempe, which started offering classes in February 1886. The normal school was later renamed the Arizona Territorial Normal School (1889), Arizona Normal School (1896), Normal School of Arizona (1899), Tempe Normal School (1912), Tempe State Teacher's College (1925), Arizona State Teacher's College (1929), Arizona State College (1945) and, finally ASU (1958) (Thomas 1960).

Shortly after electing Dr. Fenn J. Hart to serve as the town's first mayor, the town council began municipal improvements in 1895, starting with surveying and graveling the streets to improve drainage. Tempe's first public transportation system was implemented by James C. Goodwin and his brothers using mule-drawn street cars with tracks running along Mill Avenue and 8th Street. James and Robert Goodwin constructed the Kyrene Irrigation Ditch, and, in 1894, they incorporated the Phoenix, Tempe, and Mesa (PT&M) Railway. After many delays, trains began running on the new railway on December 9, 1895. That same day, the PT&M Railway was consolidated with the M&P Railroad to form the Maricopa & Phoenix & Salt River Valley Railroad (MP&SRV RR) (Myrick 1980:519). The Pacific Creamery, constructed in 1892 as an ice factory just east of town on the Tempe-Mesa Road (East 8th Street), was also producing cream, cheese, and milk by 1903. In 1901, significant municipal improvements began when the Tempe Light and Power Company provided the first electric power and limited telephone service was instituted (Lamb 1981), Tempe voters authorized the sale of municipal bonds to build a domestic water system (Pry 2003:16–17, 21), and Frank Murphy incorporated the Phoenix and Eastern Railroad (P&E RR) (Myrick 1980).

The Cotton Crash of 1920 brought the building boom of the early 1900s to an abrupt halt, followed the Great Depression into the 1930s. However, Tempe was not as affected by the economic downturn as industrial cities due in part to a more diverse agricultural base which included crops as citrus, cantaloupe, lettuce, and cotton. Federal recovery programs, notably the Public Works Administration (PWA) and the Works Progress Administration (WPA), continued to provide support for local infrastructure improvements (Ryden Architects 1997). Following the end of World War II, demand for housing and transportation development increased dramatically as millions of service men and women returned home, increasing Tempe's population from less

than 5,000 to 24,897, similar to the exponential growth witnessed by other valley cities (Collins 2005; Solliday 2001; Solliday and Vargas 2008). As the city's corporate boundaries expanded almost tenfold during this time, Tempe's growth continued unabated over the next 15 years (1961–1975). Although Tempe's municipal boundaries were essentially reached by 1975, its growth has continued into the new millennium.

CULTURAL RESOURCE INVENTORY WITHIN THE TEMPE CITY LIMITS

This section contains a brief discussion of previous archaeological investigations and previously recorded prehistoric and historical archaeological sites in Tempe. This discussion is intended to provide a baseline of information to assist consultants, the HPO, and project managers with identifying and evaluating the presence and significance (or potential significance) of archaeological sites in different areas of the city. Per the recently adopted revised HP Plan (City of Tempe 2022:58), "the City's 'Archaeologically Sensitive' boundaries [will be updated] annually, incorporating site buffers (250 ft around known ASM site boundaries), Howard and Huckleberry canal locations per AZSITE (with a 50-ft buffer), and areas identified by SRPMIC as culturally sensitive." To assist with this effort, a cultural resource inventory was prepared, incorporating cultural resource data from AZSITE, ASM's ARO, and Pueblo Grande Museum (PGM), as well as historical records associated with the Hemenway Southwestern Archaeological Expedition (Baxter 1888; see Brandes 1965; Brunson 1989; Frank H. Cushing 1890; Haury 1945), Midvale's (1968) and Turney's (1929a, 1929e) maps of Hohokam settlements and canal systems in the lower Salt River Valley, Howard and Huckleberry's (1991) expansion on Turney's historical maps, National and Tempe Historic Property Registers, ASU project files, and Gila Pueblo (GP) site records. Appendix C summarizes the historical legacy data from these and other sources as they pertain to the Tempe city limits.

It is assumed that this baseline effort will provide the HPO with reference material with which to assess the need for cultural resource work associated with individual projects and proponents, augmented with real-time boundary updates from AZSITE and ARO. Given the scope of the inventory, the methods used for this study were not typical of a full Class I literature review. Specifically, the following procedures and caveats were employed during the current inventory:

- Previous project information was derived from AZSITE and is presented as a presence/absence study. Where possible, projects are coded as to type of investigation (Class III survey, testing/data recovery, monitoring) and noted as pre-2012 (more than 10 years old as of the date of this writing) for the purposes of identifying areas that may benefit from updated inventory, as needed, depending on whether those previous inventories were conducted to current agency standards, if environmental conditions have changed the surface visibility and integrity, and/or if newly age-eligible historical resources may be present (see SHPO Position on Relying on Old Archaeological Survey Data, SHPO Guidance Point No. 5).
- Cultural resource eligibility information is presented using the most recent date of SHPO concurrence or recommendation listed on AZSITE.
- Properties listed in the National and Tempe Historic Property Registers are limited to in-use historical structures (e.g., canals, roads, railroads), and archaeological resources unless a historical building or property has also been assigned an ASM site number.

- Although some cultural resources within Tempe have been subjected to a significant number of investigations, the citations provided in this document are limited to a few representative report references.

Summaries of a select number of previous investigations and known archaeological sites are presented in the body of the plan. Details, including tables and maps, are presented in Appendices A–C. Any future project-specific addenda should include a full Class I literature review with updated project and cultural resource information for the specific project area and appropriate research buffer. Depending on the location of the project, additional data sources (e.g., SRPMIC, BLM, BOR, Salt River Project [SRP], ADOT Historic Preservation Team Portal) may be appropriate to include. Archival records and aerial photographs should also be assessed to determine the historical use of the project area to inform about expected Historic period cultural resources.

Overview of Archaeological Investigations

For over a century, areas within and near Tempe have been the subject of archaeological research. This section briefly outlines some of these significant historical contributions to Hohokam archaeology. A comprehensive summary of archaeological work within Tempe is presented in Appendices A and C.

The earliest known written record of an archaeological investigation in what is now Tempe comes from the Hemenway Southwestern Archaeological Expedition of 1887–1888, led by Frank Cushing (Baxter 1888; see Brandes 1965; Brunson 1989; Frank H. Cushing 1890; Haury 1945). The Hemenway Expedition's base camp—named Camp Augustus—was established on the north side of the Salt River across from Tempe Butte. From this base of operation, Cushing's team recorded mounded features visible on the ground surface in several locations within city limits, including areas later designated as AZ U:9:165(ASM)/La Plaza de Tempe (abbreviated as La Plaza), AZ U:9:48(ASM)/El Pueblo de Los Hornos (abbreviated as Los Hornos), AZ U:9:214(ASM)/Las Acequias, AZ U:9:116(ASM)/El Pueblo de Los Guanacos (abbreviated as Los Guanacos), and AZ U:9:56(ASM)/El Pueblo de Los Muertos (abbreviated as Los Muertos), as well as several unnamed sites.

Excavations were conducted at AZ U:9:48(ASM), AZ U:9:214(ASM), AZ U:9:116(ASM), and most extensively at AZ U:9:56(ASM) in what is now south Tempe and north Chandler, where Cushing established a second base camp (Camp Hemenway). Excavations also were conducted at AZ U:9:59(ASM), a cave located along the east slope of Bell Butte. The Bell Butte (or Double Butte) Cave is a recognized ancestral shrine and TCP (Fertelmes et al. 2022) and is referred to as *Nanakmel Kii* in the O'Odham language and as *Qmpanyk Nyiva* in the Piipaash language, both of which names translate as "Bats' Home" (see *Overview of Traditional Cultural Properties in Tempe* below for more information) (Winters Jr. 2012:86-87; 2018:88; 2020:106-107). Few complete notes and records from the Hemenway Expedition's work in the Salt River Valley are known to exist (Brunson 1989:33–37), although subsequent researchers have been able to piece together portions of the expedition's findings (Brandes 1965; Brunson 1989; Haury 1945; Turney 1929c; Wilcox and Howard 1990).

Additional regional-scale surveys of the prehistoric sites in areas of the lower Salt River Valley, including Tempe, occurred in the early 1900s (Fraps 1928; Schroeder 1940). In 1928, Frank Midvale identified and documented sites throughout the valley on behalf of the Gila Pueblo Archaeological Foundation in Globe, Arizona. In what is now Tempe, north of Baseline Road, Midvale recorded 19 sites, all of which were assigned GP site numbers and documented using site cards and photographs. Most of the GP sites in Tempe can be matched with ASM or ASU sites, and many have been incorporated into the current boundaries of ASM-designated sites including AZ U:9:165(ASM), AZ U:9:214(ASM), and AZ U:9:48(ASM).

Around the same time as Midvale's GP survey, Clara Lee Fraps (1928) conducted a survey of sites in the lower Salt River Valley (among other regions of the state) as part of her master's thesis project at the University of Arizona. Fraps (1928) reviewed published sources to identify known or suspected habitation sites of varying size and complexity, which she referred to as "pueblos" (Fraps 1928:1). Fraps' research identified 25 pueblos within the city limits although, like Midvale, she mostly excluded south Tempe from her study, identifying only two sites within 1 mile south of Baseline Road. Although Fraps' research did not provide specific site descriptions, only locations (some of which have been demonstrated to be inaccurate), most of the sites on her map can be reasonably correlated to a modern ASM or ASU site.

In the late 1930s, Odd S. Halseth, then-Director of the PGM in Phoenix, obtained funding from the Works Progress Administration (WPA) to implement the Salt River Valley Stratigraphic Survey (SRVSS). Halseth coordinated with Emil Haury, Chair of the Department of Anthropology at the University of Arizona at the time, to help plan for and manage the project. The goal of the SRVSS was to conduct test excavations at as many sites as possible in the lower Salt River Valley to recover sufficient ceramic materials to allow the establishment of a regional chronological sequence (Bostwick 1993:197). To accomplish this goal, the SRVSS team, led by Albert Schroeder, set out to identify and map habitation sites with visible mounds of dense artifact concentrations ("trash mounds"), and excavated trenches within these mounds to obtain a controlled sample of artifacts. Fieldwork took place periodically between 1938 and 1940 and included areas along the middle Gila River and Queen Creek, in addition to the lower Salt River Valley. Schroeder presented the results of the SRVSS fieldwork in his master's thesis for the University of Arizona (Schroeder 1940). In total, the SRVSS crew recorded 110 sites, of which nine were documented within Tempe city limits; most of the SRVSS sites in Tempe can be correlated with current ASM- or ASU-designated sites.

In addition to the early survey and site-recording efforts, several researchers drafted regional-scale maps of the Hohokam canal systems and associated settlements in the lower Salt River Valley, including Tempe, starting in the early 1900s. The first of these researchers was Herbert Patrick, who published a map of Hohokam settlements and canal systems in 1903, although collection of the data possibly started as early as 1878 (see Howard 1991b). Omar Turney's (1929c) later map of prehistoric irrigation networks and settlements shows more detail than Patrick's map, and Midvale's (1966) subsequent map showed updated locations of canals and settlements in the greater Tempe area. These earlier efforts helped inform Howard and Huckleberry's (1991b) detailed and comprehensive map of the Hohokam canal systems and major settlements, including the projected locations of distribution canals in some areas. Until recently, Howard and Huckleberry's map was the most complete and up-to-date map of Hohokam settlements and canal systems

in the lower Salt River Valley. However, ongoing research (e.g., Caseldine 2020) continues to provide new information regarding the establishment and evolution of these Hohokam irrigation systems through time.

During the 1980s, cultural resource management (CRM) companies, government agencies, and other organizations began developing and formalizing a set of procedures and requirements for implementing federal, state, and municipal historic preservation laws, which was set in motion by the U.S. Congress's passage of the NHPA in 1966. Passage of the NHPA subsequently led to the creation of similar laws dealing with state, municipal, and private properties (see *Legal Contexts and Permitting* section). These laws required construction managers and planners to evaluate cultural resources and mitigate adverse effects resulting from ground-disturbing construction and other activities, which has frequently involved CRM specialists and consulting firms. Over the past ca. 40 years, hundreds of CRM archaeology projects have taken place within Tempe. The 283 projects documented within AZSITE (e.g., conducted under an AAA permit) encompass over 5,058 acres or roughly 19.8 percent of the Tempe municipal area (see Appendix A). Class III surveys constitute the vast majority of the projects (215), with 22 monitoring projects, 25 testing projects, and 21 data recovery projects also represented; 233 projects (ca. 82 percent) occurred prior to 2012.

Overview of Archaeological Resources in Tempe

To identify archaeological sites within the city limits, Logan Simpson compiled site records from both standard and readily accessible sources of information (Appendix B), as well as non-standard and less accessible sources, as summarized below and in Appendix C. Most of the site information for this inventory was obtained from standard sources including AZSITE, the statewide database of archaeological resources managed by ASM, as well as records at the ASM ARO that are not yet available on AZSITE (see Appendix B). Most of the sites in AZSITE and the ARO records are designated with ASM site numbers, although these data sources also include sites designated with Pueblo Grande (PG), ASU, and GP site numbers. In general, sites with PG and GP site numbers were recorded in the early to mid-1900s before the ASM site numbering system was developed, and most have not been formally documented to current professional standards since their original recording.

Per AZSITE and ARO, there are a total of 88 cultural resources previously documented within Tempe that include seven multicomponent, 26 Euroamerican (historic), and 31 prehistoric sites (see Appendix B). Of the 26 historical sites, 12 have been documented as in-use historical structures. Additionally, there are 20 previously recorded cultural resources for which no cultural or temporal affiliation is available, due to pending entry into AZSITE or missing/absent data. Most of the documented cultural resources are located within northern Tempe, surrounding the Salt River and encompassing a large majority of downtown Tempe. Of the 88 previously documented cultural resources on AZSITE and ARO, 66 have been evaluated for eligibility and/or inclusion in the NRHP/ARHP. Among these resources are eight historical resources that have been listed on the NRHP/ARHP under Criterion A (n=4), C (n=2), and A and C (n=2), as well as one historical resource that was formerly listed on the NRHP/ARHP but has been removed due to demolition. Of the remaining evaluated cultural resources, 23 have been determined eligible, 11 have been recommended eligible, and eight have been determined not eligible (see Appendix B for more information regarding these resources).

Logan Simpson also examined non-standard sources of information to help identify archaeological sites or potential sites that have not been formally documented or assigned an ASM site number (see Appendix C). Non-standard sources examined include, but are not limited to, records from the Hemenway Expedition, Gila Pueblo, the Frank Midvale collection (hardcopy records available at ASU Hayden Library), site-record archives at the PGM (including the SRVSS records), and technical reports to identify potential sites within the city limits that have not been assigned an ASM or ASU site number. Other non-standard sources of site information include the comprehensive site and canal system maps of the lower Salt River Valley compiled by Patrick (1903), Turney (1929a), Midvale (1966), and Howard and Huckleberry (1991b). Many of the canal locations depicted on these maps are projected but have not been verified in the field. The SHPO recently has determined that the prehistoric canal systems and projected canal alignments in the lower Salt River Valley associated with the Huhugam culture are eligible for inclusion in the ARHP and NRHP under Criterion D (letter from Kathryn Leonard [SHPO] to Rebecca Yedlin [FHWA] dated July 22, 2022). Appendix C presents a discussion of the non-standard background resources used to identify cultural resources within the city limits.

Prehistoric Resources

Given the abundance of prehistoric cultural resources within the Tempe municipal boundaries, a sample of sites are discussed below. These sites were selected because they have been the subject of recent standardized investigations for which significant interpretive information was gathered and because they represent major prehistoric archaeological sites that likely played a significant role in the settlement of the Tempe area and the organization of its extensive irrigation systems (see *Prehistoric Water Control* later in this section and *Research Design/Water Management*). Each of these cultural resources also represent examples of archaeological sites that are TCPs. Following these site summaries, a general discussion of the extensive prehistoric water control system of Tempe is presented.

AZ U:9:165(ASM)

AZ U:9:165(ASM) is a large multicomponent site that includes a Hohokam village encompassing an area of 1.45 km^2 (380 acres). The site generally follows the northern cusp of the Pleistocene-age Mesa terrace on the south side of the Salt River starting at the southeastern base of Tempe Butte and extending in an east-southeast direction for a distance of about 2.5 km. The site boundary includes areas of dense occupation related to village-level settlement interspersed with irrigated farm fields and other non-habitation land-use zones associated with resource procurement and processing. Major habitation areas have been documented along the gentle escarpment between the Lehi and Mesa terraces (Steinbach 2018; Steinbach and Rice 2014), which generally follow the modern alignments of Eighth Street and Veteran's Way/Valley Metro's light rail line, respectively, on the east and west sides of Rural Road.

The portions of AZ U:9:165(ASM) to the south and southwest of the terrace escarpment (i.e., of Veteran's Way/Eighth Street) includes prehistoric agricultural lands, resource procurement areas, and irrigation features situated outside the main habitation areas (Howard 1991b; Midvale 1966; Turney 1929c). The northernmost of the east/west-orientated main canals in this area (Canal Tempe) formed the southern boundary of a dense habitation area (Jacobs and Rice 2001; Steinbach and Rice 2014), with refuse features

lining the north side of the canal along the edge of the habitation zone. Field houses and other agricultural features have been recorded within AZ U:9:165(ASM) to the south of Veteran's Way/Eighth Street (Brunson 1981; Garraty 2002; Jacobs and Rice 2001; Jensen et al. 2001; Jensen et al. 1996; Punzmann 2011; Rice and James 1988; Steinbach, Watkins and Bustoz 2008; Steinbach, Watkins and Rice 2008; Watkins 2011). A prehistoric trackway was identified by Environmental Planning Group (EPG) while conducting investigations along Eighth Street prior to construction of the Valor on Eighth Apartments (Rayle and Swanson 2019). The 2-m long trackway, located on the edge of a prehistoric field lateral, was comprised of footprints from at least four individuals, as well as a possible handprint, possible animal prints, and unidentified impressions.

Maps from the early 1900s depict three platform mounds within AZ U:9:165(ASM) (see Howard 1991b). Although development over the twentieth century has obscured surface indications of these features, recent investigations have identified two of these structures. Data recovery conducted south of the Wells Fargo Arena (Garraty 2018; Punzmann 2011) identified significant archaeological and historical evidence that a Hohokam platform mound once stood in the area. The inferred mound location was situated within a dense concentration of habitation features along Veteran's Way between Hayden Butte and Rural Road. In another recent data recovery project along Eighth Street for the proposed Multi-Use Path and Streetscape project, Logan Simpson identified a large structure constructed of adobe, possibly representing a O'Odham *va'aki* (ceremonial house). An ethnographic study is in progress, which will include historical studies on O'Odham sacred architecture and sharing of traditional knowledge and oral histories (Fox et al. 2020:6, 10, 17).

The presence of sacred architecture in the form of one or more ceremonial houses (*va'aki*) or the earthen platforms that supported them, as well as a human footprint trackway (Rayle and Swanson 2019), contribute to AZ U:9:165(ASM)'s eligibility as a TCP. In addition, areas of the site representing formerly irrigated fields also relate to oral traditions embodied by the adjacent topographic landmark and TCP known as Tempe Butte (*'Oidbad Do'ag*).

Tempe Butte ('Oidbad Do'ag)

Standing at 1,495 feet (456 m) in elevation at its highest point, Tempe Butte ('*Oidbad Do'ag*), also recognized as Hayden Butte, is the most prominent geographical landmark in Tempe. The area is considered sacred and important by the Hohokam and descendant communities, as evidenced by the numerous petroglyphs and artifact scatters that have been documented within the property boundaries (e.g., Kiser 2011; Loendorf and Loendorf 1995; Wright 2004). The butte also is considered a culturally important place among contemporary Native American groups in the region. The entire 59-acre footprint of Hayden Butte is listed on the NRHP under Criteria C and D (Number 11000175) and on the THPR (https://www.tempe.gov/government/community-development/historic-preservation/historic-preservation-facilities-directory/-selcat-335/-npage-2). The butte consists of two lobes—and larger western lobe and smaller eastern lobe—with a saddle in between. COT owns the land encompassing the western half of the larger western lobe; ASU owns the land encompassing the eastern half of the western lobe, saddle, and eastern lobe. The saddle encompasses the grounds of the ASU Sun Devil Stadium and this portion of the butte was mostly obliterated during its construction in the 1950s and subsequent additions.

A comprehensive literature review for the Tempe Butte area compiled by Kwiatkowski and Wright (2004:36) reveals the area has yielded prehistoric cultural materials spanning the Colonial through Classic periods. However, both Pioneer period Hohokam and protohistoric-age deposits have been identified during investigations at the base of the butte, suggesting a long period of use (S. Kwiatkowski 1999; To et al. 2003). In addition to petroglyphs, documented feature types include structures, refuse features, terraced gardens, bedrock mortars, grinding slicks, and low-density artifact scatters possibly representing offerings. The abundance and complexity of petroglyphs in particular suggest that the butte likely was a locus for symbolic, ceremonial, astronomical, and/or ritual/religious activities (Kwiatkowski and Wright 2004:40).

During a full-coverage, high-intensity survey of the COT-owned western lobe of the butte, Loendorf and Loendorf (1995) recorded 512 individual petroglyphs and 232 discrete petroglyph panels (see also Loendorf 1996). A later assessment conducted by Wright (2004) identified additional petroglyph panels, including panels on the ASU-owned east half of the western lobe and the smaller eastern lobe of the butte. According to Loendorf and Loendorf (1995:135–138), the types and locations of glyphs on the butte, as well as the close spatial association of the butte with AZ U:9:165(ASM), suggest a focus on ceremonies related to calendrical events, possibly to assist with scheduling communal and subsistence activities (e.g., the agriculture calendar) (Hunt et al. 2005).

Numerous individual archaeological sites have been recorded on the butte over nearly a century, including sites designed with GP, ASU, and ASM site numbers. However, the ASM-ARO consolidated all site numbers on the butte under AZ U:9:165(ASM) in 2020. The western lobe of the butte and the saddle between the eastern and western buttes had comprised the now-delisted site area of AZ U:9:114(ASM). The eastern lobe of the butte is currently not defined as part of an ASM-designated site, although it is surrounded by AZ U:9:165(ASM) along its western, southern, and eastern flanks. Importantly, however, the TCP and NRHP-listed property encompass the entire butte footprint (i.e., both lobes and the saddle). The approximate northern half of the western butte also had been defined as the now-delisted site of AZ U:9:115(ASM)/Terraced Butte Site, which is now encompassed within AZ U:9:165(ASM). Previous investigations in AZ U:9:115(ASM) revealed a small prehistoric and protohistoric habitation area and associated agricultural features (Droz et al. 2008; Kwiatkowski 2000) as well as a historical component (Jackman Jensen et al. 1996; Jensen et al. 2001).

The butte also encompasses four historical resources identified as the following sites: the Hayden Flour Mill Complex (AZ U:9:278[ASM]) and segments of Hayden Canal (AZ U:9:189[ASM]), the Phoenix and Eastern Railroad (AZ U:16:299[ASM]), and the Maricopa and Phoenix and Salt River Valley Railroad (AZ U:16:298[ASM]). In March 2020, the ASM-ARO consolidated ASM sites AZ U:9:6, U:9:62, U:9:64, U:9:80, U:9:114, U:9:115, U:9:188, U:9:190, U:9:216, U:9:269, U:9:278, U:9:281, U:9:284, U:9:296 and U:9:309(ASM) into the newly revised, expanded boundary of AZ U:9:165(ASM) (see Appendix B).

AZ U:9:116(ASM)

AZ U:9:116(ASM) was originally recorded by Frank Cushing in 1887 as a pithouse village with a large ballcourt (Frank Hamilton Cushing 1890).The site was given the name Los Guanacos based on the discovery of multiple clay figurines depicting “camelid-like” animals, more recently interpreted as canids (Chenault and

Lindly 2006; Darling et al. 2015). Excavations conducted in 2000 encountered funerary features as well as structures, refuse and borrow pits, and hornos. Chronometric data indicated that the area was used for domestic habitation during the middle to late Sedentary period (ca. AD 950–1100) and as a cemetery sometime during the early Classic period (AD 1100–1200).

The residential area consisted of six courtyard groups comprising between two and six houses, with different construction styles and sizes. Analyses indicated the site residents cultivated corn and possibly agave, harvested wild plants, and hunted various animals, particularly rabbits. Notably, investigations identified 19 guanaco/dog figurines in one of the courtyard groups. Although little evidence was found for on-site production of specialized items, the site's location near the southwest terminus of the Riverview Canal System (Caseldine 2020) would have allowed its residents access to a wide variety of trade items, including pottery, obsidian, chert, and shell ornaments, as well as clay figurines, censers, and palettes (Lindly et al. 2003).

AZ U:9:116(ASM)'s eligibility as a TCP includes the presence of a ballcourt, *huhugam ha kovolka* in O'Odham; although generally associated with the ancient ballgame, these features may have been used as a dance ground and were certainly the locus of inter-village gatherings and ceremony (Darling et al. 2015). Furthermore, the early recognition of cached, iconic guanaco/dog figurines has drawn significant attention to the importance of these sacred objects and the role of this site in acknowledging their continued importance as objects of cultural patrimony and the need for respectful treatment and handling, up to and including repatriation to the Akimel O'Odham.

AZ U:9:48(ASM)

AZ U:9:48(ASM), also known as La Ciudad de Los Hornos, is an extensive Hohokam village that was first described by the Hemenway Expedition of 1887–1888 (Frank Hamilton Cushing 1890). As originally recorded, the site contained several mounds, architectural remains, a "sun temple" (ballcourt), and several conical ovens, the *hornos* from which it derives its name. As a well-known local archaeological site, AZ U:9:48(ASM) was mentioned in the writings of subsequent early researchers such as Patrick (1903), Midvale (n.d.), and Turney (1929c), who referred to the site as "Casa de Loma." Much of the early research at the site was conducted by avocational archaeologists; later research has been conducted by ASU and most recently by private CRM consulting firms.

AZ U:9:48(ASM) was one of the largest Hohokam sites established under the Sedimento and Riverview Canal Systems south of the Salt River in the Phoenix Basin (Caseldine 2020). The site is known to contain numerous habitation areas including both pithouse groups and Classic period compounds, communal areas, cemeteries, and refuse disposal areas. At least 2,200 features dating from the Pioneer period Vahki phase (or earlier) to the late Classic period Polvorón phase (ca. AD 480–1500) have been either described or investigated at the site. Howard (1990) notes the presence of at least three ballcourts, including one large Snaketown-style ballcourt and two smaller Casa Grande-style ballcourts. Agricultural fields would have been located to the north, downslope from a series of four main canals, not all of which operated contemporaneously. A system of terraced gardens, perhaps the largest identified in the Phoenix Basin, was located immediately to the west of this village site and was likely maintained by residents of the site.

AZ U:9:48(ASM) is recognized as TCP for its multiple examples of sacred architecture and ballcourts (*huhugam ha kovolka*), in particular. It's relationship with terraced gardens located on the flanks of the sacred mountain, *Muhuaḍag* (South Mountain), and canal irrigation also tie in with well-remembered traditional cultural practices such as field blessings of the Akimel O'Odham and the O'Odham in general, who relied on a variety of agricultural strategies to sustain village life. The NRHP-listed Yaqui Cemetery (a TCP) and the original townsite of Guadalupe also is located within AZ U:9:48(ASM).

AZ U:9:214(ASM)

AZ U:9:214(ASM) is a Hohokam site that was initially recorded during the Hemenway Southwest Expedition of 1886–1887 and named for the number of canals that flanked the occupation areas of the site. The plotted boundary of the site straddles the municipal boundaries of Tempe and Mesa, being generally located along Apache Boulevard/Main Street and Broadway Road, between Price and Dobson Roads. Limited investigations at AZ U:9:214(ASM) indicate the site was initially established in the Preclassic period (possibly Colonial or Sedentary) and expanded in area with a much larger population in the Classic period (Hackbarth 1996).

Although the location of the Hemenway Expedition investigations at AZ U:9:214(ASM) is unknown, their artifact catalogue indicates that an estimated 182 funerary features were encountered and at least 15 "house units" were sampled with the collection of 525 artifact specimens including pottery and clay objects, stone tools and special items (e.g., projectile points, axes, knives, shaft straighteners, palettes, figurines), shell, wood, and perishables (i.e., basketry and textiles) (Haury 1945:163–171). Later maps of AZ U:9:214(ASM)—notably by Turney (1929e) and Midvale (1945)—depict numerous small mounds and at least two possible platform mounds surrounded by multiple canals and distribution laterals; however, by the time these maps had been published, much of the site area had been levelled for agriculture and commercial development along old US 80.

In the mid-1980s, ADOT sponsored several pedestrian surveys along the proposed "Outer Loop Freeway" (SR 101) in close proximity to AZ U:9:214(ASM) (Howard 1996; Stone 1986a, 1986b). These surveys identified several Preclassic period sites, including AZ U:9:68(ASM) (La Cuenca del Sedimento), AZ U:9:69(ASM), and AZ U:9:71(ASM). Subsequent data recovery conducted by Northland Research, Inc. (Northland) and ASM at these sites (Ackerly and Henderson 1989; Henderson 1989; Masse 1987) identified remnants of more than 50 structures (small pithouses and field houses) as well as pits, use surfaces, and two inhumations. The research also identified at least 37 water control features, including main canals, distribution laterals, and farm laterals affiliated with the Sedimento and Riverview systems (Caseldine 2020), one of which yielded a calibrated radiocarbon age of 200 B.C.–AD 208 (Henderson 1989:102). These findings suggest that AZ U:9:68(ASM) was established as a seasonally occupied farmstead in the early Pioneer period (ca. 130 B.C.–AD 275) and intermittently occupied through the Preclassic period, coincident with the further development and expansion of the canal systems (Henderson 1989:334–356). By the Sedentary period, AZ U:9:68(ASM), AZ U:9:69(ASM), and AZ U:9:71(ASM), appear to have become components of a settlement complex wherein AZ U:9:214(ASM) was the focal village.

In 1988, Northland conducted data testing on a privately owned parcel just south of Apache Boulevard near the Mesa municipal border. The testing project encountered human remains and identified 16 prehistoric features including possible structures; three historical features (manure pits) also were found (Hutira 1988). Northland's subsequent data recovery effort documented a total of 128 features, including structures, hornos, extramural hearths, possible refuse features, pits, and miscellaneous features. At least 38 architectural features were identified (i.e., pithouses, as well as adobe pit structures, surface rooms, and walls), from which Northland confirmed at least one possible Preclassic period courtyard grouping, and three Classic period adobe compounds (Ruins I, II, and III). Northland also recovered 65 inhumations, many from within structures but also from at least five cemetery areas within and around the three compound structures (Cemeteries A–E) (Hackbarth 1996). Based on stratigraphic position and the presence of temporally diagnostic wares, the cemeteries were established in the Classic period, with at least two cemeteries (Cemeteries B and E) dating to the Civano phase (AD 1300–1350/1450).

Monitoring investigations by Archaeological Consulting Services, Ltd. (ACS) were conducted in advance of the construction of the Valley Metro Light Rail project along Apache Boulevard, and more intensive data recovery was completed at the intersection of the southeast corner of Price Road and Apache Boulevard for a proposed park-and-ride facility. The combined monitoring and data recovery efforts documented 55 features, including historical features, prehistoric thermal pits, and exposures of at least 44 canals and three undefined water control features (Luhnow and Jones 2010). The canal exposures were part of the Sedimento and Riverview systems based on Caseldine's (2020) study, indicating that the canals within and west of the Loop 101 corridor documented by Northland were hydrologically separate from the canals that passed through the original AZ U:9:214(ASM) site boundary; this would not have precluded residents of AZ U:9:214(ASM) from playing a managerial role in these (Riverview) canals during the Classic period. One radiocarbon date was obtained from canal deposits, indicating use of the investigated canal during the late Sedentary to early Classic period, which compares favorably to radiocarbon dates from field houses, canals, and associated features investigated in other portions of the Riverview and Los Muertos irrigation systems (Ackerly and Henderson 1989; Henderson 1989; Masse 1987).

As with many sites in urban centers, poor preservation at AZ U:9:214(ASM) has made it difficult to verify the presence of sacred architecture including early reports of two platform mounds. Nevertheless, the complexity of the site and presence of multiple cemeteries and adobe cemeteries, generally support these earlier observations. While it is likely that this site is a TCP, further investigation and consultation with the descendent community is needed to support an eligibility recommendation.

Prehistoric Water Control

The Hohokam are known for spatially extensive canal systems, which have been documented throughout the Phoenix Basin (Howard 1991 [1992]; Howard and Huckleberry 1991; Midvale 1966; Turney 1929b) (Howard 2006). Previous research identified four major irrigation systems along the lower Salt River: Canal System 1, Canal System 2, the Scottsdale System, and the Lehi System (Howard 2006). According to Howard (2006), Canal Systems 1 and 2 and the Scottsdale System operated successfully until the Lehi System was constructed sometime during the Sedentary period, triggering water shortages. Traditionally, this interpretation has been used to model diachronic processes of change and growth in Hohokam economic

systems and the effects these systems had on sociopolitical development (e.g., Ackerly et al. 1987; Cable and Doyel 1987; Howard and Huckleberry 1991). In particular, long-term water shortages caused by endemic floods documented along the lower Salt River during the late AD 1300s have been proposed to explain the fundamental cultural changes that marked both the Preclassic-Classic period transition and the early-to-late Classic period. These floods are hypothesized to have damaged the irrigation systems at various times, leading to water shortages which, according to traditional interpretations, would have resulted in diminished agricultural production, thus prompting sociopolitical change and eventually culminating in the system's disuse around AD 1450.

Over the past several decades, research on prehistoric irrigation systems has greatly increased our understanding of the dynamics of irrigation system operations leading to reinterpretations of canal use-lives and remodeling, impacts of seasonal flows on canal morphology, and flow capacities of the various systems. Most recently, as part of doctoral dissertation research, Caseldine (2020) conducted a reevaluation of historical aerial photographs of the Tempe-Mesa-Chandler areas, analyzed historical streamflow estimates to infer prehistoric annual flows, and examined data from archaeological excavations to reconstruct the development and evaluate the long-term function of Hohokam canal systems in the lower Salt River Valley through time. Caseldine's (2020) research demonstrated that large floods were a common occurrence along the lower Salt River throughout the Hohokam sequence. While some water deficits no doubt occurred within irrigation systems throughout their use-lives, by the late Colonial period the Hohokam were well adapted to withstand flood events of different magnitudes and designed their hydraulic infrastructure to facilitate rapid repair and replacement (Ackerly et al. 1987; Nials and Gregory 1989; Woodson 2015) as well as to allow continuous modifications necessary to meet the subsistence needs of a growing population.

Using geoarchaeological evidence, Caseldine (2020:94–98) posits that it was an extremely large flood event that swept through the lower Salt River Valley between the late Colonial and early Sedentary period (ca. AD 900) that profoundly altered life along the Salt River and pushed the Hohokam to expand their irrigation systems and adopt more complex and efficient irrigation strategies (i.e., standardized irrigation units [SIU]). The resulting infrastructure would have allowed more effective water management and easier system expansion while requiring social relationships that cut across settlement boundaries (Caseldine 2020:101). Importantly, Caseldine's (2020) research allowed prehistoric canals to be identified and combined into chronological groups for each irrigation system. Multiple lines of evidence revealed that rather than four systems, Hohokam farmers in the Salt River Valley operated eight major systems, with the Lehi System and Turney's old Canal System 1 now reinterpreted as comprising four distinct systems (Crismon, Sedimento, Riverview, and Los Muertos) extending south of the Salt River, and the Coyote System, the Scottsdale System, and Canal System 2 extending north of the river (Caseldine 2020:258–262). The developmental histories of these systems suggest that after the devastation of the extremely large flood of ca. AD 900, the survivors were able to reestablish agricultural production, with systems that were damaged beyond repair (e.g., Sedimento System) replaced by new systems (e.g., Riverview System).

Chronological evidence indicates that at least portions of Canal System 2 and the Crismon, Sedimento, and Coyote systems were in operation by the middle-to-late Pioneer period (Howard 2006). However, the limited extent of the smaller systems, the location of settlements (e.g., AZ U:9:165[ASM]) away from canals, and the

paucity of documented habitation structures dating to this time suggest that for the most part these early systems were simple, likely involving coordination among only a few households (Caseldine 2020:175). During the Colonial period, Canal System 2 grew to its full lateral extent, the Scottsdale System was established, and the Crismon, Sedimento, and Coyote systems expanded, while the number of settlements increased. Following the extremely large flood at the end of the Colonial period and beginning of the Sedentary period, agricultural production and settlement within the Crismon System appears to have shifted toward the edge of the Mesa terrace and north away from the floodplain in Canal System 2; the initial Scottsdale System intake area was reestablished slightly to the north; and the Sedimento System intake was replaced with a new system, the Riverview System, several kilometers downriver (Caseldine 2020:177–178).

Based on Caseldine's (2020:272) research, persistent water deficits do not appear to be the underlying cause of the sociopolitical transformations that marked the Sedentary-Classic period transition or the settlement and demographic changes that characterized the early-to-late Classic period. As relatively few studies have focused on system structure and dynamics along the Crismon, Sedimento, Riverview, and Los Muertos systems (especially compared to Canal System 2 on the north side of the river), any additional information about canals and irrigation obtained from archaeological investigations could make a significant contribution to our understanding of these extensive systems and their evolution through time.

Historical Resources

Transportation

Historically, Tempe—like other communities in the Salt River Valley—was surrounded by fertile, cultivated lands that were watered by a network of canal systems. Arterial roads generally followed irrigation laterals along the section lines, although some roads—including old 8th Street—followed main canal alignments. Tempe was, in the late nineteenth century, a widely dispersed agricultural community that covered the south half of Township 1 North, Range 4 East, from the river to the baseline (now Baseline Road). Many of the early settlers were farmers living on 160-acre homesteads spread across 12,000 acres of irrigated farmland under the Tempe Canal system. Commercial development in Tempe was concentrated along Mill Avenue through the early decades of the twentieth century. The Arizona Territorial Normal School (today Arizona State University) was established along Eighth Street (later designated University Drive) in 1885 and would be a major influence in the growth and development of Tempe through the new millennium.

In the late nineteenth and early twentieth centuries, Tempe was the recipient of three railroad branch lines that significantly influenced the industrial and commercial growth of the city on both a regional and national scale (Figure 3). Just as the railroad was essential to Tempe's growth, so too were automobile routes extending through the Salt River Valley. Much of the current Apache Boulevard alignment between Tempe and Mesa was a component of the old Tempe-Mesa Road as well as the Apache Trail after completion of Roosevelt Dam in 1911. Over the next two decades, Apache Boulevard was fully incorporated as US Highway 80 (which was shared by US 60, 70, and 89). Prior to World War II (1939–1945), the landscape across Tempe remained predominantly agricultural. In the post-World War II era, cultivated agricultural fields gave way to urban and suburban development. Commerce and industry expanded exponentially along major arterial corridors across the city. The postwar urban transformation of the landscape occurred across the entirety of the Salt River Valley and is now an extensive metropolitan area with several million residents.

Mexican American Barrios in Tempe

Although the relationship between Euroamerican and Mexican American settlers initially was amicable, as the twentieth century progressed, the increasing number of Mexican immigrants from a politically ravaged Mexico began to change the cordial relationship between local Euroamerican and Mexican groups. Concentrated Mexican American communities were established into distinct enclaves, or *barrios,* through segregation mandated via local and state legislation. San Pablo, the most prominent barrio in Tempe, was located just east of Hayden's Ferry along the southern edge of Tempe Butte (Figure 4). San Pablo was eventually subsumed by Tempe's growth. Increasing segregation in the 1900s led to the establishment of San Pablo as Barrio al Centro, with its immediate neighbor Barrio Mickey Mouse.

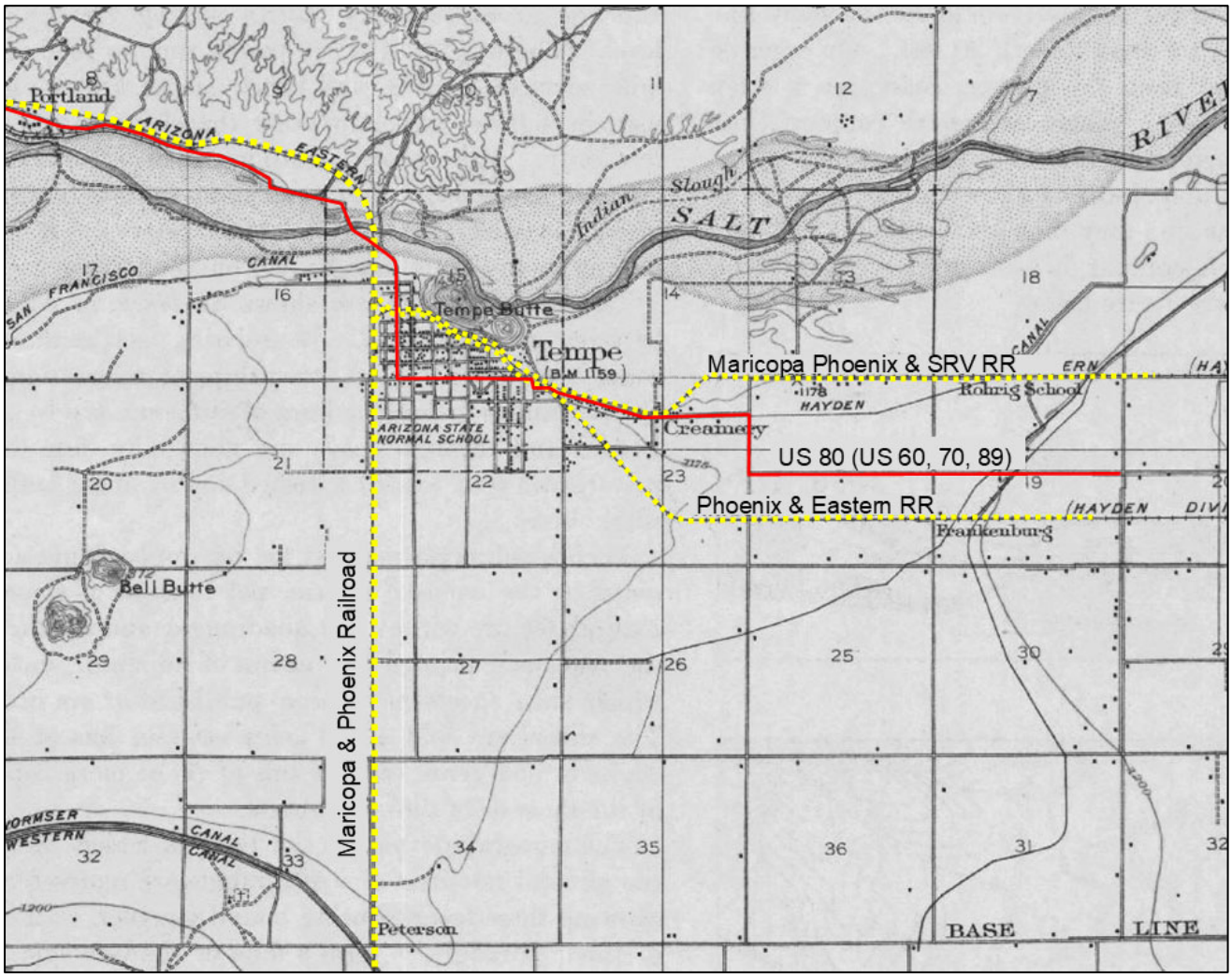

Figure 3. A portion of the 1915 Mesa topographic quadrangle (1:62500) showing the location of historical transportation corridors in Tempe.

Following World War II, segregationist attitudes changed resulting in increased integration of Mexican Americans. At the same time, postwar urbanization affected the established Mexican American communities. One of the most significant impacts to the barrios occurred during Arizona State College's rapid expansion

of its Tempe campus during the mid-1950s, which resulted in the razing of Barrio al Centro and Barrio Mickey Mouse for the construction of new dormitories and the Sun Devil Stadium. (Solliday 1993:120–121).

Due to their location within the urban core of Tempe, Barrio al Centro, Barrio Mickey Mouse, and Barrio del May's have benefited more from historical documentation by historians and archaeologists than other Tempe barrios that emerged in the twentieth century (*Arizona Citizen* 1873; Solliday 1993:57–59). Most of these other barrios were located within or adjacent to Tempe's urban core, generally bounded by the Salt River and Broadway Road (north to south), and Priest Road to the Tempe Canal (east to west). Two barrios were located further from Tempe's urban core: Salsipuedes (located along Price and Guadalupe Roads) and the incorporated Town of Guadalupe, which was populated by a mix of Yaqui and Mexican American residents (Ryden Architects 1992:11–15; Solliday 1993; Vinson 1991b).

Historical Water Control

Several canals were established in the first decade of Tempe's Historic period settlement, notably the Kirkland-McKinney Ditch (ca. 1869), Tempe Canal (ca. 1871), and San Francisco Canal (ca. 1870–1871) (Figure 5). In this early period, there were two main laterals of the Tempe Canal, including the Hayden Ditch (which subsumed the Kirkland-McKinney Ditch) and the Western Extension. Completed between 1871 and 1874, the Hayden Ditch originated near the extreme northwest corner of Section 16, Township 1 North, Range 5 East, extending westerly toward Tempe Butte, thence closely paralleling the slope of the butte to the Hayden Flour Mill. In the same decade (1870s), the tail race of the Hayden Ditch was extended to the San Francisco Canal to provide a more reliable source of water to farmers and settlers west of

Tempe (Jones et al. 2008; Schultz and Franklin 1891; Zarbin 1997). The Western Extension (aka Petersen Ditch, completed in 1872) was constructed by Niels Petersen and other farmers; the lateral extended westward from the main canal, following the south section lines of 26–28, Township 1 North, Range 4 East to Petersen's homestead (currently on the intersection of Southern Avenue and Priest Drive) (Andersen 1989). Before the turn of the new century, the Tempe Canal had been extended to the south, and additional laterals were constructed by farmers, including the Morrow and George ditches/laterals (Gifford 2013; Schultz and Franklin 1891; U.S. Reclamation Service 1904). Other ditches constructed in Tempe included the Stinson, Spanish, Miller, Oury, and Double Butte ditches/laterals; the locations of these lesser ditches, as shown on archival maps, have not been ground-truthed (Andersen 1989:8–10).

To the south, in the Kyrene area, water was made available in the early 1890s via two main laterals: the Wormser (Tempe South Canal Extension) and the Kyrene Extension; however, these Tempe Canal extensions provided only limited water to lands currently in south Tempe. Before the new century, laterals of the Consolidated Canal had also been extended westward to farmers in need of water. As shown on the 1903–1904 topographic maps of the Salt River Valley (U.S. Reclamation Service 1904), many privately owned and maintained farm ditches were in use across the bulk of the current city boundaries, conveying water from the Tempe and Consolidated Canals to cultivated lands (including those discussed above). Tempe's landscape was rural in this period and through the first several decades of the twentieth century.

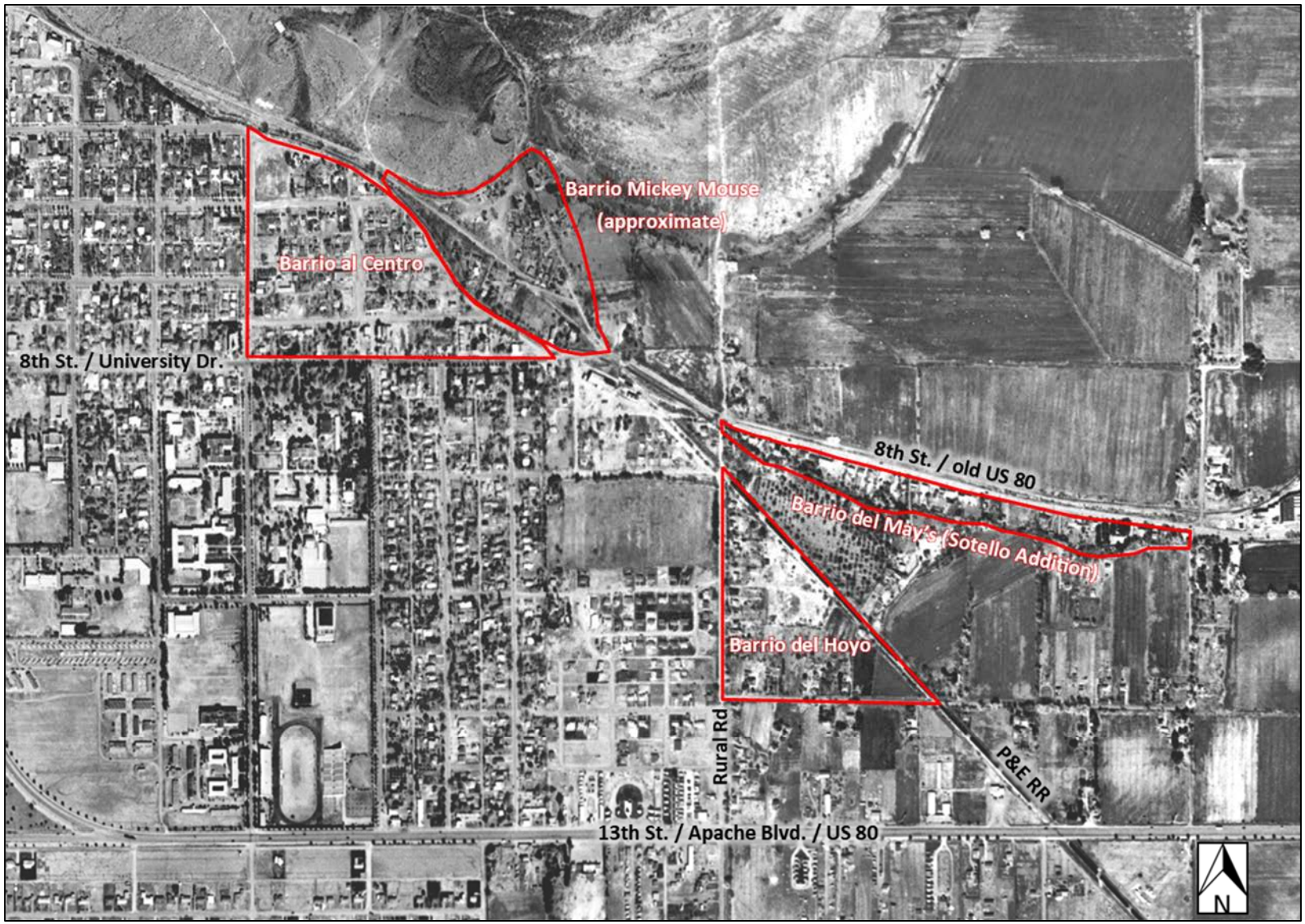

Figure 4. 1949 aerial photograph of Tempe (Flood Control District of Maricopa County 2022) showing the locations of some Mexican American barrios in the urban core of Tempe.

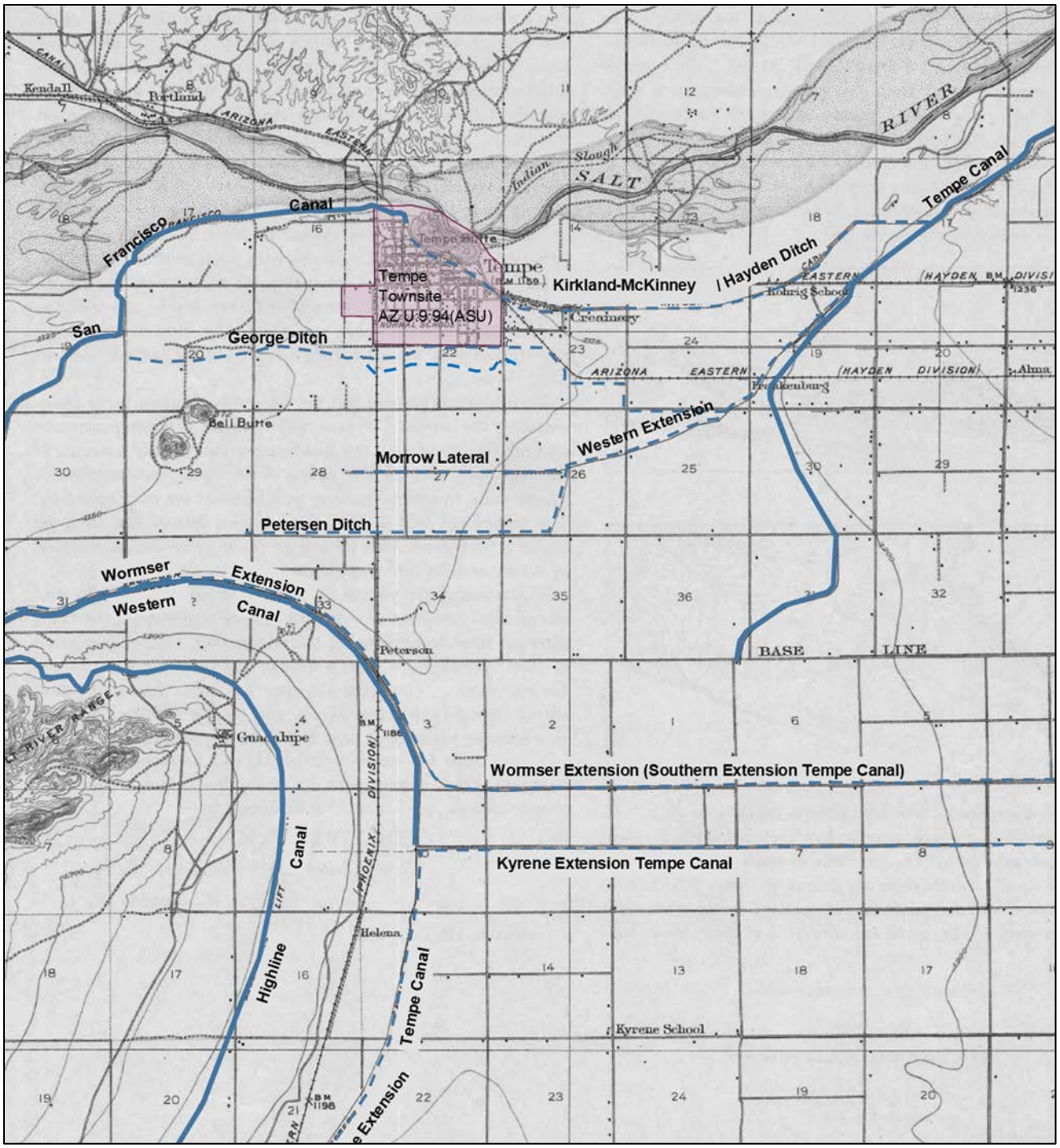

Figure 5. A portion of the 1915 Mesa topographic quadrangle (1:62500) showing the location of major historical water control features in Tempe, as well as the boundaries of the historic Tempe Townsite (AZ U:9:94[ASU]).

The amount of water claimed by privately owned canals headed on the Salt River was typically far greater than the normal flow capacity of the river. Moreover, over the course of several decades, conflicts arose regarding appropriation rights, i.e., the right of an individual to divert water for irrigation purposes from public streams. While Territorial laws were established to recognize rights of appropriation, regulation was either nonexistent or implausible (Hamilton 1886; Zarbin 1997). President Theodore Roosevelt, at the turn of the

new century, aggressively pursued federal legislation providing for reclamation of western lands, resulting in the National Reclamation Act (1902) and a search for suitable dam locations across the western United States.

Over the course of many decades, several large projects were completed in Arizona by BOR, including the Salt River Project (Salt and Verde rivers), which was largely constructed and maintained by the Salt River Valley Water Users Association (SRVWUA) (Zarbin 1986). Between 1906 and 1923, the SRVWUA gradually acquired the main canal systems along both sides of the Salt River. The canals, distribution laterals, and private farm ditches were significantly improved, realigned, or abandoned as necessary for a more efficient delivery system. On the north side of the river, the Grand Canal was extended east (ca. 1911–1912) to the newly constructed New Crosscut (aka Arizona Crosscut) and Crosscut Hydro Plant (ca. 1913–1914).

Due to significant delays in acquiring the Tempe Canal system, the SRVWUA constructed feeder laterals from the Consolidated Canal (which had recently been acquired) to provide water for two new canals that were under construction for farmers in south Tempe, south Phoenix, and Laveen. Known as the Highline and Western Canals, both were completed over several years (1911–1914) (Andersen 1989, 1990b; Andersen and Noland 1990; Killoren et al. 2008). Over time, the Western Canal subsumed the Wormser and Kyrene Extensions, which had heretofore been affiliated with the Tempe Canal.

The locations of the historic canal and ditch alignments depicted in Figure 5 are based on historical aerial photographs and maps; as such, their locations are more confidently known than the projected locations of most prehistoric canals. The Grand, Western, Tempe, New Crosscut, and Highline Canals, as well as the Crosscut Hydro Plant, are listed in the NRHP as contributing components of the SRP Diversion and Conveyance Historic District under Criterion A for their role in the general contexts of Politics and Government, Agriculture, and Community Planning and Development (1906–1938) (MacDonald and Bailey 2017). In an assessment of open laterals across the Salt River Valley, BOR identified the criteria to be used for assessing the historical eligibility and significance of lateral ditches based on surrounding landscapes, probability of long-term preservation, unique aspects, and community interest. Identified in the study as the “Keane Criteria,” these criteria included (Gifford 2013:5):

1. The lateral is associated with a SRP canal of historical importance
2. The lateral was part of the pre-SRP (nineteenth century) canal system.
3. The lateral occurs in “special areas” such as historic farmsteads or historic districts.
4. The lateral is a dirt canal or has concrete lining that has not been changed recently.
5. Vegetation is planted near and dependent on the water [that] flows in the lateral.
6. The lateral has good visibility, public access, and/or recreational use.
7. The lateral has a good visual fit, an integrated part of the community landscape.

By combining the Keane criteria with the NRHP criteria, ditches were evaluated both for significance and for community support of preservation. The primary area of significance for Criterion A eligibility was association with the SRP Diversion and Conveyance Historic District. Additionally, some resources were assessed for eligibility under Criterion C for structures constructed by the Civilian Conservation Corps (CCC). Three categories of open laterals were identified in the 2013 study (Gifford 2013:6–7):

- *Category 1*: Laterals not worthy of preservation (can be piped with no adverse effect)
- *Category 2*: Laterals to be preserved
- *Category 3*: Laterals to be preserved but are threatened with development or have safety and/or operation and maintenance problems to be addressed.

Within Tempe, segments of four open laterals have been identified as worthy of preservation (Category 2–3) (Table 3) (Gifford 2013:Tables 1–3).

Table 3. Summary of Open Laterals to be Preserved in Tempe[1]

SRP Lateral No.	Lateral Name	Location	Keane Criteria	Length (miles)
--	Indian Bend Pump Ditch	Papago Park: Curry Road	3–7	0.71
2-4.6	Canal Park	Mill Avenue and Curry Road	3–7	0.42
6-5.0	Hayden Ditch	Eighth Street: Dorsey to Elm Streets	3–7	0.09
		University Drive and Rural Road[2]	4–7	0.11
6-5.0	George Ditch	Mill Avenue to McCallister Boulevard	3–7	0.50
7-2.6	Kyrene Branch	Elliot to Ray Road	4–7	2.14

[1] Data from (Gifford 2013: Tables 1–3)

[2] Category 3 lateral: Provisionally Preserved Lateral, Kirkland-McKinney Ditch and listed on the Tempe Historic Property Register (Tempe Historic Property No. 25) (Nucci 2005), HAER documentation for the main canal including the Hayden Ditch (HAER No. AZ 16) (Andersen 1989).

Tempe Townsite/AZ U:9:94(ASU)

The Tempe townsite was designated a site in 1988 by ASU shortly after the testing and data recovery of the Goldwater Building (located at 650 E. Tyler Mall) (James 1991; James and Rice 1988) (Figure 5). Although the ASU project focused on excavations for the Goldwater Building, the townsite was defined as a roughly square-mile area essentially consisting of the S½ of Section 15 and the N½ of Section 22 in Township 1 North, Range 4 East. The reports describe associated cultural resources as including historical structures, streets, canals, and railroads on the 1927 Sanborn-Perris Fire Insurance maps of Tempe, as well as Hayden's Ferry and Barrio al Centro. These reports did not specifically use the site designation in their fieldwork results summaries; however, the 1991 data recovery report does call out AZ U:9:94(ASU) in Table 1.1 as encompassing the Goldwater Building (James 1991:1-4).

The original townsite temporarily received an ASM number for the ASU Block 12 data recovery project conducted by ACS in 2012 (AZ U:9:309[ASM]) (Fangmeier 2012). However, a subsequent review by ASM significantly reduced the ASM boundary of AZ U:9:309(ASM) to the Block 12 project area and the site was into AZ U:9:165(ASM) in 2020 (ASM site card summary, AZSITE Inventory No. 87068). Although AZ U:9:94(ASU) is not registered with ASM, nor is it evident on SHPO inventories, the site is occasionally referenced by cultural resource investigations that have occurred within its boundaries (Fangmeier 2012;

Kwiatkowski 1997a, 1997b; S. M. Kwiatkowski 1999; Kwiatkowski 2001; Kwiatkowski and Wright 2004; Stone and Hathaway 1994; Stone and Ayres 1985). While not recognized by ASM, portions of AZ U:9:94(ASU) are currently subsumed within the site boundary of AZ U:9:165(ASM).

OVERVIEW OF TRADITIONAL CULTURAL PROPERTIES IN TEMPE

The COT, under Resolution No. R2021.08, recognized the lands that comprise present-day Tempe as culturally affiliated with the Akimel O'Odham (Pima), Piipaash (Maricopa), and their ancestors. In so doing, the City accepted responsibility for stewarding the sacred landscape and solemnly pledged its "commitment in every action." This responsibility also extends to the other Native communities or Tribal organizations that have historical and cultural affiliation within the city limits such as, but not limited to, the Pascua Yaqui, Yavapai, Hopi, Zuni, Mohave, and Apache (G2G Toolkit, https://sites.google.com/view/az-consultation-toolkit/tribes). Tribal perspectives, therefore, are fundamental to historic preservation planning, based on insights that stem from the creation of the world to recent historical events. Oral traditions recall places on the land, such as natural landforms and water sources, archaeological sites, traditional ecological knowledge, Native medicine, cultural practices, and historical traditions. Many such places and practices are protected in accordance with statutory obligations guaranteed under federal, state, and municipal laws and regulations.

TCPs are properties that may be eligible for inclusion in the NRHP/ARHP because of their association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of that community. TCPs matter because they comprise the tangible places that "function as living parts of the communities that ascribe cultural value to them" and are important in the retention and transmission of traditions and cultural practices (Parker and King 1998:1, 23). TCPs are often associated with Native American Tribes; however, other ethnic or social groups and historical immigrant communities also ascribe cultural value to properties and places. To sustain the historical and cultural foundations of Tempe, therefore, these places also should be recognized and preserved.

TCPs are eligible for inclusion in the NRHP when they are shown to meet one or more of the criteria set forth in the NRHP regulations (36 CFR Part 60). To be eligible for inclusion in the NRHP/ARHP, properties must have "integrity of location, design, setting, materials, workmanship, feeling, and/or association" (36 CFR Part 60). Integrity is a little different when identifying and documenting TCPs and should address two fundamental questions: (1) does the property have an integral relationship to traditional cultural practices or beliefs; and (2) is the condition of the property such that the relevant relationships survive? (Hardesty and Little 2000; King 2003; Parker and King 1998:11). If the answer is yes, then the property probably qualifies as a TCP.

These guidelines have been used to make eligibility recommendations for the properties within Tempe (Appendix D). However, Tribal consultants and THPOs frequently recognize that the application of NRHP guidelines limits what they might consider eligible on the basis of consultation and Tribal perspectives (Darling et al. 2015). This serves to underscore the importance of consultation with Tribes and cultural groups when conducting TCP research. In addition, as mentioned above, TCPs by definition are not limited solely to extant Native American communities that maintain a historical affiliation with Tempe, such as the Akimel O'Odham and Piipaash. As an integral part of continuing efforts to perpetuate Tempe's diverse culture

history, TCPs may be recognized that are affiliated with African, Asian, and Hispanic American communities, communities whose historical foundations reside in a system of shared beliefs and practices (such as the Mormon, Jewish, Muslim, or other faith-based groups), or a shared history or experience such as the lesbian, gay, bisexual, transgender, queer (LGBTQ) community. Long-standing neighborhoods and economic centers (markets) may also contain properties, buildings, or features older than 50 years that reflect the beliefs and practices of a cultural group, which also meet NRHP criteria for TCP eligibility. Consultation and ethnographic research with these descendent or affiliated groups, therefore, is not only paramount but also a necessary part of the TCP identification, documentation, and evaluation process.

A wide range of information sources can be used to identify TCPs. These sources address the cultural background and history of Tempe that enable the researcher or planner to consider the frequency and kinds of TCPs that might be present. In general, every property, whether natural, historical, ethnographic, or archaeological, should be evaluated for NRHP/ARHP-eligibility on its own merits and on a case-by-case basis. Natural resources such as springs, mineral deposits, stands of plants, landscapes, and topographic features are not by definition TCPs unless they are clearly associated with the cultural beliefs and practices of a *living* community and can be evaluated under one or more of the four NRHP criteria. Even so, these are often the most frequently identified TCPs within traditional cultural landscapes.

For the original inhabitants of Tempe, the Akimel O'Odham and Piipaash, places or properties that are generally (and sometimes specifically) identified in oral history, oratory, and song culture are likely to be considered TCPs. In addition, these places may have names in the O'Odham or Piipaash languages that further relate them to historical events and persons, including former traditional religious or divine leaders, who helped to create what is Tempe today (Darling 2016; Darling et al. 2015). For communities that rely on oral communication and memory culture for the transmission and perpetuation of knowledge across generations, these places are the foundation for traditional systems of knowledge and cultural practice that are closely tied to traditional homelands. When names are forgotten or traditional places are destroyed or built over, the natural connection of the land with descendent communities becomes broken, land legacy disappears, and the cultural identities of the many diverse communities that founded and continue to reside within the city limits becomes lost. Identification, documentation, and management of TCPs will perpetuate these cultural values and the cultural legacy of Tempe for future generations.

It is important to note that TCP inventory and documentation also brings with it the responsibility for ensuring that the dignity of all affiliated Tribes and cultural groups who make up the diverse communities of Tempe is supported by the COT. Cultural and historical information can be very sensitive and, at times, confidential. Consultation, once again, is key to ensuring that TCP management incorporates those aspects of respect that affiliated cultural groups require to best care and manage their TCPs.

Sacred Sites

Sacred sites are specific locations where Native American religious practitioners go, or have historically gone, to perform ceremonial activities in accordance with traditional cultural beliefs and rules of practice. Many TCPs are sacred sites; however, sacred sites are also protected by additional federal policy. Executive Order 13007 was instituted in 1996 to provide access to and to accommodate the ceremonial use of American

Indian sacred sites by practitioners on federal lands as well as to avoid adversely impacting the physical integrity of these places.

Sacred sites may include a variety of locations such as cemeteries, natural landforms, caves, or artificial constructions (e.g., shrines, places where people gather to conduct ceremonies or pilgrimages). Such places do not need to meet certain criteria to be considered sacred or be older than 50 years, but they are places of worship that continue to be venerated or used in some capacity. As noted above, consultation with affiliated Tribes for the identification, management, and protection of such places is essential.

Tribal Perspectives

For Native communities, nearly all affiliated ancestral properties, especially archaeological sites, are culturally sensitive and should be left undisturbed whenever possible. Other culturally significant properties may include natural landforms (mountains and buttes), rivers, and springs; resource areas (plant, animal, or mineral resources); traditional places that continue to be used or venerated, such as historical villages, cemeteries, sacred or religious sites; and even topographic landmarks, where knowledge resides in the oral tradition and cultural practices conducted there. These places can be archaeological sites, but they are also locations or properties that may defy standard archaeological site definitions. For example, the nesting place of eagles or a stand of plants used for food or medicine can be culturally sensitive but would not be identified as an archaeological site. These, along with certain other cultural places, are also recognized and protected by the federal government as TCPs and sacred sites.

Many of these locations, be they cultural properties or natural resource areas, may not appear as they did a century ago. However, this does not imply that they have lost their setting or integrity, at least not for the affiliated cultural group or community. For example, for many Tribes, named mountains in urban settings retain the spiritual attachments and cultural wisdom embodied by the geographic feature (see for example, *‘Oidbaḍ Do’ag and Nanakmel Kii,* below). Despite the many recent changes in the setting, this wisdom can be related to traditional knowledge systems, history, song culture, and religious ceremonies, which are all interconnected. As Tribal elders often remind the people, the songs and oratory are sacred because of their attachment to the land and to the places where they come from, not the other way around. Habitats are sacred, which means the birds and animals are also sacred. Cultural traditions and practices also reside in traditional homelands, where the ancestors of today’s Tribal descendent communities are interred. Best practices for management of TCPs, therefore, incorporate Tribal perspectives and those of other cultural groups in urban planning and the protection of cultural corridors, greenspaces, and viewsheds. In doing so, the city becomes a participant in the perpetuation of the cultural values of its founding communities.

Traditional Cultural Properties General Descriptions

As Tempe’s original inhabitants, most of the city’s known TCPs are affiliated with the Akimel O’Odham and Piipaash community. Among them are topographic landmarks, bedrock mortars and grinding areas, water sources, sacred architecture, shrines, cemeteries, historic villages, and rock art. These are described below; however, in no way should this discussion be interpreted as an exhaustive list of types or categories of TCPs in the Tempe area. TCPs, in fact, are frequently identified during cultural and historical resource inventory, documentation, cultural resource investigations, and consultation as part of cultural and environmental

processes for projects within the COT. For this reason, environmental consultants should include an approach for identifying and evaluating potential TCPs in the project-specific addendum.

Water Sources

The Akimel O'Odham believe that water is life in the Sonoran Desert and that people have a responsibility to protect it. Many water sources are identified in traditional narratives, oral history, and ceremonies to bring rain and to ensure that water is available in abundance. Water has healing qualities, and springs or natural bedrock tanks where water may accumulate often are associated with petroglyphs and grinding areas. The late O'Odham elder, Joe Joaquin, is remembered for saying that, "water has always been sacred, and it needs to be treated as a sacred object… that is the O'odham way." Sources of water that have been identified as TCPs include natural springs or ponds (*shon*), rivers (*akimel*), or artificially constructed containments such as reservoirs (*vachkĭ*). These may be named or remembered in traditional oral histories. The ocean (*kahchk shuudagĭ*), particularly the Gulf of California, is a TCP, whose waters also communicate with Blackwater Lake (*Chukuma Shuudagĭ*) in the O'Odham homelands. Ocean waters also are what remains of the ancient floods that covered the world. Seashells, salt, and other objects with connections to the ocean may be considered items of cultural patrimony for the O'Odham and the Piipaash (Angela Garcia-Lewis, personal communication 2022).

Canals and ditches as water conveyances are part of O'Odham traditional history that may contribute to the eligibility of the water source (as a TCP) from which the water is derived. Specific locations along canal systems, for example ancient headgates and associated settlements situated at high water locations on the river also may be TCPs or part of a larger TCP associated with the origin point of a canal system. Rivers, like oceans, typically are TCPs. However, locations along the shores or the riverbank with traditional religious, cultural, or ecological significance may be identified as culturally sensitive TCPs in their own right. These can include riparian areas, pools for fishing, or whirlpools, which may be spiritually invested (see *akimel* below). Traditional water sources identified as TCPs are generally eligible for the NRHP under Criterion A for the events that took place in those locations, including daily activities and ceremonies, and for their continued use as a resource. Water sources identified as TCPs also may include artificial constructions such as traditional *vavhia* (wells) and *vachkĭ* (reservoirs), which may take on similar significances as natural sources that continue providing water long after they were constructed. Water sources and associated historical villages are commonly identified by name such as *Gook Vapchkĭ* (Two Ponds), *Chuuv Vavhia* (Jackrabbit Well), or *S-Toñ Shuudag* (Hot Spring) Thus, the importance of water sources to traditional geospatial information and knowledge systems in traditional landscapes also is significant to the living culture of a community under Criterion D.

Topographic Landmarks

Topographic landmarks are naturally occurring prominent hills, buttes, ranges, or mountains. Many of them have unique bedrock outcrops exhibiting indigenous rock art (*o'ohoḍag*) from multiple periods. Differences in size and shape of individual landmarks provide the basis for traditional names in the O'Odham and Piipaash languages. Traditional names also may identify or describe significant historical events or other cultural associations that took place in those locations. These topographic features remain in peoples' memories, orient them within their traditional landscape, and remind them of associated traditions and

activities. Most of the topographic landmarks in Tempe are remembered by name or by their traditional Tribal histories. Some events are recorded in the O'Odham calendar stick records (*u'us hikvina*) and in traditional songs. Many topographic landmarks are shrines and continue to be used for traditional religious and non-religious activities such as resource gathering. Tempe is uniquely charged with multiple buttes (Twin Butte, Bell Butte, and Hayden/Tempe Butte, for example) that have been revered for centuries for their spiritual qualities and the knowledge and power that resides within them.

Topographic landmarks are eligible under Criteria A and D for their role in the perpetuation of geospatial and associative information in the oral history of communities that rely on place-based knowledge systems for the perpetuation of cultural traditions. Such places may be the home of divine spirits or deities or have spiritual and religious qualities that are recognized through traditional religious practices or events in history These events are remembered in ceremony either at these locations or in reference to them, sometimes in traditional oratory. Topographic landmarks that are TCPs, especially mountains, have place names and are identified in song culture, which contribute to their eligibility under Criteria A and D for the ethnohistorical information they contain and are associated with traditional religious and secular activities, events, and the linkages that bind these places with each other and with traditional homelands.

Bedrock Mortars, Cupules, and Grinding Areas

Mortars and cupules are a common feature on naturally occurring bedrock exposures that are suitable for grinding and pulverizing plant and mineral resources. Bedrock mortars are commonly associated with petroglyphs in foothill locations away from habitation sites. In the O'Odham language the word for mortar is *chepa* (Mathiot 1973:[Vol I], 69; Saxton et al. 1983:9), and the pestle is *chepidakuḍ* (Mathiot 1973:[Vol I], 84). A place called *chechpak* is a place where many *vavch'eḍ chechpa* (bedrock mortars) are found (Winters Jr. 2020:169). The Akimel O'Odham and Piipaash used mortars in conjunction with stone and wooden pestles for milling bean pods from the mesquite tree and for grinding palo verde seeds, cotton seeds, and the heads of salt-bush plants (Bell and Castetter 1937:24; Dart and Reed 2020; Felger 1977:156; Rea 1997a). *Chepa* also can have a ceremonial or religious function for receiving offerings and are sometimes built into religious shrines (Dart and Reed 2020:26). In Tempe, *chepa* are commonly found on buttes or other topographic landmarks with suitable bedrock outcrops, like Bell Butte and Hayden/Tempe Butte. Due to their association with traditional religious and secular activity, bedrock mortars are typically identified as TCPs under Criterion A. However, eligibility may also extend to Criterion D with respect to their location, other site associations, and traditional use, or possibly Criterion C if the form, location, or arrangement of these features is unusual or representative in some way.

Sacred Architecture

Certain prehistoric sites are revered by the O'Odham and Piipaash as shrines for their role in the oral traditions, their identification as power places, and their association with ancient religious leaders. These leaders are remembered by the O'Odham as the *sivañ* (Rea 1997a:90), and the ancient ceremonial houses, some of which existed on top of platform mounds, are called *va'aki*. Ballcourts or *huhugam ha kovolka* are sunken courts with encircling berms that were constructed for use in the ancient ceremonial ballgame or as dance grounds. Racetracks or *memilikuḍ* were locations where intervillage gatherings included ceremonial

performances and footraces. *Memilikuḍ* may appear as long parallel alignments of stones. In general, the Akimel O'Odham and Piipaash consider sites with sacred architecture to be TCPs (Darling et al. 2015).

Sacred architecture is eligible under Criterion A for its role in historic and current religious practice. Use of religious objects or buildings or the performance of ceremony, repeatedly, in a particular location will consecrate that location, and its sacred significance will not diminish over time. *Va'aki* (ancient ceremonial houses) and associated platform mounds, known or unknown, are religious shrines and TCPs. Sacred architecture located in places with traditional names or that are identified in historical traditions are also eligible under Criterion D for their ethnohistorical information potential and the embodiment of that information, which may be passed on from generation to generation by the affiliated or descendent community.

Shrines

Shrines are places where sacred power can be accessed, the presence of a divinity or spirit is manifested, a powerful *makai* (medicine person) is interred, or where communication with a spirit(s) to make petitions, ask for blessings, seek spiritual power, or learn songs takes place (Rea 1997b:89–96; Wright 2014:76–79). The Akimel O'Odham word for shrine is *hia'iñ*, which is the same for funerary feature or cemetery. A *hia'iñ* shrine often appears as a conically shaped rock pile. Other shrines may be identified as a house or *kii*, such as a *hevel kii* or wind house, where a powerful wind resides that can influence the weather and the outcome of events. This may appear as a cave, a rockshelter in a cliff, or an opening in the ground.

Other shrines range from natural landforms or mountains to isolated boulders, sometimes with rock art. Sacred architecture, especially platform mounds or *va'aki*, are shrines within a larger site, or a rockpile shrine might be placed on top of it in recognition of the spiritual power of the place and the siva*ñ* who lived there. Shrines can occur in association with prehistoric cemeteries, whereas other shrines may be isolated or stand alone on the landscape. Sacred mountains are very large shrines. In general, all shrines have the potential to qualify as TCPs under Criteria A and D as significant historical places where history is remembered and where traditional cultural practices are conducted. Criterion B may apply when the shrine is the interment site of an important religious leader. Criterion C may apply when a shrine embodies the form or character of a particular shrine type. For example, a *hia'iñ* of the *chepa*-type exhibits a formal structure consisting of a pile of stones with a small shallow depression or a stone *chepa* (mortar) at the top where offerings are deposited.

Cemeteries

The significance of cemeteries for the perpetuation of traditional indigenous culture cannot be overemphasized. As noted in NRHP guidelines for identifying and documenting TCPs, cemeteries ordinarily are not eligible for inclusion unless they "derive (their) primary significance from graves of persons of transcendent importance, from age, from distinctive design values, or from association with historic events" (Parker and King 1998:17) (see also National Register Bulletin 41) (Potter and Boland 1992). Historical Native American cemeteries, in general, are central to the memory culture of their descendants and provide a direct ancestral connection with the land. For the O'Odham, cemeteries are like shrines: they are *hia'iñ*, and they are sacred. The importance of deceased ancestors—the *O'Odham huhugam*—and the places

where they are interred is critical to maintaining and perpetuating spiritual, historical, and cultural ties with the land and the oral histories and traditions that pertain to these places and the surrounding landscape. Historic O'Odham cemeteries, therefore, qualify as eligible properties for the NRHP/ARHP and as TCPs. Other Tribal cemeteries retain a similar significance. This includes a Yaqui cemetery in Tempe (Guadalupe Cemetery) that recently has been listed in the NRHP and the THPR.

All historic, indigenous cemeteries may be eligible as TCPs under Criteria A and D in recognition of the traditional cultural practices and events associated with the ancestors and for the traditional knowledge they convey to descendants about their past. Certain cemeteries also may qualify for the NRHP/ARHP under Criterion B if particularly well-remembered historical persons are interred there, or under Criterion C where certain interments may be representative of a particular cultural practice. It should be acknowledged that unlike the O'Odham, the Piipaash traditionally cremated the physical remains and possessions of deceased ancestors (Spier 1933:300–304). However, during the last century and because of Christian influence, cemetery interment also is an accepted practice today.

Historical Villages

Historical ancestral villages represent another example of the ways in which Native American communities perpetuate the recognition and retention of traditional homelands, land legacy, and memory culture. Many of these sites are TCPs. Unlike most archaeological sites, historical villages are often remembered by name and have an association with important events, which can be established through ethnographic, ethnohistorical, or historical research. For the Akimel O'Odham, historical villages are often recognized in oral traditions and calendar stick records.

Archaeologically, ancestral villages can be distinguished by the presence of house foundations or associated artifact scatters, open plazas with a *vato* (ramada), a large *olaṣ kii* or council house, a well (*vavhia*) or reservoir (*vachkĭ*), chapels, and cemeteries (*hia'iñ*). Because of their role in perpetuating traditional territory, ethnogeography, land legacy, and oral history—particularly if they can be identified by their traditional name—historical villages may be eligible as TCPs under Criteria A and/or D. Distinctive architectural details or an association with specific historical persons and events also may support eligibility recommendations under Criteria B and/or C.

Rock Art

Prehistoric and historic examples of rock art—either pecked, etched, or ground into rock surfaces (petroglyphs), painted (pictographs), or both—abound in the American Southwest (Schaafsma 1980) and are particularly well known on some of the topographic landmarks of Tempe (Fertelmes et al. 2022; Loendorf and Loendorf 1995). Rock art can be beautiful to look at. However, rock art is used here in the technical or archaeological sense. Rock art production is a traditional practice that has ceremonial and ideological significance and is based on highly contextualized and symbolic principles that are culturally meaningful to affiliated or descendent Tribal communities (Wright 2014). For the O'Odham, images in rock art are *o'ohaḍag* (sacred writings or designs) (Darling 2019; Darling and Lewis 2007:136–137). Rock art sites and the *hohodi o'ohaḍag* (designs on rocks), therefore, are analogous to traditional songs and oral histories (Darling 2019; Darling and Eiselt 2017). Representational imagery and its meaning, no matter how abstract, is also closely

tied to the location or placement of rock art and, therefore, is highly sensitive to changes in the landscape or if the rock art is moved or relocated. Intentionally moving or defacing rock art for most, if not all, affiliated Tribes is regarded as desecration.

Not all rock art sites are shrines, but most ancestral O'Odham and Piipaash rock art sites are TCPs under Criteria A and D depending on the age, content, and context of each site. Criterion B also can apply when notable or historically important individuals are associated or even identified by name (Parker and King 1998:11). Criterion C also applies if certain rock art sites are unique in some way or are representative of a particular rock art style.

Traditional Cultural Properties in Tempe (A Sample)

Ultimately, it is the cultural group, descendent community, or affiliated Tribe that can speak directly to the significance of historical or cultural properties as TCPs and their role in the perpetuation of their living culture and its traditions. For this reason, communication with affiliated cultural groups regarding the identification and management of TCPs is an important component in project-specific addendum plans. The following are examples of TCPs located within the city of Tempe.

'Oidbaḍ Do'ag, Xwe Nykuuly, Ga Jaim Buyo (Tempe Butte)

Tempe Butte is a topographic landmark and mountain shrine that is considered culturally important by multiple, contemporary Tribes including the Akimel O'Odham, the Piipaash, and the Yavapai. The butte exhibits numerous petroglyphs (*o'ohaḍag*), a boulder shrine, grinding areas, bedrock mortars (*vavch'ed chechpa*), and artifact scatters that have been documented within the property boundaries (e.g., Kiser 2011; Loendorf and Loendorf 1995; Wright 2004). As noted above, the entire 59-acre footprint of Tempe Butte is listed on the NRHP under Criteria C and D. As a TCP, it also is recommended eligible under Criteria A and B. The butte is also listed in the THPR.

Tempe Butte has long been recognized in the oral histories of the Akimel O'Odham (Pima), Piipaash, and Yavapai (Kwiatkowski and Wright 2004; Winters Jr. 2012). The O'Odham name for the butte is '*Oidbaḍ Do'ag*, which Winters (2012:403) translates as "abandoned field," "field that is no longer good," and "field that has gone back to desert." A more literal translation is "dead-field mountain," which identifies the butte as the landform adjacent to the old fields. As the name implies, these agricultural lands became untillable, presumably during the late Hohokam archaeological sequence prior to AD 1450, when low flows in the Salt River were unable to supply the irrigation system with water. Food shortages in the larger villages likely contributed to widespread famine and social and political instability in the region. Attempts to restore the environment and social harmony culminated in attacks on the religious leaders, known as the *sivañ*, and the destruction of their ancestral ceremonial houses, the *va'aki*, during what some O'Odham describe as Elder Brother's war. These events are remembered in the traditional O'Odham oral histories, versions of which have been written down and published (Bahr et al. 1994; Lloyd 1911). The Yavapai Tribe also remembers Tempe Butte as *Ga Jaim Buyo* (Harry J. Winters personal communication 2022), which means the "Place of Famine" or "Where the people died of hunger," recalling the drought and its impact on the food supply.

These names are still used by the O'Odham and Yavapai to identify the land within Tempe. The Piipaash name for the city, *Xwe Nykuuly*, however, recalls a historical event that took place a century or more later that is documented in the *u'us hikvina*, the traditional O'Odham calendar sticks (Russell 1908:446, 46). Their name recalls an enemy raid (Yavapai and/or Apache) against the O'Odham in the 1850s. Four enemy raiders traveled south to the O'Odham villages on the *Akimel* (Gila River) to rustle livestock. A chase ensued to '*Oidbaḍ Do'ag*, where one of the raiders escaped across the *Onk Akimel* (Salt River), while the others fled to the top of the butte. The O'Odham assembled and surrounded the butte on all sides when they attacked and eventually killed the enemy hiding up above. *Xwe Nykuuly* in the Piipaash language means "where the enemy climbed up." Interestingly, the Mohave Tribe identifies the COT as *'Amat 'Ahwe 'Inak*, "Place Where the Enemy Was Still or Motionless or Sat Down" (Winters Jr. 2018:87). This appears to refer to the same event from the perspective of the raider who rapidly set up a small breastwork of rocks at the top of the butte to protect themselves from the approaching O'Odham. Today, the butte continues to be remembered in at least five songs from the traditional O'Odham song culture (Bahr et al. 1997; Darling and Lewis 2007). These songs describe other, more esoteric qualities of the mountain. Solliday (2004) further discusses the butte's significance as a cultural landscape and TCP among the O'Odham (see Stokes and Vargas 2008:1049–1050).

Additional details of the archaeology of Tempe Butte also contribute to its status as a TCP; these are discussed above in the *Overview of Archaeological Resources in Tempe*. As a TCP, '*Oidbaḍ Do'ag* is eligible under Criterion A for its continued association with traditional knowledge, song culture, and ceremony, as well as for the abundance of features including *o'ohoḍag, chechpa,* and multiple shrines located there that are generally acknowledged by the Akimel O'Odham and Piipaash as TCPs. The butte as a TCP is also eligible under Criterion A and Criterion D based on ethnohistorical information that can be derived from traditional histories and the place names of four separate Tribes (O'Odham, Piipaash, Yavapai, and Mohave). Criterion B may also apply regarding the identity of the combatants involved in the battle that took place there in the 1850s as well as the O'Odham calendar stick keepers who memorialized this history in their *u'us hikvina*. Finally, its listing under Criterion C applies to aspects of the petroglyph assemblage with reference to the variety of rock art styles represented on the butte as well as the specific character and type of an isolated boulder that has been identified as a shrine, which has been invested with rock art as well.

'Onk Akimel (Salt River)

Certain rivers that have had, and continue to have, significant roles in the history and culture of the Akimel O'Odham and Piipaash are TCPs. Among them are the Gila River (in O'Odham, *Akimel* or sometimes *Kerli Akimel* or old man river) (Bahr et al. 1994), the Colorado River (*Veg Akimel* or red river), and the Salt River (*Onk Akimel*) that passes through Tempe (Winters Jr. 2012:42). *Onk Akimel* is a direct translation of the English name. Nevertheless, as a traditional O'Odham name, it is an excellent example of naming practices that rely on a descriptive term and the context or an adjective to distinguish a place—or body of water—from others. All rivers are *akimel*, water that runs or moves. In this way, *Akimel O'Odham* means the river people or people who live alongside water that moves. This is the name they use to distinguish themselves from other O'Odham who live primarily in the desert. It expresses a shared history, lifeway, and their unique relationship with flowing water and irrigation. *Onk Akimel O'Odham* is the name used to identify the Salt River Pima, most of whom today reside in the SRPMIC.

The Queen Creek to the south of Tempe is also an O'Odham TCP that behaves like an *akimel*, although sometimes it flows underground or spreads out like a delta, known as a *vo'oshañ*. Akimel O'Odham recognize a shared history with the *Aangam O'Odham*, who once lived along the Queen Creek and who merged historically with the Akimel O'Odham living on the Salt and Gila rivers or had to move south to Tohono O'Odham territory before the arrival of Euroamericans. Today, the *Aangam O'Odham* remember the land on the banks of the Queen Creek north of the Santan Mountains as a part of their traditional homelands (Darling 2004). The Gila and Salt rivers and the Queen Creek are also distinguished by the fact that they flow from east to west, a directional principle that reflects the journey of the sun from sunrise to sunset and is an important part of the Akimel O'Odham worldview (Rea 2007:229–231).

Locations along rivers or on riverbanks may also be TCPs. For example, the confluence of the *Onk Akimel* (Salt River) with the *Akimel* (Gila River) downstream from Tempe is called *Ha Kwiin* (to have whirlpools) in Piipaash. For both Tribes, the confluence is a cultural place and TCP that is remembered in traditional songs, oral history, and traditional cultural practices. Specific locations along the Salt River in Tempe also contribute to its status as a TCP within the city limits. These include archaeological sites located on the riverbanks and associated riparian habitats and the plants and animals that live there, some of which may be traditional resources. Bedrock outcrops or landforms on riverbanks (or underneath the river) may have created conditions, traditionally, that were conducive for river crossings, fishing, or the placement of brush dams or canal headgates for diverting or managing water. These also contribute to the status of the river as a TCP. The place where the Salt River passes '*Oidbaḍ Do'ag* (Tempe Butte) may have at one time exhibited elements of all these. River crossings also are places where travel routes converge, and people assemble. '*Oidbaḍ Do'ag* continues to be acknowledged by elders as a landmark for orientating travel. Future archaeological surveys and ethnohistorical research may identify shrines or landmarks at these locations where spiritual assistance was sought to assist with the dangers of crossing the river and for maintaining river flows that at times may be too low for successful irrigation or too high and cause flooding.

The lower Salt River, where it passes through Tempe, is eligible for the NRHP as a TCP under Criteria A and D for its significance to ethnic identity, worldview, and traditional cultural practices. While the river is itself a TCP, management considerations rely on the particular locations and associations of the river with features along its riverbanks that may be associated with natural resources, cultural traditions, archaeological sites and features, or natural landforms such as high-water tables and bedrock outcrops.

Nanakmel Kii, Qmpanyk Nyiva (Bell Butte)

Bell Butte has been the focus of repeated archaeological investigations since the late 1800s, and at least 10 cultural properties have been identified in association with this topographic landmark. The cave site at Bell Butte (AZ U:9:59[ASM], AZ U:9:13[PG], Mesa:4:4[GP]) is the most notable feature of this cultural property. Other cultural properties that have been identified include one prehistoric and one historical artifact scatter (AZ U:9:76[ASM], AZ U 9:77[ASM]); one prehistoric canal verified through subsurface testing (AZ U:9:75[ASM]; AZ U:9:12[PG]); and possibly relict portions of the historic San Francisco/Tempe Canal. Fertelmes et al. (2022) is currently the most comprehensive study and includes an ethnographic overview

that recommends consolidation of the multiple associated site designations into a single site, AZ U:9:59(ASM).

Fertelmes et al. (2022) recorded a total of 14 features and six artifact observations within the recommended AZ U:9:59(ASM) site boundary. These include both historical and prehistoric artifacts. The 14 features include a ceremonial cave, 11 petroglyph panels or locales, and two clusters of bedrock mortars. After Frank Hamilton Cushing's work in 1888 for the Hemenway Expedition, no artifacts or cultural deposits remain within the cave (Haury 1945). Most of the rock art recorded at Bell Butte is characteristic of the Gila Style, which is associated with the Hohokam cultural tradition. Geometric designs or elements are most common, followed by anthropomorphic and zoomorphic figures. At least one petroglyph is atypical of the Gila Style and may be a historic O'Odham representation of a sacred *kii* or house that is associated with the ceremonial cave.

Ethnographic investigations provided in Fertelmes et al. (2022) establish this topographic landmark as an Akimel O'Odham TCP based on its traditional indigenous name (*Nanakmel Kii*, its association with O'Odham traditional religious practices, and the presence of bedrock mortars (*vavch'ed chepa*) and petroglyphs (*hohodi o'ohodag*). Offerings and religious objects recovered from the ceremonial cave by the Hemenway Expedition in 1888 are representative of specific ceremonies and spiritual associations, including the *Navichu* deity, which further solidifies the close descendant relationship of the Akimel O'Odham with *Nanakmel Kii* as a sacred place. This status is further supported by the identification of the butte in at least two songs in the traditional O'Odham song culture. Piipaash also acknowledge the spiritual importance of Bell Butte especially the ceremonial cave in their historical traditions. Their name for the butte is *Qmpanyk Nyiva*, which like *Nankamel Kii* also means "Bats' Home". In spite of their unique and very different historical traditions, mutual recognition of Bell Butte's traditional cultural significance contributes to the shared group identity of the O'Odham and Piipaash that also pertains to a number of other TCPs (including Tempe Butte). This further benchmarks the importance of these places in the early nineteenth century when the Piipaash first migrated to the region in significant numbers and became close allies with the Akimel O'Odham.

Nanakmel Kii/Qmpanyk Nyiva is recommended eligible for inclusion in the NRHP as a TCP under Criteria A and D for its continuing recognition by the Akimel O'Odham and Piipaash as a sacred place and mountain shrine, for its significance in the perpetuation of traditional oral history and song culture, and for its role as a topographic landmark in place-based and geospatial systems of knowledge. Criterion C also applies in reference to the rock art assemblage, particularly the historic O'Odham *kii* representation associated with the ceremonial cave.

Guadalupe Cemetery

The Guadalupe Cemetery is a historic Yaqui cemetery situated on 5 acres in what is now the COT but was previously the location of the original Yaqui settlement of Guadalupe. The cemetery, which contains hundreds of gravesites, has been continuously used by Yaqui and Hispanic populations since the late nineteenth century to the present day. Guadalupe Cemetery is a TCP listed on the NRHP under Criteria A and D. It is also listed on the THPR (Hoerig 2022).

During the last quarter of the nineteenth century and into the early twentieth century, many Yaqui people moved north to join family members living in what is now Arizona to escape genocide under the Mexican government and take advantage of employment opportunities with irrigation companies, farmers, and ranchers (Spicer 1962). On February 1, 1898, Sylvester Roche, a homesteader in Tempe, transferred 5 acres of his property to the Catholic Church (Glaser 1999:21). That land would become the location of the Guadalupe Cemetery. The church encouraged Yaquis to settle on the land and eventually, the community built an adobe church, many homes, and ramadas. This settlement eventually expanded beyond the 5-acre parcel. In the early 1900s, the completion of the Roosevelt Dam on the Salt River expanded irrigation and brought higher property values to the valley. Farmers and land speculators compelled the Catholic Church to move the Yaqui community a short distance to the southwest to what is now the modern-day Town of Guadalupe. The Yaqui community continued to use the church until a new church was built in 1916 within the Town of Guadalupe (Glaser 1999:26). The cemetery, however, has continued to be the final resting place of the original founders of Guadalupe, community and family members, and their descendants (Hoerig 2022).

Gravesites of ancestors are sacred to the Yaqui, and cemeteries are important heritage places. Guadalupe Cemetery is a living place that provides spatial grounding for Yaqui communities, especially that of the Town of Guadalupe and the Pascua Yaqui Tribe (Hoerig 2022). The Yaqui commemorate the souls of deceased ancestors annually. For them, the *Animam Mikwa* (All Soul's Celebration) begins on October 1 and continues through Día de los Muertos (Day of the Dead) on November 1 and 2 (Darling et al. 2015; Painter 1986). Community celebrations include Matachine dances, originally documented at Guadalupe Cemetery in the early 1900s (Coolidge 1909). Per Yaqui cultural tradition, personal items and candles are placed on graves, and many of the graves within the cemetery are adorned with handmade paper flowers (Hoerig 2022).

While the cemetery has not been subjected to archaeological study, the cemetery property is centrally located within AZ U:9:48(ASM), a large Hohokam village that included a platform mound and ballcourt (Chenault 1993; Wilcox et al. 1989) (see site description provided above). The platform mound was still visible when the cemetery was established adjacent to it. While not considered in the identification of the Guadalupe Cemetery as a Yaqui and Hispanic community TCP, the Hohokam village site has been determined NRHP-eligible under Criterion D and is recognized for its sacred architecture as a TCP by affiliated Tribes and descendent communities, including the Akimel O'Odham and the Piipaash.

Guadalupe Cemetery is included in the NRHP as a TCP under Criterion A for its continuing significance to the Pascua Yaqui Tribe and the community of Guadalupe as an active, traditional indigenous cemetery, which also identifies the site of their original church and townsite. The annual celebration of the *Animam Mikwa* and Dia de los Muertos at this historic cemetery reaffirms and perpetuates family ancestry, celebrates local ties of the community to the land, and the spiritual connections of ancestors and descendants. The cemetery is also included under Criterion D based on ethnohistoric and historical connections that reaffirm Yaqui land legacy in Tempe among the descendants of the original Yaqui-settled Town of Guadalupe and the historic Yaqui Community.

RESEARCH DESIGN

Prehistoric and historical resources are anticipated for many portions of Tempe. The research design consists of a series of research themes and associated research questions intended to guide the evaluation and documentation of archaeological resources on properties in Tempe. The themes presented below are applicable to a wide range of cultural resources. It is anticipated that these research themes and questions will function as a starting point for the development of project-specific research questions for specific locations and resources and build upon the themes and questions below based on recent research, resource-specific data potential, and project constraints. Project-specific themes and questions shall be documented within project-specific addenda.

Prehistoric Research Themes

This section introduces general research themes for investigating prehistoric archaeological resources in Tempe. These themes are broadly defined and accommodate the range of prehistoric sites and feature types that may be investigated throughout the city. Specifically, the prehistoric archaeological resources are expected to relate to Hohokam habitation areas, resource procurement and processing areas, and agricultural complexes, including both irrigation farming and upland farming. Five themes are presented below, with discussion and representative key research questions included: Chronology and Occupation Sequence; Settlement and Land Use; Subsistence and Specialized Production; Exchange and Interaction; and Water Management.

Chronology and Occupation Sequence

Establishing an appropriate temporal framework is critical for all archaeological research to situate cultural resources within specific chronological and spatial settings. A well-defined chronology can assist in identifying changing relationships among people, places, and the natural landscape, and it provides a basis for interpreting long-term processes of cultural, social, and ecological change. An understanding of the chronological sequence will facilitate research concerning diachronic changes or continuity in site structure, land use, regional interaction, and other research themes.

Key research questions may include:

- What is the temporal association of the cultural resource(s) being investigated for the project area? What indicators are temporally diagnostic of a specific time period or archaeological phase?
- Are multiple temporal components or occupations present? If so, what is the duration of each episode and is the occupational sequence continuous or intermittent? Does site use change over time?
- How does the chronology of the resource(s) compare with nearby sites and the broader regional context or culture area?
- Is there evidence of Archaic, Protohistoric, and/or historical O'Odham occupation (e.g., Fertelmes and Hackbarth 2022)?

Settlement and Land Use

This research theme focuses on settlement patterns and use of space that can be tailored based on the size of the project area and type(s) of cultural resources being investigated. At the broadest scale, regional patterns of relationships can be examined among settlements and land-use areas (e.g., Mills, Clark, et al.

2013; Mills, Roberts Jr., et al. 2013; Peeples et al. 2016). Intrasite analysis examines the spatial layout of components within a settlement, including arrangements of features such as rooms and structures, compared with extramural features and activity areas within a residential unit or group (e.g., a pithouse or courtyard group) (J. B. Howard 1985; Wilcox et al. 1981). The spatial distribution of features within archaeological sites also is examined in relationship to landscape features, resource procurement/processing areas, irrigation features (e.g., canals, reservoirs), and agricultural features (e.g., field houses). Considering these patterns at the intrasite level contributes to the identification of patterns pertaining to household and intra-household activity areas, and facilitates analysis of broader regional scale questions related to land use and social interaction (Feinman 2011, 2017).

Regional-scale research questions consider the social, political, and economic relationships of larger and smaller settlements within irrigation systems (as referenced above in the *Culture History* section) and, more broadly, in the lower Salt River Valley and the Phoenix Basin (see Caseldine 2020; Woodson 2016). Spatial arrangements are influenced by cultural perceptions of landscapes, as well as regional and interregional relationships. Social, demographic, and economic changes, including large scale population movements and alterations in exchange networks, can affect shared perceptions of cultural landscapes and settlement patterns. Large focal village sites may exhibit evidence of sacred architecture including ballcourts, platform mounds, ceremonial rooms or big rooms (known by the O'Odham as *va'aki*), formal central plazas, and capped mounds. Platform mounds were a Classic period expression that initially exhibited large mounds of earth that might have one or more adjacent *va'aki*. Over time, walled compounds were constructed around platform mounds, with a *va'aki* constructed on top of the platform mounds; other rooms might be built along the mound's perimeter. Consequently, platform mounds also are recognized as *va'aki* by the O'Odham. *Va'aki* are referenced in multiple O'Odham song cycles, including the Oriole and Ant songs (Darling and Lewis 2007, 2019; Ravesloot et al. 2009).

Key research questions may include:

- What activities are suggested by the presence of contemporaneous feature types? What is the spatial relationship of habitation features, extramural features (e.g., pits, refuse features), and agricultural features within or around the site?
- Are specific activity areas indicated by the arrangement of feature types? Is there patterning in household versus communal feature locations, if present?
- Is there evidence of diachronic change in household or site organization?
- How does evidence of prehistoric occupation and settlement inform about patterns of land use on a regional or interregional scale? How do these findings compare with other sites in the vicinity of the project area?
- How did the natural (terrain, water, resource zones) and social (density and distribution of contemporaneous settlements) landscape influence settlement and land use?

Research questions specific to sacred architecture may include:

- Can the cultural remains of sacred architecture provide an indication of form and function (e.g., platform mound, "ceremonial room," or compound)? Can the exposed walls of the structure provide any insight regarding the massing and morphology of the structure?

- What is the relationship of the sacred architecture with previously documented compounds (Fox et al. 2020:6, 10, 17; Stuart 2010:2351–2353) and features at nearby sites? If identified, how do other features relate functionally and temporally with the documented sacred architecture?
- What was the visual relationship of the sacred architecture to prominent landscape features like Tempe Butte (‘*Oidbaḍ Do’ag*) and Bell Butte (*Nanakmel Kii*)? On a broader scale of interaction, how does the sacred architecture identified relate to traditional O’Odham views of movement within the Salt River Valley landscape (notably the Oriole and Ant song cycles) and previously identified compounds and features?

Additional questions may be identified through consultation and ethnographic studies with descendant communities, as these resource types are considered TCPs.

Subsistence and Specialized Production

This theme focuses on economic production and resource provisioning, including specialized subsistence and craft production. For subsistence-related production, a variety of irrigation and non-irrigation techniques were employed to manage water for agricultural purposes (see Water Management research theme below). Tempe is located around the Salt River within the extensive area of Hohokam canal systems which provided access to canal-irrigated fields, floodwater agricultural fields, and riparian resources. Proximity to piedmont and upland areas enabled access to dry farming used to encourage agave and various cacti (Crown 1984; Foster et al. 2002). These methods facilitated access to cultigens (mainly maize, beans, and squash), as well as various encouraged and semi-domesticated plants (e.g., agave), wild plants (e.g., cactus, mesquite), and small and large game. Agricultural and habitation areas further encouraged plants and animals that favor these disturbed habitats, creating additional opportunities for plant gathering and hunting small game.

In addition to subsistence resources, Hohokam settlement groups produced craft items such as flaked and ground-stone tools, bone implements, ceramic items, and personal ornaments using local materials. Some items such as flaked stone and bone tools may have been produced by and for local users, while some items such as red-on-buff pottery (Abbott 2009; Abbott, Smith, et al. 2007; Abbott et al. 2001; Van Keuren et al. 1997) and vesicular-basalt ground stone tools (Fertelmes 2014) required specialized production in specific locations for regional distribution. In addition, some local production may have occurred using nonlocal materials such as obsidian, minerals, and marine shell. Acquisition of items either in raw material or finished form provide information regarding a specific site’s participation in local or regional exchange networks.

Key research questions may include:

- What kinds of subsistence activities would have been possible in the project area? What types of domestic and/or wild plants and animals were procured, prepared, and consumed? Do these subsistence strategies change over time? Can an annual cycle of subsistence activities be reconstructed for these occupations?
- What types of local resources and locally produced tools and craft items occur within the project area? What are the contexts of manufacture, use, and disposal of these objects? Do these patterns change over time?

- Where within the project area is local craft manufacturing occurring? Is there evidence of production activities in communal and public spaces?
- How do patterns of subsistence and specialized production in the project area compare to those of nearby sites and broader regional patterns?

Exchange and Interaction

While the previous research theme primarily focused on local provisioning, this section focuses on nonlocal exchange and interaction. Some goods or raw materials were manufactured or procured by craft specialists in specific locations and obtained by consumers in other locations though some form of exchange. This theme can be investigated via studies of raw material sources and analyses of nonlocal items such as obsidian, marine shell, and turquoise to determine the direction and degree of exchange through time. In addition, assessment of local ceramic production and trade of both local and intrusive wares is a significant research avenue for Salt River Valley communities.

Ceramics provide a crucial line of evidence for studying regional scale exchange. Within the Phoenix Basin, ceramic evidence has been used to study patterns of inter-community social relationships, especially among communities located along a shared canal system (Abbott 2000). Abbott (2009, 2010; Abbott, Smith, et al. 2007; Abbott, Watts, et al. 2007) argues that during the Preclassic period (ca. AD 750–1125/1150), ceramic vessels were produced in a limited number of locations and exchanged though an extensive marketplace-based system centered on ballcourt villages, a system that peaked during the middle Sedentary period (AD 1020–1070/1080). At that time, most decorated and plain ware pottery used in the Phoenix Basin was manufactured by middle Gila River Valley producers (Kelly 2013). Abbott (2000) argues that during the Classic period (ca. AD 1125/1150–1400/1450) undecorated pottery was increasingly locally manufactured and exchanged among different settlements within the same canal system. This shift from widespread to localized community interaction corresponds to the apparent reorganization of Hohokam economic and social relationships that took place during the Sedentary-Classic period transition.

Procurement of ground stone tools and raw materials likely employed both direct and indirect exchange methods. Although households probably supplied many of their own ground stone tools on an expedient basis using locally available materials, Fertelmes (2014:292–301) has argued that a few specialist communities located close to prominent vesicular basalt sources manufactured vesicular basalt ground stone tools in the Salt-Gila Basin. Specialized production and exchange of vesicular basalt ground stone tools may have followed Abbott's (2009, 2010; Abbott, Smith, et al. 2007; Abbott, Watts, et al. 2007) model of pottery manufacture and exchange in the Phoenix Basin; however, Fertelmes (2014:292–293), avers that finished ground stone tools were acquired through either workshop procurement or from local distributors who specialized in acquiring these materials for the community. He suggests that this pattern persisted from the Preclassic through the late Classic period.

Although most lithic tools were manufactured on an expedient basis using locally and readily available raw materials, some nonlocal lithics materials were used, specifically obsidian. Obsidian was procured from several nonlocal sources throughout Arizona, particularly during the Preclassic period (Shackley 1988, 1995, 2005), and temporal variation for obsidian source use have been identified in the Phoenix Basin (Loendorf

2019; Loendorf 2010; Rice et al. 1998). Other exotic mineral artifacts are encountered at sites in the Phoenix Basin, including turquoise, chrysocolla, malachite, and similar blue minerals. Turquoise, malachite, and azurite occur in geological deposits along Pinal Creek in the nearby Globe-Miami area to the northeast, and along the Salt River; chrysocolla occurs in deposits to the south along the Gila River near Kearny (Rice et al. 1998:124), among other areas in the region.

The Gulf of Mexico represents the primary source of marine shell for jewelry recovered from Phoenix Basin sites, with a considerably smaller contribution from taxa associated with the California coast. The route used by the O'Odham for salt pilgrimages from the Phoenix Basin through southwestern Arizona to the Gulf of California also was likely associated with the procurement of ceramic tempering materials, obsidian, turquoise, and shell, either directly or indirectly through exchange (Gregory 2011). Beginning with the late Sedentary and increasing during the Classic period, raw shell was more frequently imported by the Hohokam, and bracelets and pendants were manufactured locally at large sites, particularly those located within and around the Phoenix Basin and at some loci within complex sites in the Tucson Basin (Bayman 2007; Gregory 2007; Gross and Stone 1994; Haury 1976; A. V. Howard 1985; Howard 1987, 1993; Hutira 1995; McGuire 1985; McGuire and Villalpando C. 2007; Vokes 1987, 1994, 1995). However, significant local shell manufacturing has been identified at sites within Tempe, including at AZ U:9:165(ASM) (Gregory 2011).

Key research questions may include:

- What types, quantities, and forms of nonlocal resources are present? What are the contexts of use, curation, and disposal of these objects?
- How were the site occupants situated within the broader regional economy? What was the type and scale of the exchange network for different goods and materials?
- Can changes over time in patterns of local, regional, and long-distance exchange relationships be detected?

Water Management

Prehistoric water management in the Salt River Valley is a significant research theme for cultural resources in Tempe by helping to understand long-term human-ecological relationships. Turney's (1929a) map represents the first detailed effort at recording Hohokam irrigation systems in the lower Salt River Valley, but the effort was limited to what remained following the Classic period after older canals had been buried or destroyed. Later maps by Midvale (1968), combined with more recent canal investigations, have provided a more complete understanding of prehistoric irrigation along the lower Salt River (Caseldine 2020; Henderson 2015, 2019; Howard 1991 [1992]).

Caseldine's (2020) dissertation identified multiple canal systems in Tempe, the largest and earliest of which was the Sedimento System, established in the Pioneer period and operating through the Colonial period. After disuse of the Sedimento System between the late Colonial period and early Sedentary period following an extremely large flood event, the Riverview System was constructed and intensified through the Classic period, eventually extending within 10 km of GR-898/Snaketown, located along the middle Gila River. While the Sedimento and Riverview systems were the most far-reaching prehistoric water control systems in Tempe, servicing three areas around major sites like AZ U:9:165(ASM)/La Plaza (north zone), AZ

U:9:48(ASM)/Los Hornos (central zone), and AZ U:9:116(ASM)/Los Guanacos (south zone), other systems also were developed for irrigating locations beyond the reach of those networks (Caseldine 2020:122–134). The Los Muertos System is believed to be a late development in the irrigation system of Tempe, likely established during the Classic period. The system followed the Mesa terrace until reaching AZ U:9:214(ASM)/Las Acequias and serviced widely dispersed settlements including AZ U:9:214(ASM)/Las Acequias and AZ U:9:56(ASM)/Los Muertos, supporting significant population increases at those locations through the late Classic period (Caseldine 2020:134–140).

Canal System 2 originates in Tempe, with its intake located on the north side of the Salt River between Papago and Tempe buttes where a bedrock construction influences the upstream channel dynamics (Henderson and Morgan 1989:Figure 2.1; Lee 1905:121–125; Steinbach 2018). Although the critical intake position for the system was established in Tempe, the sites serviced by the system were located north of the Salt River in Phoenix and included settlements such as AZ T:12:36(ASM)/Casa Buena, AZ T:12:256(ASM)/Grand Canal Ruin, AZ T:12:1(ASM)/La Ciudad, and AZ T:12:10(ASM)/Las Colinas. Large-scale irrigation in Canal System 2 did not occur until the late Pioneer period, with dramatic growth during the Colonial period and sustained operation and expansion throughout the Sedentary and Classic periods, and a massive flood that ended operation of the system in late AD 1300s (Caseldine 2020:162–173).

Over 2,000 years of irrigation agriculture have impacted local ecology, leaving behind traces on the landscape in form of irrigation canal structures, water catchment features, and irragric soils developed through cycles of repeated inundation with muddy water and accumulation of fine-grained sediment (International Union of Soil Sciences [IUSS] Working Group 2015; Woodson et al. 2015). Historically, the area south of Tempe was impacted by soil salinization due to shallow water tables, which allowed accumulation of irrigation silt and clay, making soils less permeable and preventing leaching of excessive salt accumulations (Means 1901). It is possible that this same challenge was experienced by the Hohokam in parts of the Salt River Valley during the Classic period (Hill et al. 2015). Cultural resource investigations have the potential to increase our understanding of Hohokam water control system development, subsistence strategies, and environmental impacts, and further research can contribute important information regarding what traditionally was considered a single hydraulic entity (i.e., Turney's Canal System 1) and has since been determined to represent multiple systems based on temporal and service area differences (Caseldine 2020).

Key research questions may include:

- What types of features are associated with the irrigation systems, including main channels, distribution canals, and laterals?
- What evidence is there for seasonal use of canal(s)? Re–excavation? Cleaning? Abandonment?
- What other types of water control features (e.g., reservoirs) are present?
- When did the canal(s) function and what was the use history over time?
- Are irragric soils present? Can we reliably identify potential locations of agricultural field areas? What can they tell us about the history of irrigation and soil condition in the project area?
- What is the water-carrying capacity and potential irrigable area of the canal(s)?

- How do documented canal components compare with projected alignments illustrated on known irrigation system maps?

Historic Continuity Research Theme: Akimel O'Odham, Xalychidom Piipaash, and Pascua Yaqui Occupation in Tempe

As noted above, in 2021, the City of Tempe, under Resolution No. R2021.08, recognized the lands that comprise present-day Tempe as culturally affiliated with the O'Odham (Pima), Piipaash (Maricopa), and their ancestors. The resolution states that "the land continues to be spiritually connected to the Salt River Pima-Maricopa Indian Community and the Gila River Indian Community" represented by "confederations of two unique groups with their own languages, customs, cultures, religions, and histories; the O'Odham and Piipaash", and that both are "oral history cultures". This resolution also acknowledges that the "landscape is sacred" and "central to their way of life and their self-definition." This responsibility also applies to the other Native communities or Tribal organizations that have historical and cultural affiliation within the city (City of Tempe 2022).

Mounting archaeological evidence for Akimel O'Odham (*Akimel Au-Authm*, River People) presence in Tempe during the Protohistoric and Historic periods is revealing new insights regarding the historical legacy of descendant communities and the theme of cultural continuity (Fertelmes and Hackbarth 2022; Garraty and Steinbach 2021). The descendants of the *Huhugam* who continue to reside along the Salt and Gila rivers from the end of the Classic period through the present are the Akimel O'odham. While largely concentrated on the middle Gila River in the early Historic period, occupation by extended families also occurred on the Salt River near prominent landmarks like Tempe Butte (*'Oidbaḍ Do'ag)* and eventually culminated in the creation of the SRPMIC reservation in 1879, where they were also joined by the Xalychidom Piipaash. The O'odham and Piipaash never left, and yet their changing historical relationship with Tempe, including struggles over land and water and the protection of their ancestors and traditional cultural places, continues to be underappreciated and misrepresented (Comeaux 1991:244; Fontana 1958:92; Jones 1960:307; *Salt River Herald* 1878:November 2, page 3; Zarbin 1997:61). The Pascua Yaqui Tribe—including Tribal members who reside in Guadalupe, Penjamo, and Hightown—also maintain ties with their ancestral homeland encompassing Tempe and the Salt River Valley, where they have lived continuously for more than a century (Glaser 1999:21).

Oral traditions of the O'Odham, the Piipaash, and the Pascua Yaqui recall places on the land, such as natural landforms and water sources, archaeological sites, ecological knowledge, traditional medicine, cultural practices, and historical traditions. Investigations in Tempe may provide pertinent data for Protohistoric and Historic periods, documenting cultural continuity, the impact of Spanish, Mexican, and Euroamerican occupation impacts on traditional lifeways, and the changing historical relationship of these communities with later Tempe settlers. Key research questions may include:

- Is there evidence for the late Protohistoric to early Historic period transition in the project area? Is there evidence of material culture related specifically to the Akimel O'Odham, Yaqui, and Piipaash (e.g., pottery and other materials)?

- Do material correlates of human activity, such as domestic architecture layout and spatial organization, funerary practices, and material culture reflect the traditional cultural practices of descendent communities?
- Can patterns of settlement and material culture be related generally and/or specifically to social and cultural dynamics identifiable in the traditional history and ethnography of descendant communities?
- What archival information is available regarding historical agricultural and occupation/residential locations, and is there corroborating information in the archaeological record? How do the archaeological data for early historic occupation compare with historical accounts in the literature?
- Do cultural remains identified provide an indication of how Euroamerican culture influenced lifeways of Native American communities?

Historical Research Themes

This section introduces broadly defined research themes and associated historic contexts for investigating historical archaeological resources within the municipal limits of Tempe. Like the prehistoric themes above, these themes are tailored to the types of historical archaeological resources anticipated within the Tempe city limits. These resources would conceivably be identified in multiple settings, including urban residential neighborhoods, commercial and public spaces, and rural and undeveloped farmlands. The Tempe Multiple Resource Area (MRA) Update defined eight contexts as significant to the historical development of Tempe: 1) Community Planning and Development, 2) Education, 3) Commerce, 4) Industry, 5) Tourism, 6) Agriculture, 7) Ethnic Groups, and 8) Architecture (Ryden Architects 1997:11–23). The themes below incorporate the bulk of these contexts as they relate to the investigation and evaluation of historical archaeological resources.

In addition to the research themes and contexts summarized below, users of this document are also encouraged to review and, as appropriate, incorporate elements from the various Arizona SHPO historic context studies and *Historical Archaeology in Arizona: A Research Guide* (Historical Archaeology Advisory Committee 2013), all of which are available for download on the SHPO website. The Tempe HP Plan (City of Tempe 2022) includes an annotated bibliography that lists and summarizes a number of previous archaeological, architectural, and historical studies completed across the city over the last five decades.

Land Use, Settlement, and Development

This theme focuses on both the material properties of historical features (e.g., construction styles, raw materials) as well as the spatial relationships among elements of the historical built environment that are more than 50 years of age and have been abandoned and are no longer in use, including remnants of buildings, outbuildings and structures (e.g., privies and corrals), extramural activity areas, open space, and circulation and infrastructure (e.g., roads, railroads, trails, utilities, canals/ditches, walls/fences). Prior to the construction of transcontinental railroads and branch lines to Tempe, adobe construction was common in houses and outbuildings. After about 1890, milled lumber and brick were increasingly used in buildings, due largely to the expansion of commercial and industrial markets by railroad development. The use of alternative construction materials was also influenced by building standards that were implemented in part by the widespread surveys of American cities for insurance purposes, notably the Sanborn Map and Publishing Company (later known as the Sanborn Perris Map Company, Ltd.).

Comparisons of cultural remains and contemporary elements of the built environment with those of similar projects can contribute to our knowledge of the historic landscape and how it changed over time in Tempe. Both archival data and archaeological data should be used to characterize and potentially quantify elements of the built environment. Relevant research questions for this theme may include:

- What was the historic land use of the project area through time, including agricultural, industrial, residential, and any other activities known to have occurred in the project area? How did this development impact or influence the surrounding community?
- What were the construction methods and materials used for the features and building remnants within the project area? How do construction materials, style, and technologies change over time?
- Were notable individuals and landowners affiliated with the development of the project area? Do archaeological and material remains provide any indication of this affiliation?
- How did transportation corridors (i.e., roads, highways, railroads) influence the historical development of the project area?
- How do archaeological data compare to information gathered through archival research?
- What refuse disposal practices were used? Did these practices change over time?
- How do the results of the archaeological investigations change our view of the project area's significance within the context of Tempe's development?

Cultural Interaction and Identity

This research theme focuses on how communities with specific social and cultural identities interacted with other cultural communities and how these interactions shaped the way in which communities adapted and reacted to Tempe's culturally diverse landscape. Mexican and Mexican American communities were also integral in Tempe's growth, boasting at one point the largest Hispanic community in the Salt River Valley. A number of these barrio communities were occupied through the twentieth century, though many were razed in the post-World War II era, succumbing to urban expansion (City of Tempe 2022:Appendix H; Solliday 1993; Vinson 1991a). African American and Asian American residents in Tempe likewise persevered through the late Historic period, despite decades of racial discrimination and segregation (Smith 2013; Solliday 1993; Spicer 1984, 1986). Research questions related to this theme may include:

- Are data present that can be used to define ethnic use or occupation of the project area (e.g., material goods and other materials, archival records)? Do the material expressions of these identities change over time? Were social identities and cultural affiliations affected by changing demographic, economic, or social conditions?
- Do archaeological and material remains reveal anything about the socioeconomic association of the residents?
- What do the range(s) of historical artifacts, food remains, and other materials indicate about cultural affiliations within the project area? Did these identities and affiliations change over time?
- What kinds of foods and goods were consumed in the Mexican American barrios occupied historically across the city? Do the project results suggest intra-community consistency or variability in food preferences and eating patterns, especially within the barrios?

Economy and Exchange in the Historic Period

Agriculture was the primary industry for early Tempe settlers and homesteaders. The Hayden Flour Mill and Charles Hayden's merchandise enterprise were central to the early success of Tempe. Farmers grew a variety of crops in the territorial period, including grains such as wheat, barley, and alfalfa. Prior to ca. 1887, goods and products were acquired by Charles Hayden and other freighters who established extensive trade networks between regional centers like St Louis, Missouri, San Francisco, California, and Guaymas, Mexico. The completion of the Southern Pacific Railroad (1880) and its branch line, the Maricopa & Phoenix Railroad (1887), enhanced Tempe's economic viability. Crops and other produce harvested by Tempe's farmers were distributed to other markets across the country. Importantly, a much wider variety of food and other products were now available for consumption and purchase.

As the twentieth century progressed, additional transportation corridors (automobile roads and highways) were established, coinciding with technological advances in the manufacture of material goods that ushered in an era of mass production and industrial growth, which has continued unabated into the modern era. This theme seeks to address what the cultural and material remains can tell us about how economic activities changed over time. Research questions related to this theme may include:

- Were natural resources historically exploited, including flora and fauna? Did occupants of the project area use wild foods more frequently than domesticated resources?
- How did the development of transportation corridors (i.e., railroads and highways) influence the availability and diversity of material goods? Do the items reflect local manufacture and consumption or broader regional patterns of exchange?
- How did the mass production and distribution of Euroamerican goods in the twentieth century impact traditional consumption patterns and the material culture of other cultural communities?

PROJECT INITIATION

The following is a description of the standard methods and procedures to be employed during cultural resource investigations conducted under this plan. Some projects might require deviations from these standard procedures, however, which will need to be described and justified in project-specific addenda to this plan.

Project-Specific Addendum Plans

A request to use this plan must be submitted to and approved by the HPO prior to the preparation of a project-specific addendum. The addendum plans should be tailored to address the specific project and any deviations from, or amendments to, the methods, procedures, and research design outlined in this plan. The addendum plans can be prepared using a brief letter format addressed to the HPO. Minimally, the addendum plan will address the following:

- Project name, location, legal description, and total area (acreage);
- Project sponsor and funding source;
- Nature of the ground-disturbing work/undertaking within the project area/APE;
- Applicable local, state, and/or federal laws;
- Overview of permitting and consultation required to implement the archaeological investigation;

- Class I overview, including a review of ASM's ARO files for the most updated site boundaries;
- Affected archaeological sites or other resources (e.g., historical neighborhoods not assigned an ASM site number, projected canal locations), including the current ARHP/NRHP-eligibility status of those resources;
- Specific research themes, questions, and data requirements appropriate to location and resources affected by the project, including any deviations or amendments to the above research design;
- Approach to completing archival and historical research;
- As appropriate, approach to pursuing information about TCPs;
- As appropriate, approach to pursuing outreach with descendant communities;
- Archaeological approach or approaches to be implemented (monitoring, phased data recovery, eligibility testing, etc.), including an overview and justification of an investigative strategy (e.g., mechanical or hand excavation);
- Recommended plan of action in the event of significant archaeological findings, insignificant findings, or no findings;
- Feature and artifact sampling plan, as appropriate;
- A schedule for providing project updates to HPO and/or the lead federal/state agency (e.g., weekly, biweekly); and
- Requirements and schedule for project deliverables (e.g., reports, curation)

The addendum plan minimally should include all maps as required by SHPO and ASM, including one or more maps that clearly show the project area boundary (or boundaries) on a USGS topographic quadrangle map background and the locations of previous projects and sites within the project review area. Additional maps or graphics should be added, as needed, including aerial views if helpful and an excavation strategy map showing the proposed locations of systematic test trenches and/or collection units.

A Class I inventory (background records research) should be completed as part of the addendum plan. For all projects, the contractor minimally will complete an inventory within the project area and a half-mile radius surrounding the project boundary or boundaries (i.e., the "review area"). Maps and tables should be included as necessary to summarize the projects, sites, and historic properties within the review area. Aboveground resources such as historical buildings need not be included in this Class I inventory, although historical aerials depicting land use should be included to illustrate potential Historic period archaeological resources that may be encountered during investigations.

Environmental Permitting, Safety, and Cultural Sensitivity

In addition to archaeological permitting discussed under *Legal Contexts and Requirements*, for excavation projects the contractor must ensure that all required environmental, dust, and stormwater discharge permits are obtained before the fieldwork begins. If required, a stormwater pollution prevention plan (SWPPP) will be developed, a notice of intent filed with the Arizona Department of Environmental Quality, and best management practices will be implemented. A dust control plan and permit also may be required in accordance with Maricopa County Air Quality Department guidelines. Other permits, such as those issued in compliance with ARPA or encroachment permits for working within an ADOT right-of-way may restrict the removal of vegetation or have specific requirements for avoidance of other environmental impacts.

All contractors working within Tempe must implement internal safety standards and guidelines that adhere to all applicable federal, state, and municipal safety regulations. All excavations and monitoring projects must have at least one Competent Person who has completed Excavation Safety Training in accordance with federal Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1926 Subpart P. Daily "tailgate" safety meetings also are recommended to identify potential hazards specific to each project, including heat stress guidelines. A health and safety plan should be developed for each excavation and monitoring project, which should include a list of phone numbers and addresses for local law enforcement agencies, hospitals, or medical centers and ensure that it is kept on site in a secure and accessible location at all times.

COT's recently adopted HP Plan encourages cultural sensitivity training from either the SPRMIC or the GRIC and requires this training for COT employees and for some private development projects as a condition of approval. This training is focused on helping non-Native American field personnel to better understand the cultural heritage of the contemporary O'Odham, Piipaash, and possibly other Native American groups with ancestral affiliations to the Tempe area. SPRMIC's and GRIC's training classes are intended to help attendees accept and respect cultural differences; recognize situations in which the cultural heritage of the Native American groups are threatened; and learn effective ways of helping protect and preserve those cultural resources, including treating information about cultural resources as confidential. Cultural sensitivity training may also be required for construction contractors or project personnel as a condition of an MOA or PA.

TYPES OF INVESTIGATIONS

Inventories

Class I Inventories

Appendices A–C of this document provide Class I background information for the archaeological resources in Tempe, including lists, maps, and project coverage, previously documented or projected sites, and historical resources within the city limits. The contractor will cite the background information presented in this document and update it with current data from appropriate background sources as part of the project-specific addendum plan. The Class I inventory should include research for the project area and a 1-mile radius for block areas, or a ½-mile radius for linear projects. Records will be gathered from the ASM-ARO and AZSITE, the statewide electronic inventory of cultural resources for projects in Arizona. Other data repositories such as the ADOT Historic Preservation Team Portal or other landowning agencies (e.g., BOR, SRP) may also have relevant records that should be accessed depending on the location of the project and review areas.

As part of the Class I research, AZSITE and historical records should be reviewed to ensure that water conveyance structures such as open and piped lateral canals associated with BOR and SRP are identified. If a BOR/SRP structure in is located within the project area, it is necessary to alert HPO or the lead federal agency to coordinate with BOR and SRP to determine potential involvement of these agencies in the project, which may elevate the project to a Section 106 undertaking (see *Legal Contexts and Permitting* above). HPO coordination with BOR and SRP will help to determine fee versus easement status for these structures, potential impacts, agency involvement, and any access permit requirements. Research conducted using

historical aerials or other historical source information (e.g., GLO plats) should also be included in Class I inventories to identify the potential for historical resources and disturbances within the project area. If prepared as a standalone document for the purposes of assessing the need for further work, Class I reports will include the results of the background research accompanied by recommendations for future work.

Class III Inventories

Class III cultural resources inventories (intensive pedestrian archaeological surveys) will rarely be used to identify cultural resources within the heavily urbanized landscape encompassed by Tempe, although relatively undisturbed or undeveloped greenspace parcels will benefit from a Class III inventory (e.g., Papago Park Preserve). Pedestrian survey is not suitable for paved or heavily "landscaped" surfaces (e.g., artificial grass and vegetation), as archeological resources are rarely preserved or visible on such surfaces. If determined appropriate, pedestrian archaeological surveys will be performed in accordance with ASM and SHPO standards and permitting requirements. Pedestrian non-collection surveys conducted on municipal, county, or state land would be implemented under the contractor's AAA blanket permit (renewed annually by ASM). If the survey area is less than 640 acres, a formal NOI form needs to be submitted to ASM prior to starting the pedestrian survey. If the survey area is greater than 640 acres, the contractor will need to formally apply for an AAA project-specific permit from the ASM. Under Rules Implementing A.R.S. §15-1631 and §41-841 *et seq*., visits to ASM-designated sites for the purpose of determining their current condition are considered archaeological surveys by ASM and also would need to be conducted under the contractor's AAA blanket permit.

The contractor will complete archaeological surveys using parallel pedestrian transects spaced no more than 20 m apart (15 m apart for federal land), unless otherwise specified in the addendum plan. All cultural resources observed within the project area (isolated occurrences, archaeological sites, in-use historical structures) will be recorded with a GPS unit, and any observed sites will be defined in accordance with ASM's Revised Site Definition Policy. Site recording will entail a written description of the site, GPS-based mapping, and photographs. Recommended components of the site descriptions to be provided in a site form/report include topographic placement of the site, sediment type and potential for buried deposits, site size, total number of artifacts by type, diagnostic artifacts, feature descriptions, site condition, disturbance impacts to sites, and any threats to site integrity. No collections will be made during surveys unless an especially significant or unusual artifact or other unique item is observed; consultation with the HPO, SHPO, ASM, and possibly other consulting parties is needed prior to making any collections.

Historical In-Use Structure Documentation

The ASM definition of an archaeological site has been revised to exclude historical structures that are still in use. Per ASM, "'In-use historical sites and features' means, without limitation, buildings, structures, transmission lines, pipelines, canals, trails, roads, and railroads that are 50 years old or older and that are operated, maintained, or repaired for original or similar purposes" (Arizona State Museum 2016). Therefore, the SHPO, in partnership with the Historic Archaeology Advisory Committee (HAAC), has implemented forms and processes (Historical Archaeology Advisory Committee and Arizona State Historic Preservation Office 2020) for documenting these resources using a Historical In-Use Structure Form (HISF).

The forms should be accompanied by archival research and a relevant historic context with which to evaluate the significance of the in-use historical structure(s) and provide eligibility recommendations. The *Guide to Documenting Historical In-Use Structures* (Historical Archaeology Advisory Committee and Arizona State Historic Preservation Office 2020) prepared by HAAC and SHPO provides instructions on completing the forms. Although treatment options for in-use historical structures are not included within this general plan, such treatment options may include Historic American Engineering Record (HAER) or Historic American Buildings Survey (HABS) documentation, additional archival research and historic context development, interpretive signage, and/or other measures.

Archival and Historical Research

In 2021, COT celebrated its 150th year as a community in the Salt River Valley. Despite the deluge of urban development in recent decades, cultural remains of Tempe's early history may still be preserved in subsurface contexts. Therefore, a plan for archival and historical research should be developed for all archaeological investigations within the city limits. The contractor should complete an appropriate level of archival research while preparing the addendum plan in order to manage expectations of feature types and fieldwork strategies. The addendum plan should also include a supplemental research component to be implemented following fieldwork if significant historical resources be identified.

Secondary histories can be used to develop a general history of the area. Where possible, primary sources should also be consulted to investigate the histories of buildings, infrastructure, and landscapes within the project area. Potential sources for primary records may include historic Tempe city directories, newspapers, letters, Sanborn-Perris Fire Insurance maps, and historical photography (including aerial photography). Local repositories of primary and secondary records include the Tempe History Museum; HPO; Arizona History Museum (Tempe Branch); Arizona State Library, Archives, and Public Records; ASU Hayden and Noble Libraries (multiple archive and map collections are available at these libraries); and Burton Barr Phoenix Public Library (Arizona Room). In recent years, a number of internet sites have become valuable sources for researching primary and secondary materials, including:

- Arizona Memory Project: https://azmemory.azlibrary.gov/
- ASU Digital Repository: https://repository.asu.edu/
- BLM-GLO Federal Land Records Site: https://glorecords.blm.gov/
- Maricopa County GIS Portal (Historical Aerials): https://gis.maricopa.gov/GIO/HistoricalAerial/index.html
- Historic Aerials: https://www.historicaerials.com/
- Library of Congress Sanborn-Perris Fire Insurance Maps: https://www.loc.gov/maps/?q=Arizona+Sanborn+maps
- Newspapers.com: https://www.newspapers.com/

The HAAC periodically updates its publication *Historical Archaeology in Arizona: A Research Guide* to provide information on conducting historical research in Arizona. This updated guide is intended to direct professionals seeking information on a historical place or person to resources held in numerous repositories (i.e., libraries, historical societies, institutions, and government agencies). Topics discussed include maps, photographs, architectural plans and drawings, local histories, mining records, newspapers, and more. As of

the date of this writing, HAAC is currently working on a significant update, but the 2013 revised publication can be downloaded from the SHPO website (https://azstateparks.com/shpo-forms-and-publications).

The contactor also should consider oral history interviews with community leaders and residents, as well as individuals of the diverse ethnic communities who have played an important role in Tempe's development over time, notably the Native American (i.e., Akimel O'Odham, Piipaash, and Yaqui), Mexican and Mexican American, African American, and Asian communities. Since 1970, the Tempe History Museum has conducted more than 300 interviews with many of Tempe residents; these interviews, many of which have been transcribed, can be reviewed at the research library.

Traditional Cultural Property Identification

National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties defines TCPs as properties that are associated "with the cultural practices or beliefs of a living community that are rooted in the community's history and are important in maintaining and the continuing cultural identity of the community." Archaeological resources, landscapes, and project areas in Tempe should be evaluated as potential TCPs or components of TCPs affiliated with one or more traditional ancestral communities. The majority of TCPs identified in Tempe likely will pertain to Native American groups with deep ancestral roots in the Tempe area (primarily O'Odham, Piipaash, Pascua Yaqui, Apache, Yavapai, and Hopi groups); however, other non-Native American groups with historical roots in the area also potentially could identify TCPs, for example, Mexican American communities with historic associations to former neighborhoods situated in Tempe.

Some TCPs can be documented with the help of historic records or ethnographic studies, but most information is maintained by the descendent communities with historically rooted beliefs, customs, and practices affiliated with specific locations and area situated in or near Tempe. Ancestral or descendent communities often maintain traditional knowledge about specific places and landmarks over multiple generations through oral or written histories not accessible to outside groups. Therefore, most information about TCPs must be obtained by consulting directly with those ancestral communities. For projects with a federal nexus, the lead federal agency is responsible for consulting with Native American Tribes regarding TCPs and other properties of traditional cultural and religious significance on a government-to-government basis.

Consistent with Resolution No. R2021.08 adopted in 2021 which recognized the lands that comprise Tempe as culturally affiliated with the O'Odham (Pima), Piipaash (Maricopa), and their ancestors (see *Consultation* above), COT's recently adopted HP Plan has identified goals and priorities for communication with descendant communities about TCPs, sacred sites, and cultural landscapes and provides guidance for project considerations related to these resources (City of Tempe 2022:56–59). Although some of the goals and priorities overlap with those previously presented in the *Consultation* section of this plan, the following goals and priorities specifically relate to the identification of TCPs, sacred sites, and cultural landscapes:

- Goal IV, Priority 10: At the planning stage, consult with Tribes and appropriate agencies to determine the level of cultural resource inventory needed, including assessments of TCPs, sacred sites, and archaeological sites.

- Goal IV, Priority 14: Consider viewshed of and visual effects to cultural landscapes, including identifying criteria for evaluation and consultation for sites of concern (e.g., proposed project height, radius of sacred site to proposed project, shade, and solar studies) in consultation with affiliated Tribes.
- Goal V, Priority 6: Provide Tribes with a full report and documentation of evaluation and consultation process for projects, including procedures for identification and compliance with professional standards including those mandated by relevant permitting agencies.
- Goal VI, Priority 2: Identify TCPs and potential areas related to TEK with affiliated Tribes, such as the SRPMIC, GRIC, and the Pascua Yaqui Tribe.
- Goal VI, Priority 19: Acknowledge cemeteries and other areas of cultural/religious significance as TCPs with considerations for access, privacy, and protection (including proximity effects).

As with all eligible cultural properties, federal and other state, Tribal, and municipal regulations require the identification of TCPs through consultation and, if feasible, the adoption of measures to protect them (Parker and King 1998:4). However, the unique characteristics of TCPs and the potential impacts that they may sustain from of a project can be very different from those sustained by other cultural resources resulting from ground disturbance and other direct or indirect effects. In fact, for sacred sites or traditional religious TCPs, direct and indirect adverse effects may be considered desecration that cannot be addressed fully by standard approaches for mitigation such as data recovery. Ethnographic contexts as guiding documents can be useful in identifying TCPs and guiding the consultation and planning process to include efforts that will anticipate, minimize, or avoid potential effects to TCPs. However, under conditions of adverse effect, adequate responses to impacts that consider the traditional cultural values of a TCP must be developed in consultation with the affiliated Tribe(s) and cultural group(s).

Some responses may include cultural sensitivity orientation (CSO), typically provided by the affiliated Tribe or cultural group for all staff and consultants working on a project, and traditional religious activities (TRA), also provided by the affiliated Tribe or cultural group. Additional responses may include enhancement through documentation of the oral and historical traditions associated with a TCP to assist with historic property nominations or to preserve the cultural knowledge for the affiliated community that may be threatened by impacts to that TCP. Condition assessment and Change Detection Monitoring (CDM) using high precision photogrammetric mapping and seismic recording to monitor the structural integrity of TCPs may be effective for properties that are threatened by proximity blasting or vibrations created by heavy machinery. Many Tribes prefer not to identify TCP boundaries or feel it is inappropriate. Identification through consultation of preservation zones or cultural sensitivity areas to adequately protect and buffer TCPs from potential threats offers a solution for planning. However, if necessary, project-specific boundaries that are unique to a project to protect TCPs can offer an additional layer of protection when wider preservation zones are exceeded. In all cases, respect for the particular cultural needs and sensitivity of affiliated communities is paramount in identifying appropriate measures for protection, preservation of TCPs, and when necessary their treatment.

Archaeological Monitoring

Archaeological monitoring refers to the routine inspection by a trained archaeologist (archaeological monitor) of the horizontal and vertical exposures of the substrate resulting from ground-disturbing activities, such as during construction or demolition work. One or more trained professional archaeologists will inspect the exposed substrate as it is removed to assess whether significant intact cultural resources are present and, if so, whether those resources exposed will be adversely affected by the continuation of the ground-disturbing work. Ground-disturbing activities that may be subject to monitoring include the following:

- Construction of buildings, roads, walkways, and other structures;
- Excavation of postholes for installation of poles (e.g., light poles), signs, or fence posts;
- Installation and maintenance of underground infrastructure, such as buried utility lines, irrigation facilities, and drainage basins;
- Demolition of building and structure foundations and underground infrastructure; and
- Landscaping activities, such as planting or removal of trees and plants.

All of these ground-disturbing work activities could potentially adversely affect archaeological resources, including work involving relatively shallow subsurface impacts or in previously disturbed contexts where the depth or spatial extent of disturbance is unknown. In addition, archaeological monitoring may be required following eligibility testing and/or phased data recovery projects with significant cultural resource findings to ensure no additional significant cultural resources or human remains are present outside the investigated area(s).

For activities requiring monitoring, a trained and qualified archaeological monitor must be present during ground-disturbing activities. Multiple monitors will be needed if ground-disturbing activities occur simultaneously in different areas within the project area; one monitor will be assigned to each mechanical earthmoving machine that is active at any given time. The monitor will inspect excavated exposures and removed soils for evidence of cultural artifacts or ash/charcoal-stained soil. If the exposed substrate can be safely accessed, the sidewalls of excavations will be faced (the sides scraped flat by shovel or trowel) to delineate subsurface cultural features, disturbances, and soil horizons more clearly, and the sides and bottoms of excavation units will be inspected for cultural features after facing. The monitor will maintain a daily log of monitoring activities, keep notes of any findings, and record locations of monitored units and feature encounters using a GPS unit.

In general, nonfunerary archaeological features discovered during monitoring should be evaluated in consultation with the HPO, SHPO, ASM, any landowning agencies (as applicable), and Tribes (for prehistoric features) to determine whether the feature(s) warrant further investigation (i.e., full exposure and hand excavation) or a less substantial level of documentation, such as partial excavation, soil sampling, or detailed documentation of the exposed portion of the features (i.e., the cross-section profile of the feature in the trench wall or walls). The contractor should also record the representative natural stratigraphy and note any variations throughout the project area. Sufficient time must be allowed for the exposed portion of the feature to be excavated, sampled, or thoroughly documented in accordance with the requirements determined by HPO, SHPO, and ASM. Procedures for recording exposed features are described in the *Feature Investigation Methods* section below.

The following chronological list of procedures and actions is intended to assist contractors with addressing potential cultural resource discoveries observed during monitoring:

- When a potential discovery is encountered, all construction activity within 50 ft (15 m) of the discovery location will cease, and sufficient time will be allocated for the monitor to assess the discovery. All traffic through the construction area near the discovery must halt to create a safe work environment. Only traffic necessary to remove vehicles and equipment from the discovery area will be allowed to continue. Work elsewhere within the project area may continue with the presence of a monitor. For encounters involving human remains, please see *Protocols for the Treatment of Human Remains* below.
- The archaeological monitor will verify the presence of an archaeological deposit and evaluate its potential significance. During verification and evaluation, the archaeologist will have the authority to probe and shovel-skim to the extent necessary to determine whether the remains qualify as a significant cultural resource. If the find does not qualify as a cultural resource discovery (e.g., less than 50 years old), then construction may resume.
- If the discovery is determined to represent a confirmed archaeological resource, then a buffer area of at least 50 ft (15 m) surrounding the discovery will be established, and work shall not resume until the contractor has consulted with the HPO, SHPO, ASM, and possibly other consulting parties, as appropriate, to determine the proper treatment for the discovery.
- If the HPO, SHPO, ASM, other consulting parties determine that the discovery requires no further action, construction may resume.
- If the cultural resource discovery is determined to be significant, the following issues must be resolved in consultation with the HPO, SHPO, ASM, and possibly other consulting parties:
    - Confirmation of the nature and scope of treatment to be completed;
    - Determination of the nature and scope of any protective measures required once the ground-disturbing work resumes; and
    - Determination of the nature and scope of any additional treatment at or near the discovery location (e.g., mechanical stripping for additional features in the vicinity).
- If significant nonfunerary archaeological resources are observed, the feature recovery procedures described in the *Feature Investigation Methods* section below will be implemented to expose and investigate the feature.
- The locations of all features observed during monitoring should be recorded using a GPS unit with an error range of no more than 3 m.
- All nonfunerary cultural materials recovered during investigation of a discovery will be curated with project materials.

Eligibility and Identification Testing

ARHP/NRHP-eligibility testing (abridged here as “eligibility testing”) is limited in scope and intended to assess the presence and/or significance of buried archaeological resources within a site that has not yet been formally determined to be eligible or ineligible for the ARHP/NRHP. Per SHPO guidelines, the purpose of eligibility testing is “to gather information beyond that collected during archival research and/or surface survey. The resulting data is used to assess a site’s significance in terms of an applicable historic context

and physical integrity" (Bilsbarrow 2003). Eligibility testing typically occurs in contexts where archaeological surface materials are present, but the surface archaeological record is insufficient to determine whether the site warrants a recommendation of eligibility for the ARHP/NRHP. It typically entails limited testing (trench or hand excavations) to assess the subsurface archaeological record while minimizing impacts to potentially significant subsurface archaeological resources. Identification testing is conducted using similar techniques to eligibility testing, although it is used in areas with a known site but where site boundaries are unclear due to low ground visibility, often from modern activities such as agricultural tilling and asphalt-paving (Bilsbarrow 2003). For projects with a federal nexus, a MOA does not need to be developed prior to implementing a plan for eligibility or identification testing.

If investigations are proposed within the boundaries of a known ASM site, an AAA project-specific permit will need to be obtained prior to fieldwork. All work must be conducted by or under the supervision of a principal investigator listed on the AAA project-specific permit. For investigations with the potential to disturb human remains on municipal, county, state, or private land, a request for a BDA should be submitted to ASM. A repository agreement should be obtained from an accredited facility prior to requesting permits (see *Management and Curation of Project Collections and Records* for more information). If testing is conducted on private lands, it may be necessary to obtain deeds of gift from the landowner prior to fieldwork. If testing is conducted on federal land, an ARPA permit and NAGPRA POA must be requested prior to fieldwork. Additional permits and licenses related to access or use also may be required depending on the location of the project area.

A project-specific health and safety plan should be created to outline emergency procedures. A Maricopa County Dust Abatement permit should be requested for projects meeting ground disturbance limits, and dust mitigation measures shall be implemented. A SWPPP may also be required for projects exceeding 1 acre of disturbance (see *Environmental Permitting, Safety, and Cultural Sensitivity* section for more information). Other prefield logistical tasks may include coordinating a backhoe(s) and water truck(s), coordinating access to hydrants, concrete/asphalt cutting, and arranging for delivery and at least weekly cleanouts of a portable toilet(s). Just prior to the fieldwork, Arizona 811 shall be notified to mark the locations of any known utility lines occurring anywhere in the potential archaeological excavation areas to ensure the lines are not accidentally disturbed by the excavations. Private utility location also may be conducted. The contractor also should arrange for site security measures while excavations are ongoing, including installing fencing with privacy screening around each location, and potentially hiring on-site security when trench or excavation units are open during non-working hours, including nights and weekends. All field crew should attend the SRPMIC Cultural Sensitivity Training program and review the SRPMIC media policy before the fieldwork begins.

In some situations, testing will include surface artifact collection and/or minimally invasive assessments (e.g., mapping) of features visible on the modern surface, such as refuse features, rock features, historical structures, infrastructure, or landmarks. As appropriate, the contractor's addendum plan should include a strategy for limited collection of artifacts and/or an assessment and documentation of surface features. At a minimum, all diagnostic surface artifacts present on non-concrete/asphalt or landscaped surfaces should be flagged and collected. If surface collection is not warranted, the addendum plan minimally will include

strategies for documenting surface artifacts without collection (e.g., a broad overview of the artifact density, discussion of frequent artifact types, a basic chronological assessment).

Test excavations will proceed after completion of surface collections and/or surface feature-recording (if warranted). Eligibility and identification testing typically warrants a limited amount of subsurface exposure to detect possible features and, if detected, broadly evaluate them in terms of basic feature type, age, and integrity. The presence of one or more intact prehistoric or historic features will typically warrant a recommendation of eligibility under Criterion D (potential to yield important information pertaining to prehistory or history) in the case of eligibility testing, or confirmation that the site extends into the tested area in the case of identification testing. Where feasible, backhoe trenching is a highly efficient means of probing and sampling the project area to identify and evaluate feature types and integrity so that the features can be further investigated using the controlled feature recovery techniques outlined below. In areas with relatively thin soils unsuitable for trench excavations, eligibility testing might require hand excavation of test units to detect buried features.

The addendum plan should describe and justify an excavation approach suitable to the geomorphological context of the project area. For contexts with relatively deep sediments (e.g., floodplains or alluvial fans) where backhoe trenching generally is appropriate for subsurface testing, the total area tested by the backhoe trenches should encompass no less than 1.5 percent of the accessible ground surface within the project area (i.e., excluding known areas with active underground utilities or streets). The trenches can be either systematically placed (i.e., regularly spaced across the project area) or judgmentally placed in selected locations, depending on the context, surface evidence or archival information related to feature locations, and project area conditions. Trenches will be excavated no deeper than 1.5 m unless shoring or trench-side tapering is implemented in accordance with OSHA trench safety standards (29 CFR 1926.650). Trench length and placement will be dictated by the geomorphology and logistics of the site to a maximum total length of 20 m per trench. Ramps or ladders shall be placed every 25 feet, including a stepped or ramped exit at both ends of the trench. All backhoe trenching will be monitored by an archaeologist. Trenches will be faced (the sides scraped flat by shovel and trowel) to delineate subsurface cultural features, disturbances, and soil horizons; trench sides and bottoms will be inspected for cultural features after facing.

The project geomorphologist will inspect a representative sample of the trenches at the site to define the stratigraphy, establish relationships among any features that may be identified, and evaluate potential site formation processes that could have affected subsurface features. At the direction of the project geomorphologist, a sample of trenches should be documented with a 2-m-long representative profile drawing in the field to record the natural stratigraphy. At the discretion of the geomorphologist, deep trenching may be conducted based on observed stratigraphy to investigate Hohokam features that exceed 1.5 m in depth and to search for evidence of deeply buried Archaic occupations; if implemented, deep trenches will be judgmentally placed based on field conditions and subsurface soil deposits. Deep trenches shall be stepped per OSHA trench safety standards.

Because the focus of testing will be to identify and evaluate the significance of any encountered cultural resources to determine if a site is eligible for the ARHP/NRHP or confirm the site's boundary, artifacts

exposed in profile will not be collected unless an artifact is determined to be diagnostic or is fragile or subject to vandalism or theft if left in place. Backdirt from the trenches will not be screened. Diagnostic artifacts observed within the backdirt will be noted on trench forms. Any feature(s) identified will be mapped using a GPS unit, profiled in its entirety, photographed (except funerary features), and recorded with field forms. All units of investigation will be mapped using a GPS device capable of centimeter (cm) accuracy or equivalent-accuracy device (e.g., a total station). With the exception of water control features (see *Feature Investigative Methods* below), samples should not be collected during testing.

In the event that human remains (inhumations, cremations, and isolated human remains) or an animal funerary feature are encountered during test excavations, the encounter will be treated in accordance with the terms of the BDA or NAGPRA POA and *Protocols for the Treatment of Human Remains* presented in this document. All work in the vicinity (minimum of 100 ft) of the encounter will immediately cease, and the recovery of funerary remains will not proceed until instructions are received from Tribal representatives.

Data Recovery

Phase I and, if necessary, Phase II data recovery investigations (i.e., multi-phased data recovery) will be implemented within sites recommended or determined eligible for inclusion in the ARHP/NRHP in order to determine the nature and condition of the subsurface deposits and mitigate adverse effects from a proposed project. If a project that has been determined to result in adverse effects to ARHP/NRHP-eligible archaeological resources and has a federal nexus, then a MOA or PA will need to be executed by the lead federal agency, SHPO, Tribes, and other consulting parties prior to data recovery. The following discussion outlines general procedures for data recovery excavation fieldwork; however, particular aspects may vary based on the nature of the site and project. Specific approaches should be described and justified in the addendum plan.

Phase I Data Recovery

Phase I data recovery (also called data testing) is a component of the mitigation process developed to resolve an adverse effect to ARHP/NRHP-eligible or ARHP/NRHP-listed archaeological resource (SHPO Guidance Point No. 2) (see Bilsbarrow 2003). The purpose of Phase I data recovery is to gather information about the subsurface archaeological record within the project area including the frequency, types, and distribution of buried features, which in turn provides a basis for determining the need for further work (e.g., Phase II data recovery, monitoring).

Prefield tasks and investigative strategies for Phase I data testing are similar to those outlined above for *Eligibility and Identification Testing* and typically entail backhoe trenching in areas with appropriate geomorphological contexts. However, Phase I testing typically warrants a systematic sampling plan in which the total area of backhoe trenching encompasses 3–5 percent of the accessible ground surface within a project area. The trenches typically should be systematically spaced across the project area to test all accessible areas with potentially undisturbed native soils beneath the modern surface grade. In many cases, additional judgmental trenches are warranted to investigate specific areas with identified or suspected features, although testing percentages should be limited enough to avoid testing a site “out-of-existence” (Bilsbarrow 2003:4). In addition, should sensitive contexts such as funerary features or sacred architecture

be identified during data testing, trenching may be reduced in those areas to avoid further disturbance of those features prior to controlled investigation during Phase II data recovery.

In areas with relatively thin soils, Phase I test excavations typically entail systematic and/or judgmental hand excavation of test units. In some cases, Phase I testing could require hand excavation of a sample of surface features, such as rock piles and rock alignments. Relatively small surface features are usually bisected, i.e., half the lateral extent of the feature is excavated to expose the feature in profile. After the profile is illustrated, the other half of the feature might be excavated or left in place, depending on the feature's significance and other considerations. Larger surface features might be sampled using one or more test units (1 m-by-1 m or 1 m-by-2 m). Specific methods for excavating surface features should be clarified in the addendum plan.

In the event that human remains (inhumations, cremations, and isolated human remains) or an animal funerary feature are encountered during test excavations, the encounter will be treated in accordance with the terms of the BDA or NAGPRA POA and *Protocols for the Treatment of Human Remains* presented in this document. All work in the vicinity (minimum of 100 ft) of the encounter will immediately cease, and the recovery of funerary remains will not proceed until instructions are received from Tribal representatives.

It is recommended that an in-field meeting with consulting parties be offered at the termination of Phase I data recovery fieldwork to discuss the field findings and the need for additional work, if any. If no significant deposits are found during Phase I testing, and no additional work is determined to be necessary, the Phase I testing fieldwork component may conclude the required cultural resource investigations at the site. If the consulting parties determine that further data recovery is necessary, Phase II data recovery excavations will be implemented as discussed below and in the addendum plan. The fieldwork will be considered complete when the consulting parties agree that the work completed is sufficient to meet the requirements put forth in the approved addendum plan.

Phase II Data Recovery

Phase II data recovery investigations focus on addressing research questions applicable to the types of features and subsurface deposits identified during the preceding testing investigation(s). The Phase II data recovery investigations involve considerably greater use of horizontal excavation (mechanical stripping), hand excavation, and screening of materials. Phase II data recovery field methods also typically require collection of artifacts and samples from excavated features and selected nonfeature contexts for detailed analysis and curation.

For most Phase II data recovery investigations, sediments overlying the features observed during Phase I are mechanically stripped in contiguous stripping units to expose those features in plan; the locations and depth of the features can be anticipated based on the results of the preceding testing investigations. Following the completion of stripping, the exposed surfaces are cleaned with shovels, gas-powered blowers, and brooms, after which the feature outlines are marked and excavated by hand as outlined in *Feature Investigation Methods* below. The stripping and excavation units should be expanded as needed if additional features are discovered. Mechanical stripping units typically are expanded to 10 m beyond the last identified

feature within the boundaries of the project area. The addendum plan should provide justification if a smaller stripping area buffer will be employed.

Data recovery of non-funerary features generally focuses on specific features or groups of features that have the potential to yield the most information to address the research questions provided in this plan and the project-specific addendum plan. If feature sampling is required, feature types will be ranked by location, integrity, and frequency before assessing what features could best contribute to answering the research questions in consultation with applicable parties, which may include HPO, SHPO, ASM, Tribes. An overview of methods to be used for excavating and documenting specific feature types are outlined below in *Feature Investigation Methods*. At the recommendation of the historian/historical archaeologist, archival research may be conducted in addition to or in place of excavation of historical features, depending on the nature of the feature(s).

PROTOCOL FOR THE TREATMENT OF HUMAN REMAINS, ANIMAL MORTUARY FEATURES, SACRED CEREMONIAL OBJECTS, AND OBJECTS OF NATIONAL OR TRIBAL PATRIMONY

In the event human remains older than 50 years, or animal mortuary features, sacred ceremonial objects, and objects of national or tribal patrimony are encountered, the *Protocol for the Treatment of Human Remains* outlined below will be followed. The contractor shall adhere to the stipulations in the ASM BDA in the event that prehistoric or historic O'Odham funerary features are encountered on state, county, municipal, or private land, including halting all work within 100 ft of the encounter and notifying the HPO, the lead claimant Tribe (typically SRPMIC for projects located north of Baseline Road and GRIC for projects located south of Baseline Road), and ASM (per ARS §41-844 for encounters on state, county, or City land and ARS §41-865 for encounters on private land). Should any funerary feature identified as historic Yaqui be encountered on state or private land, the ASM Repatriation Office shall be notified, which will begin consultation with appropriate claimant. If remains that represent a cultural or archaeological tradition other than O'Odham, Hohokam, or Archaic are encountered on state, county, City, or private land, the ASM Repatriation Office shall be notified and initiate consultation with potential claimants. If human remains or an animal mortuary feature are encountered on federal land, human shall be made to the federal agency per the stipulations in the NAGPRA POA; disposition of the human remains and any associated funerary objects also shall follow the protocols identified in the NAGPRA POA. If agency consultation should delay recovery of the individual, the remains shall be secured in place behind a locked fence or gate, plating, and/or with stationed security personnel, as needed, until instruction for the recovery is issued by the lead claimant Tribe.

Human remains shall be treated with dignity and respect at all times. All recovery shall follow accepted archaeological standards and comply with all applicable federal and state laws pertaining to the treatment and recovery of human remains. In general:

- Recovery of human remains shall be conducted in private without visitors or observers.
- No photographs shall be taken of the human remains or funerary objects.
- Human remains and funerary objects shall be bundled in natural materials and escorted to an approved secure laboratory and documented in that location. Representatives of the lead claimant Tribe shall be provided the opportunity to view, in the laboratory, all items recovered in association with the funerary feature to identify funerary or sacred objects.

- Documentation shall be nondestructive.
- A Report of Remains (complete documentation of human remains and cultural objects) shall be prepared and submitted to ASM and all claimant Tribes per the requirements of the BDA. If a NAGPRA POA applies, documentation will be submitted consistent with the POA.
- Disposition of human remains, funerary animal remains, funerary objects, sacred ceremonial objects, and objects of national or Tribal patrimony will be completed after the final report has been accepted or upon the schedule requested by the SRPMIC or GRIC THPO.

Once instruction to recover the remains is received from the lead claimant Tribe, the contractor shall recover the funerary feature in its entirety. Under the supervision of an archaeological monitor, the disturbed overburden above the remains shall be mechanically removed in increments up to 5 cm above the top of the funerary feature (e.g., pit outline) to expedite recovery. The human remains shall be recovered by a bioarchaeologist/physical anthropologist or an archaeologist experienced with the recovery of human remains using only hand tools such as trowels and brushes. Fill adjacent to the remains shall be screened through eighth-inch mesh. The remains shall be mapped and drawn (for records only), then carefully gathered and bundled in natural materials for escort and interim housing in a secured location at the consultant's laboratory. All associated funerary belongings shall be mapped in situ, recorded, and recovered with the interred individual(s).

If a cremation is encountered, the extent of the funerary feature shall be documented and mapped. The cremated remains shall be recovered in their sedimentary matrix, and the surrounding sediment shall be screened through eighth-inch mesh. Cremated remains and associated funerary objects, if any, shall be bundled as described above. If the cremated remains are encountered in association with an intact vessel, the vessel shall be recovered in its entirety, and the vessel matrix shall not be disturbed during documentation. Direct communication with the HPO, ASM, and Tribes shall be maintained on all issues involving human remains, associated funerary objects, sacred ceremonial objects, and objects of national or Tribal patrimony.

Documentation of Human Remains

Recovered human remains shall be escorted to the consultant's laboratory and documented on cranial and funerary register forms. All documentation shall be performed using nondestructive methods only. Human remains shall be dry-brushed to remove any adhering soil but shall not be washed or rinsed; all soil shall be retained and included for repatriation and reinterment. Any associated funerary objects shall be housed with the remains. Documentation will proceed according to provenience of each funerary feature. Isolated human remains that are determined to represent single individuals shall be housed together. Isolated human remains that cannot be associated with an individual shall be separately documented according to skeletal element and provenience.

All identifiable human remains shall be documented macroscopically, using magnification as needed. Osteological documentation, including skeletal inventory/completeness, age estimation, sex identification, nonmetric traits, skeletal and dental metrics, taphonomy, and pathological conditions, shall be conducted according to the *Standards for Data Collection from Human Skeletal Remains* (referred to hereafter as

Standards) (Buikstra and Ubelaker 1994); analytical data shall be recorded on forms provided by ASM (Arizona State Museum 2018), which are based on *Standards*. *The Human Bone Manual* (White and Folkens 2005) and *The Osteology of Infants and Children* (Baker et al. 2005) also shall be used for information on identification and description. Standard osteological measurements and estimation of sex shall be completed when possible. Dental nonmetrics shall be documented in accordance with the Arizona State University Dental Anthropology Data Collection System (Turner II et al. 1991).

All human remains shall be examined for pathology and anomalies. Potential dental pathologic conditions may include, but are not limited to, dental caries, dental attrition (tooth wear), enamel hypoplasia, abscesses, periodontal disease, and antemortem tooth loss. Evidence of degenerative changes, infection (e.g., osteomyelitis and periostitis), nutritional deficiencies, trauma, and other abnormalities and anomalies present shall be described in detail and compared with descriptions and illustrations in Ortner (2003). If the pathologies observed for an individual suggest a specific condition, the bioarchaeologist shall provide differential diagnoses by first completing a homunculus (in this case, a labeled drawing of the human body) showing the distribution of pathologies, followed by identification of possible conditions that typically display distributions of lesions similar to those observed. References on paleopathology (e.g., Aufderheide and Rodríguez-Martín 1998; Ortner 2003) shall be consulted to confirm initial identification of conditions and to ensure all possible diagnoses are considered. Suggestions and interpretations shall be then made for each condition that could be represented by the observed pathologies.

Cremated remains shall be documented for funerary, demographic, and pathological information. Cremations recovered within complete vessels shall not be documented; the vessel matrix shall not be disturbed. Isolated burned human remains and cremations contained within broken vessels shall be documented in the laboratory. When possible, the remains shall be identified by anatomical element and then by side and segment. Remains that cannot be identified to a specific element shall be grouped by region (e.g., cranial fragments, long bone fragments, miscellaneous fragments), and the resulting groups shall be counted, measured for minimum and maximum length (mm), and weighed (g). The degree of burning and the effects of taphonomic processes on the cremated remains shall be assessed based on the completeness of elements, variation in the color of burned bone, and observed changes to the surface of the remains.

All funerary belongings shall be fully documented and housed with the human remains prior to repatriation.

FEATURE INVESTIGATION METHODS

The approaches described in this section are meant to provide general guidelines for a range of feature types. Individual contractors should present any deviations from these excavation and feature-recording protocols tailored to archaeological research themes and historic contexts that may be applicable to the project area in their addendum plans. Minimally, all features should be documented using standard recording forms, one or more scale drawings of the feature in plan and/or profile, and one or more representative photographs (except for mortuary features). If features are fully or partially excavated in levels/strata or using multiple excavation units, then separate forms should be used for each excavation level/stratum and unit.

Investigative Procedures by Feature Type

Prehistoric Structures

Depending on the specific project context and pursuant to consultation, prehistoric pithouses, field houses, masonry room blocks, or other types of structures and possible structures may be fully or partially excavated to determine their function and associations and to maximize the potential to recover suitable materials for chronological assessment. Detailed architectural information, including plan and cross-section profile drawings, should be recorded on standardized forms, and each structure and associated subfeatures should be photographed from multiple angles and during various stages of the excavation. Minimally, structures should be exposed to define their horizontal extent (or as much of it as possible within the accessible project boundary). One or more test units or hand trenches should be excavated to define the feature's vertical dimensions (e.g., depth of floor) and internal stratigraphy (cultural fill). Fill from hand trenches should be removed as one continuous level and screened through quarter-inch wire mesh (or eighth-inch mesh if small objects are present). Artifacts identified in the fill should be collected for analysis. Once the vertical and horizontal extents of the structure have been defined, its internal stratigraphy should be delineated for excavation either with a scaled stratigraphic drawing of an exposed internal profile, or by profiling one wall of a hand-excavated trench placed to bisect the structure along its longitudinal axis.

Small structures (e.g., field houses) might be excavated as a single unit. Larger structures may be excavated using defined excavation units (e.g., halves, quarters, individual rooms, or defined grid overlay). The first unit (i.e., quadrant, half) may be excavated in arbitrary 10-cm levels unless cultural strata (e.g., roof fall, ash lens) are apparent; additional units should be excavated following cultural strata as individual levels. All soil should be screened through quarter-inch wire mesh (or eighth-inch mesh if small objects are present), and either all or a previously approved sample of artifacts should be collected for analysis.

The last 5 cm of fill directly above the floor of each structure should be maintained as a separate provenience (floor fill/contact), and any artifacts in contact with the floor should be mapped and point-provenienced before removal. If clearly defined burnt roof fall is present, the provenience of artifacts found on, within, and below the burnt material also should be recorded. If present, subfeatures should be mapped and photographed, then excavated as outlined below for specific feature types. Botanical samples should be collected from intact contexts, such as below artifacts in floor contact, roof/wall fall, and from excavated intramural hearths and floor pits. These protocols maximize recovery of paleoenvironmental and subsistence information and help identify site formation processes that might have behavioral significance.

After excavation of subfeatures and finalization of structure paperwork, mapping, and photography, subfloor excavation of the structure will proceed. This will entail hand excavation to a depth of 10 cm below the floor or base of the structure to ensure no subfloor features, secondary floors, or mortuary features are present. Partial excavation of structures may be warranted, although a sampling strategy should be included within the plan addendum for approval in consultation with the HPO, consulting parties, and permitting agencies. Should structure sampling be needed, a minimum of one quadrant will be excavated within each structure following the methods above. The remaining unexcavated portions of the structure will be mechanically stripped, and the stripping will be monitored by an archaeologist to ensure that no mortuary features are present within or below the structure.

Historical Buildings and Structures

The following data recovery methods apply only to historic buildings and structures that are no longer in use. The best and most suitable investigative methods should be determined based on both testing results and information obtained from historic maps, photographs, and other documents. For example, a specific excavation strategy can be tailored to the presence of historic buildings made with adobe versus timber and brick or cinderblock, as determined from archaeological evidence (testing results) or historic records. Minimally, however, buried historic architectural features, such as building foundations or architectural debris, should be partially or fully exposed in plan through a combination of mechanical and hand stripping. Once exposed, a hand trench should be employed for larger features such as foundations to expose a cross-section, and the feature should be outlined to define the feature in plan view.

All investigated archaeological historic building remnants should be mapped, photographed, and recorded using standardized forms and scale drawings. Diagnostic artifacts and materials should be collected to assist with determinations of age and function. Following excavation of the main building, the areas beneath the outlines of the buildings should be tested for the presence of basements, cellars, or more deeply buried features. If a basement or cellar is observed, its vertical and horizontal extent should be defined and documented through mechanical stripping and trenching, and at least a sample of artifacts should be recovered from the fill. Depending on the size, contents, and preservation of the basement or cellar, one or more 1-m by 1-m units may be excavated by hand to more rigorously document associated artifacts and materials.

Should subsurface remnants of abandoned historical roads or railroads be identified during trenching, the exposure of the abandoned structures and any associated features will be profiled/mapped and photographed, and measurements will be taken. If the location of an abandoned historical structure such as a road or railroad bed is visible from the surface, the surface expression of the feature will be mapped and photographed. After surface documentation, exposure of the subsurface portions of the structures will entail backhoe stripping to remove the overburden. After complete exposure of the abandoned linear structures and any associated features, measurements will be taken. Photographs also will be taken during and after exposure of the historic structures. Finally, the exposed alignments as they occur in the project area will be mapped using a GPS unit capable of cm-grade accuracy. If the project is required to comply with AAA, ASM must be contacted so that the structure's site number can be added to a previously issued AAA project-specific permit or an emergency project-specific AAA permit can be issued.

Pits

Extramural hearths or thermal pits (e.g., roasting pits), storage pits, and nonthermal pits of undefined function may be sampled or fully excavated depending on their size, depth, and the number of features encountered. Investigations should focus on recording the feature's location and relationship to other features; documenting its morphology, dimensions, and the nature of its fill; and determining its function and chronology of use.

At a minimum, all pits should be mapped to reveal the pattern of their placement within the investigation area. Excavation of the feature may be completed as a single unit (for pits smaller than 1.0 m), via bisection (pits between 1.0 and 2.0 m in diameter), or by quartering (pits greater than 2.0 m in diameter). using levels that follow internal stratigraphy or 10-cm arbitrary levels. All materials recovered from pits should be screened through quarter-inch mesh (or eighth-inch mesh if small objects are present). Pollen and flotation samples should be collected generally towards the base of the feature. Chronometric samples (i.e., archaeomagnetic, radiocarbon) should also be collected when possible. Any unexcavated pits should be subjected to the probing method where a trowel is inserted into the feature to sufficiently disturb the feature fill and ensure that no mortuary features are present.

Refuse Features and Large Extramural Features

Data recovery methods for other prehistoric and historic extramural features will vary depending on the size, significance, and complexity of the features. At a minimum, features associated with extramural activity areas should be mapped, illustrated in plan and profile, photographed, and recorded using standardized forms. Excavation then may proceed following the general guidelines outlined below and any deviations detailed in the approved addendum plan. If a project area is projected to contain a large number of extramural features, a sampling plan for the investigation should be developed in the project-specific addendum plan, subject to agency consultation and approval prior to implementation (see *Feature Sampling* section below).

Large extramural features, such as hornos, privies, surfaces, and large refuse pits, may be fully excavated or partially excavated using one or more excavation units. Large extramural features (2 m or greater in diameter) may be sampled using controlled excavation of one or more 1 m by 1-m excavation units within each feature, with the number and size of the excavation units to be defined in the project-specific addendum plan. If no well-defined stratigraphy is identified within these features, the units should be excavated in 10-cm arbitrary levels. Pollen and flotation samples should be collected from a sample of the levels within the units. All soil from the features should be screened through quarter-inch mesh (or eighth-inch mesh if small objects are found). Any unexcavated portion of large refuse features should be mechanical stripped to ensure no mortuary features are present.

Extramural surfaces and deposits, such as ash lenses and charcoal stains, should be hand-stripped and swept to determine whether they represent architectural features (e.g., ramada) or activity areas, and inspected to establish whether they might be the result of protohistoric or historic reuse. Some ephemeral surfaces and features may contain evidence of food processing, tool manufacture, or pottery production; such areas should be carefully excavated and/or sampled (e.g., pollen, flotation, and potentially phytolith) for their potential contribution to research issues. Artifacts found associated with extramural features or in contact with use surfaces should be point-provenienced and mapped before collection. All sediments excavated from extramural surfaces and deposits should be screened through quarter-inch mesh (or eighth-inch mesh if small objects are present).

Canal and Water Control Features

A geomorphologist should be employed to guide documentation and provide recommendations for treatment of water control features. If the project is required to comply with AAA, ASM must be contacted so that the

water control feature's (e.g., canal) site number can be added to a previously issued AAA project-specific permit or an emergency project-specific AAA permit can be issued. Prehistoric and historic canals, ditches, and other features related to irrigation and water control such as reservoirs, irragric soils (anthrosols), and field remnants should be thoroughly documented, mapped, and illustrated. For water control features, a representative profile should be recorded for each exposure and compared to assess the size and orientation of the feature as closely as possible. Morphometric attributes also can be used to assess construction and use of the feature. For canals, gradient data can sometimes be obtained from two or more basal elevations of the canal, and open channel hydraulic equations can be completed if sufficient data are available.

Depositional strata and soil characteristics (color, texture, structure) from each identified stratum should be evaluated; control samples also should be collected from sediments below the feature and in the post-abandonment fill. If reservoirs, irragric soils, or field remnants are identified, column samples should be collected from each stratum and representative sample sets should be processed for pollen, flotation, and other analyses (e.g., particle size analysis, ostracodes, phytolith) as appropriate. Diagnostic artifacts observed within feature profiles should be recorded and possibly collected for analysis. If well-developed irragric soils are identified, soil horizons should be sampled and analyzed for soil fertility. If present, charred macrobotanical remains suitable for radiocarbon analyses should be collected from canal-related deposits to date the period of canal use and help reconstruct canal system development and irrigation history.

Based on recommendations from the project geomorphologist, additional backhoe trenching may be undertaken to better define the direction and extent of a canal and any laterals that extend away from the channel. Mechanical stripping may also be employed to determine the presence of subfeatures such as postholes, gates, or turnouts if a canal is identified at a bifurcation point with another water control feature, to fully define the extent of a reservoir feature, or to search for field remnants if they are suspected to be present based on the location of canal features.

Imprints

Prehistoric foot and handprints form when people leave impressions in wet or pliable surfaces that subsequently dry, and although rare, trackways or multiple associated prehistoric human footprints are found in the Southwest, including within Tempe (Fox et al. 2020; Rayle and Swanson 2019). Upon an encounter of footprints, handprints, or trackways, protection and preservation measures should be implemented while consultation with the parties including affiliated Tribe(s) is conducted.

Once permission to proceed is received from the consulting parties, hand-stripping will be conducted around the feature to fully define its extent, expression, and orientation. The total number of prints will be recorded to assist with interpretations of human activities and the number of individuals present. Photographs of the prints will be taken, along with hand-drawn scaled maps and high-accuracy GPS shot data. Sediment directly above the prints will be brushed into paper bags for pollen and phytolith sampling. During documentation, prints will be protected by covering them with unbleached muslin followed by a more durable protective material such as a tarp with edges weighted by sediment (not stones, which may become dislodged and damage the features).

If preservation in place is not feasible, molds and casts of the prints should be taken, followed by recovery of the original feature from the surrounding matrix if possible. The field methods described below are based on the treatment applied to a print discovered by EPG (Rayle and Swanson 2019) at the base of a water conveyance channel within AZ U:9:165(ASM)/La Plaza. Materials used in the preparation, molding, casting, and extraction of the prints may include:

- Mold Max 14NV silicone RTV mold rubber
- THI-VEX© thickening agent
- Accel-T™ silicone cure accelerator
- Silicone separator
- Hydrocal FGR 95 fast-setting gypsum cement
- Two-part epoxy
- Fiberglass
- Metal pipes (galvanized electrical conduit) for reinforcement

To prepare the feature for mold creation and casting, the feature surface will be cleared of loose sediment using a blower set to low speed and any rootlets will be removed with root or nail clippers. A quick-setting, two-part epoxy will be applied to the surrounding surface matrix with a penetration depth goal of 1 to 2 cm. After the epoxy dries, a silicone separator will be applied to the surface of the epoxy, followed by a thick layer of liquid silicone. “Mold keys” will be created by setting small wooden blocks onto the surface of the mold while it is still wet to facilitate alignment of the mold into a rigid support structure. Once the silicone dries, the rigid support structure is created by applying gypsum cement atop the silicone.

After the mold is completely dry, it will be lifted from the surface, inverted, and checked for successful capture of the impressions. A cast can then be created from the mold by applying a 1 cm thick gypsum cement layer over the mold. Tubular metal struts will be placed atop the wet cement to provide structural support, which is then overlaid with fiberglass and another layer of gypsum cement. Once completely dry, the cast and mold are separated and inspected, and the original feature will be excavated. Casts and molds should be curated at the conclusion of the project.

Should mold and cast production not be feasible due to fragility, print morphology, or other constraints, another option for imprint documentation is LiDAR mapping technology, which renders a digital 3-D model. Previous mapping efforts associated with imprints located within a sacred architecture feature identified by Logan Simpson at AZ U:9:165(ASM) were mapped with a Leica ScanStation P40 high definition 3-D laser scanner; the prints were also lightly outlined in chalk for a second set of overlapping, high resolution photographs (Jacqueline Fox, Logan Simpson, personal communication, November 2, 2022).

Sacred (Public) Architecture

There is a possibility that remnants of sacred (public) architectural features will be encountered by projects in Tempe. Remains of sacred architecture may be represented as:

- An extensive, well-defined, and noticeably deeper cultural horizon suggestive of a large structure;
- Substantial adobe walls present as both horizontal and vertical alignments, with or without reinforcement;

- Large structural features such as a capped mound with prominent walls exhibiting multiple interior rooms in profile;
- An unusual concentration of distinctive mortuary features and/or sacred ceremonial objects suggestive of nearby sacred architecture.

Most of the proposed excavation methodology outlined within this plan was devised from previous investigations of similar architecture, including Logan Simpson's recent excavation of a possible "ceremonial room" (Cureton 2020; Fox et al. 2020). However, consultation with the HPO, Tribes, SHPO, and ASM (as applicable) will ultimately determine the overall investigative strategy.

After careful inspection of the structure exposure(s), machine and hand excavation of one or more trenches may be conducted to ensure that the structure's foundation and/or footers are completely exposed to allow for complete mapping and profiling. Following any supplemental trenching, and once initial documentation of the structure has been completed, overburden will be carefully removed by a backhoe to 5 cm above where the structure begins in profile, followed by hand-stripping with screening to completely expose the structure in plan view. A 5-m buffer around the structure will also be mechanically stripped to identify any surrounding features. After hand-stripping to expose exterior and interior walls, wall exposures will be documented using electronic mapping with cm-grade accuracy, as well as detailed and scaled drawings. Drone mapping may also be used to document the progress of the structure's exposure, if approved by the consulting parties.

After exposure of the structure's extent, interior and exterior walls, and any subfeatures, test units will be hand-excavated within the interior of the structure using stratigraphic control for the collection of artifacts and appropriate samples (including samples suitable for archaeomagnetic and radiocarbon analyses, if present). All artifacts will be collected for documentation; objects identified by the Tribes as sacred ceremonial objects and objects of national or Tribal patrimony will be repatriated after documentation. After profiling of the internal stratigraphy of the structure has been completed, all interior test units will be excavated up to 10 cm below the structure floor to identify any subfloor features. Sampling portions of the structure's exterior and interior walls may be employed to determine construction processes, information about massing and shape, and any structural changes made when occupied or used. Consultation with the parties is critical throughout the process and regular updates should be provided, including regarding post-excavation treatments of the structure.

In addition to the archaeological method described above, an ethnographic study should be completed as part of sacred architecture documentation. This study may entail field visits with Tribal community representatives, as well as oral interviews and comparative discussion of other sacred architecture and TCPs identified in the vicinity.

Feature Sampling

A feature sampling plan should be included in the project-specific addendum plan for all excavation and monitoring projects. In the addendum plan, the contractor should present a clear strategy for selecting a sample of features for full excavation, partial excavation, and non-excavation, including an explanation of sampling criteria and the feature types considered to be priorities for excavation. In general, development of

a feature sampling plan should consider the feature integrity, redundancy, and pertinence to the research themes. Intact and/or rare and unique features typically are accorded higher priority than disturbed and/or redundant features. Some redundant features or features with indistinct or disturbed deposits may be sampled, partially excavated, or documented only as exposed in trench profiles or mechanical stripping units without additional excavation. Features and feature types with the potential to yield information pertinent to the research themes should be accorded higher priority than those considered to be not pertinent to the research themes. Recovery of mortuary features is the highest priority, and mortuary features must be recovered in their entirety (see *Protocols for the Treatment of Human Remains*) in compliance with the project's BDA or NAGPRA POA.

ARTIFACT AND MATERIAL ANALYSES

The range of artifact and sample types in a project collection will vary based on the project's archaeological context (e.g., prehistoric vs. historic, habitation versus agricultural) and the scale of the investigation. Most project collections derive from testing and data recovery investigations but monitoring also may generate collections. The following brief overviews of analytical approaches focus on the anticipated range of artifact types associated with the known archaeological resources previously documented in Tempe. Addendum plans also should consider additional techniques such as residue analysis, isotopic analysis, and 3D imaging as applicable based on anticipated contexts and artifacts. These additional material sciences applications are contingent upon Tribal consultation and approval *prior* to implementation.

Prehistoric Ceramic Analysis

Most prehistoric ceramics recovered from sites within Tempe's municipal limits will be affiliated with the Hohokam ceramic tradition, although non-local wares are often present in assemblages throughout the lower Salt River Valley (e.g., Montero and Bostwick 2019). These ceramics can be broadly classified as plain, red, or buff wares. At a minimum, prehistoric ceramic sherds and whole or partial/reconstructible vessels recovered from non-funerary contexts should be rough sorted to obtain general information about the collection such as ceramic ware and type (e.g., Abbott 1992, 1994, 2000; Abbott et al. 2012; Gladwin et al. 1965; Haury 1945; Wallace 2001, 2004; Wood 1987), basic morphology (e.g., rim or body sherd, worked sherd, whole/reconstructible vessel, figurine), and counts per provenience unit. Buff ware design elements (Abbott et al. 2012; Wallace 2001, 2004) should be recorded for red-on-buff types to refine relative dates.

Following the initial rough-sort classification, more detailed ceramic analyses should be implemented. Sherds of sufficient size (larger than 2.5 cm^2) recovered from non-funerary feature contexts and all ceramics from funerary contexts should be analyzed to record attributes of manufacturing, functional, and behavioral significance, including but not limited to technological properties (e.g., manufacturing technique, surface treatment, color and texture of the clay fabric, temper inclusions); vessel morphology and function (e.g., bowl, jar, scoop; rim shape and diameter); and use-wear transformations such as post-firing blackening, surface abrasion or spalling, and wear patterns.

Macroscopic examination of sherds based on available petrofacies data should be conducted to identify the source of the tempering materials and infer locus of manufacture in an effort to address research questions related to the direction and degree of local and regional economic exchange (e.g., Abbott 2000; Kelly 2013;

Miksa et al. 2004; Ownby and Miksa 2012). Finally, any worked sherds (e.g., mending holes, disks with or without central holes, and sherds with ground edges) or modeled clay objects (e.g., figurines, spindle whorls) should be photographed or drawn if associated with a funerary feature, described, and measured. A sample of ceramic sherds may be thin-sectioned for petrographic analysis to provide quality control.

Electron microprobe analysis provides another line of evidence for characterizing clay composition and inferring production provenance and technologies that may involve a range of potential geochemical characterization techniques including an electron microprobe analyzer, Laser-Ablation Inductively-Coupled Plasma Spectrometry (LA-ICPS), Particle Induced X-ray Emission (PIXE), Instrumental Neutron Activation Analysis (INAA), and other techniques (Kelly 2013).

Lithic Analysis

Flaked stone tools should be examined according to a set of functional, morphological, and technological attributes using traditional typologies appropriate for the Phoenix Basin and pertinent time period (Paleoindian, Archaic, Hohokam). Suitable methods and coding systems for flaked stone debitage and tools are presented by Andrefsky (1998), Sullivan and Rozen (1985), and Sliva (1997). Loendorf and Rice (2004) and (Sliva 2015) present projectile point typologies suitable for the region. All flaked stone artifacts minimally should be coded according to artifact type (e.g., Adams 2002, 2014; Andrefsky 1998, 2001; Slaughter et al. 1992; Sliva 1997; Sullivan and Rozen 1985), raw material (e.g., Bates and Jackson 1984; McGraw-Hill 2003), completeness, manufacturing technique, shape, extent and type of use wear, amount of cortex, weight, presence or absence of thermal alteration (e.g., Luedtke 1991), and modification(s). Obsidian sourcing should be considered for an appropriate sample of artifacts utilizing X-ray fluorescence (XRF) analysis (e.g., Loendorf 2019; Shackley 1988, 1995, 2005).

Ground stone tools, such as grinding implements, should be examined according to a set of functional, morphological, and technological variables using traditional typologies appropriate for the region (e.g., Adams 2002, 2014). For ground stone artifacts, quantitative measurements of weight, length, width, and thickness should be recorded as well as depth measurements of working surfaces for basin and trough metates, mortars, and similar artifacts. Hand lenses or microscopic examination may be used to aid in identification of raw materials, use wear, and evidence of manufacturing techniques, as well as to aid in the identification of small fragments. Nondestructive geochemical analyses (e.g., XRF) of vesicular basalt ground stone tools and comparisons to available geochemical references (following Fertelmes 2014) may be employed to address questions related to the manufacture and exchange mechanisms influencing the observed distribution of these artifacts at Hohokam sites in Tempe.

Faunal and Shell Analyses

Faunal remains should be sorted into identifiable and unidentifiable classes using comparative specimens, as well as published reference materials (e.g., Gilbert 1990; Gilbert et al. 1985; Lawrence 1951; Olsen 1968, 1973). Those that are identifiable should be tabulated at the species level whenever possible. Unidentifiable bones will be sorted by size class (e.g., small, medium, or large mammal) and tabulated. Taphonomic analysis will follow standard procedures that include notation of cut and butchering marks, fracturing patterns,

degree of burning, and natural processes such as weathering, soil erosion, and gnawing by carnivores and rodents (Binford 1981:105; Lyman 1994).

Shell fragments should be analyzed for taxonomic identification, shell portion, and modifications using shell comparative specimens, as well as standard texts with comparative photos and descriptions (e.g., Abbott 1954; Bequaert and Miller 1973; Keen 1960; Morris 1966; Webb 1942; Wye 1991). Technological class should be modeled after assignments used by Howard (1987). Artifact class should follow classifications used by Vargas (2000) and Jernigan (1978), which provide references for worked shell artifacts and their forms.

Historical Artifact Analysis

Because of the variety and multi-material composition of historical artifacts, it is usually more meaningful to classify historical materials using a system combining both material and functional attributes (Armstrong 2001; Cleland 2001; Deetz 1977; Diamond 2001; Hicks and Beaudry 2006; Hume 1969; South 1977). Artifacts should initially be classified into categories. All bottles, other types of glass, and ceramics should be described according to color, shape, construction, size, and where possible, identified as to original content and date of production. Clothing includes items such as shoes, fabric, buttons, jewelry, and buckles, and should be analyzed for size and material, and, if possible, by the inferred sex and age of the user. Tin cans should be separated from other metal objects because these items can be dated based on their manufacturing techniques, opening methods, and contents. All metal items other than tin cans, such as wire, nails, and bullet cartridges, will be classified separately, as will miscellaneous articles such as pieces of cut wood, paper, cement, and other structural items.

Each material classification should include an assignment of context, which is a functional organizing device used to group artifacts based on behavior. Contexts include kitchen, commercial food use, alcoholic beverage and non-alcoholic beverage use, chemical and cleaning products, household furnishings, personal grooming and dressing, clothing, agricultural activities, ammunition and arms, adults' and children's leisure activities, military service, construction or repair activities, hardware, and educational supplies.

Botanical and Other Soil Samples

Pollen, flotation, and phytolith samples should be collected from undisturbed feature contexts including beneath floor contact artifacts in structures, from the interiors of vessels, from the base of pit features, and from features that appear to exhibit rapid fill sequences. In some cases, nonfeature (control) samples may be taken to provide a baseline for the analysis of remains from feature contexts. Samples collected from feature contexts will be processed and analyzed to identify subsistence practices (i.e., cultigens and/or native plants) used at the site, as well as contribute to interpretations regarding feature function and temporal association (see *Chronometric Samples* below). Identification and analysis of palaeobotanical results should be conducted by a paleobotanical expert using comparative collections and following accepted standards for identification and interpretation of pollen data (Anderson and Koehler 2003; Bryant Jr. and Holloway 1983; Faegri and Iversen 1989; Harder and Thomson 1989; Hevly et al. 1965; Martin 1963; Orvis 1998; Schoenwetter and Doerschlag 1971; Solomon et al. 1982; Young and Stanton 1990), phytolith data (Bozarth

1990; Jones and Bryant Jr. 1992; Piperno 1988), and macrobotanical data (Adams 2004; Fish 2004; Ford 1981, 1985; Gasser 1987; Gasser and Kwiatkowski 1991; Jonathan B. Mabry 2005; Minnis 1981:147; 1985).

Soil sediments from various defined strata of canals and water storage features may be analyzed for particle size to assess water flow and sediment accumulation. Analyses of recovered pollen and flotation samples should be collected to determine the types of plants that might have been cultivated in adjacent fields, vegetation in the general vicinity, and environmental and subsistence change through the use-life of the canal. Fossil ostracodes may be used to evaluate seasonal use of canals and their wet-and-dry cycles.

Chronometric Samples

For chronometric analysis, commonly used techniques include radiocarbon analysis, archaeomagnetic analysis, and luminescence analysis, but additional techniques also might be applicable. If radiocarbon samples are available in good (i.e., undisturbed) contexts, analyses might include radiocarbon assay of charred remains and accelerator mass spectrometry (AMS) dating of carbonized seeds recovered in flotation. If suitable undisturbed thermally altered surfaces are encountered (e.g., hearths, burned floors), samples for archaeomagnetic dating may be collected and submitted for analysis.

Optically-Stimulated Luminescence (OSL) may be used to date sediments from canals or other contexts, as recommended by the geomorphologist. The chronology of water control features also can be evaluated through analysis of associated temporally diagnostic ceramics, radiocarbon samples derived from flotation sampling of sediments, and stratigraphic positioning and episodes of remodeling. All chronometric samples selected for analysis should be analyzed by a qualified expert in archaeological dating techniques.

Artifact Sampling

In some circumstances, it might be appropriate for the addendum plan to include an artifact sampling plan in the event that it is impractical or infeasible to collect all artifacts encountered in the project area. For example, some functionally and temporally nondiagnostic artifacts might not warrant collection for analysis and curation. As appropriate, the contractor should clearly explain and justify their strategy for artifact sampling in the addendum plan so that it can be evaluated by SHPO, ASM, and the HPO. Sampling plans also may be devised to include collection of all artifacts, with analysis focusing on a sample of the collection based on criteria such as context of recovery, artifact type, diagnostic potential, and relevance to the research design.

REPORTING GUIDELINES

Technical Reports

At the conclusion of each project, the contractor will prepare a professional technical report (or reports) documenting the procedures, findings, and management recommendations based on the results of the fieldwork. The report will be submitted to HPO and/or the lead federal/state agency for review within no more than six months for eligibility, identification, Phase I data testing, or monitoring projects; 18 months for phased data recovery projects; or within a timeframe stipulated in the plan addendum and/or MOA/PA following the completion of fieldwork. The contractor's approach to preparing technical reports will depend on the scope and complexity of the archaeological investigation. The following are broad guidelines for preparing the technical report based on the scope and complexity of the investigation.

- For survey, monitoring, and testing projects with no or minimal findings, the contractor should submit a draft final technical report to the HPO and/or the lead federal/state agency within a short, pre-established timeframe following completion of fieldwork for review and consultation. The draft final technical report will serve as the principal consultation document prior to implementation of planned ground-disturbing work within the project area.
- For investigations with more complex findings and/or collected materials that require laboratory analysis, such as phased data recovery and monitoring projects with feature investigation components, the contractor should plan for the following report schedule:
    - A draft preliminary end-of-fieldwork (EOF) report should be submitted to the HPO and/or the lead federal/state agency within a short, pre-established timeframe (typically 10 working days) following completion of fieldwork. The draft EOF report will serve as the principal consultation document prior to implementation of planned ground disturbing work within the project area. EOF reports typically provide brief summaries of key fieldwork findings and investigative methods as implemented, any deviations from the plan, and summary recommendations for additional research or fieldwork (e.g., monitoring).
    - A draft final technical report typically will be submitted no more than 18 months after fieldwork has been completed. The final technical reports should include detailed discussions of data analyses and findings as they pertain to the research themes and questions.
- For any projects that involve one or more encounters of human remains, a Report of Remains must be submitted to ASM, which shall include a comprehensive inventory and documentation of the remains and associated funerary objects, per the BDA issued for the project.

All technical reports should meet the specifications set forth by the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (Federal Register, September 29, 1983, and 36 CFR §800.2[a][1], revised August 2004), as well as reporting standards established by the SHPO and ASM. The technical reports minimally should contain the following elements: a detailed description of the project; the cultural context and background; a summary of the research design; the investigative methods employed; detailed descriptions of the project findings as they relate to the research design; broader discussion of the project findings and how they contribute to archaeological understanding at a site scale and regional scale; and management recommendations for additional treatment (e.g., monitoring), if applicable, of archaeological resources within the project area. All technical reports should include supportive tables, figures, photographs, data appendices, and maps as necessary. All technical reports should be prepared in accordance with SHPO and ASM standards, required formats, and terms of submission.

Copies of all draft technical reports will be submitted to the HPO and lead federal/state agency (if applicable). For federal or state projects, after approval of the report by HPO and the lead agency (if applicable), the lead federal/state agency will submit the report to SHPO, other involved agencies, and affiliated Tribes for consultation. For projects not mandating consultation under NHPA or SHPA, the HPO will submit the report for consultation with affiliated Tribes. The permitted consultant is responsible for submitting the draft technical report to ASM for concurrent review if working under an AAA permit. After the initial agency review of the report draft, the contractor will address any review comments and submit the revised draft to ASM and the HPO, who will circulate it to SHPO and other reviewing parties, or to the lead federal agency for distribution

to the consulting parties, to ensure that all the reviewers' comments were addressed in the revision. The report is not considered to be final until all comments have been addressed to the reviewers' satisfaction.

Protocols for Submitting and Sharing Technical Reports

At the conclusion of each project, the contractor will submit hardcopies and digital copies (in PDF format) of all final technical reports to the HPO; the number of hardcopies will depend on the number of reviewing parties. The contractor also will submit GIS shapefiles to the HPO to assist with the maintenance of the HPO's project and sites GIS dataset. In addition, hardcopies and digital copies (in PDF format) of all final reports should be submitted to ASM at the completion of the project under an AAA permit, along with the completed project registration form (PRF).

Sharing of reports and data files generated from archaeological investigations on properties in Tempe is strictly prohibited without express written permission from the HPO and/or land managing agency. The HPO and/or land managing agency also should be consulted with, and informed about, any professional conference papers, posters, publications, public lectures, or other forms of outreach stemming from archaeological investigations in Tempe.

MANAGEMENT AND CURATION OF PROJECT COLLECTIONS AND RECORDS

A repository agreement between the contractor and the Huhugam Ki Museum, Huhugam Heritage Center, or Tempe History Museum (THM) will need to be obtained prior to beginning any archaeological project involving ground-disturbing activities and is required as part of the application for an AAA project-specific permit with ASM. The Huhugam Ki Museum and Huhugam Heritage Center will receive the right of first refusal for a project curation when available (City of Tempe 2022) and if approved under ASM policy for AAA-permitted projects. Should the project collections and records be curated with the Huhugam Ki Museum or Huhugam Heritage Center, analytical and collections management procedures should adhere to the respective repository standards and guidelines. Any project collections and records not being curated with either the Huhugam Ki Museum or the Huhugam Heritage Center will be curated with the THM, and analytical and collections management procedures should adhere to THM standards, as well as ASM's *Requirements for the Preparation of Archaeological Project Collections for Submission to the Arizona State Museum* (Griset et al. 2004).

Disposition of If human remains, animal mortuary features, sacred ceremonial objects, and objects of national or tribal patrimony are will be completed in accordance with the project's BDA or NAGPRA POA.

At the close of a monitoring, testing, or data recovery project (i.e., when the analyses and report writing effort are concluded), all project paper records will be electronically scanned and photocopied for digital curation. The contractor must contact Huhugam Ki Museum, Huhugam Heritage Center, or THM to obtain the current criteria and specifications for preparation of archaeological collections for curation. All artifacts, digital and paper documents, reports, and other project materials will be curated in accordance with the appropriate repository's criteria and specifications and transported to Huhugam Ki Museum's (1759 N. Longmore Road, Scottsdale), Huhugam Heritage Center's (21359 S. Maricopa Road, Chandler), or THM's (809 E. Southern Avenue, Tempe) secure repository facility.

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