AT THE VANISHING POINT

ENVIRONMENT AND PREHISTORIC LAND USE IN THE BLACK ROCK DESERT

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American Museum of Natural History Anthropological Papers, Number 103

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Anthropological Papers of the American Museum of Natural History, no. 103
http://dx.doi.org/10.5531/sp.anth.0103

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ANTHROPOLOGICAL PAPERS OF
THE AMERICAN MUSEUM OF NATURAL HISTORY
Number 103, 216 pages, 53 figures, 66 tables
Issued June 29, 2018

ISSN 0065-9452

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ABSTRACT

This volume presents the results of data recovery excavations directed at prehistoric archaeological deposits located near Sulphur Springs, along the southeastern margin of the Black Rock Desert, in Humboldt and Pershing counties, Nevada. Although 20 sites with prehistoric assemblages were identified during this project, intact spatio-temporal components were found at only seven of these sites, of which just five were the focus of intensive data recovery excavations: 26HU1830, 26HU1876, 26HU2871, 26HU3118, and 26HU5621. A total of 372 m^3 of excavation by hand was directed at dateable components within these five sites. The results of this effort yielded a substantial artifact assemblage, including a variety of flaked and ground stone tools, shell and bone beads, as well as large quantities of faunal bone and debitage. Also documented were an assortment of features, including a number of small processing facilities and the remnants of several house floors.

Key to this investigation was the isolation of a series of discrete temporal components. Eleven such components were identified representing six temporal intervals: Early Archaic (5700–3800 cal B.P.), Middle Archaic (ca. 3000 cal B.P.), mixed Middle/Late Archaic (3800–600 cal B.P.), Late Archaic A (1340–1165 cal B.P.), Late Archaic B (985–855 cal B.P.), as well as Late Archaic (1300–600 cal B.P.) deposits that could not be further separated into smaller units of time. It is particularly noteworthy that many of these components have very narrow time frames, in many cases smaller than the traditional Great Basin periods.

The profile of projectwide time-sensitive projectile points and radiocarbon dates, coupled with a robust artifact and feature assemblage dated to narrow time frames, allows for an assessment of changes in habitation and land-use pattern with an unusual level of resolution. Prior to about 4500 years ago, occupations appear to have been sporadic, with people making brief visits to the area during periods of increased effective moisture and spring discharge associated with the Early Holocene, and largely avoiding it for more promising areas during times of drought during the Middle Holocene. Archaeological visibility increases significantly after 4500 cal B.P., including periods when substantial houses were constructed, and people supplemented the local resource base with foods and materials obtained from distant locations possessing richer concentrations of large game and obsidian toolstone. These more intensive habitations were not constant, however, and were abandoned during a major Late Holocene drought cycle that occurred between 2800 and 1500 cal B.P. Robust habitation returns during the initial Late Archaic period but is bimodal with a sudden break at about 1000 B.P., a spike at roughly 985 to 855 cal B.P., followed by another break. The settlement profile may have been in response to the drought-wet-drought cycle of the Medieval Climatic Anomaly. Along with the role of environmental change in trans-Holocene settlement structure, the large feature and artifact assemblages provide commentary on a variety of other research themes, including the rise of Middle Archaic residential stability and logistical hunting; Middle versus Late Archaic domestic/habitation patterns; local cryptocrystalline silicate (CCS) toolstone production and obsidian conveyance patterns; subsistence-settlement variation within the Late Archaic Period; and an assessment of the missing Terminal Prehistoric record within the project area and surrounding region.

INTRODUCTION

This volume presents the results of data recovery excavations directed at prehistoric archaeological deposits located near Sulphur Springs, along the southeastern margin of the Black Rock Desert, in Humboldt and Pershing counties, Nevada (fig. 1). The study area is bounded on the south by the Kamma Mountains and on the north by the Black Rock Desert playa. At an elevation of about 4400 ft (1342 m), the area is a mostly barren landscape of alluvial fans and lake sediments laid down during highstands of pluvial Lake Lahontan that is now capped with low dunes and sand sheets. This landscape, however, is punctuated by a series of fault line springs and seeps, including

Sulphur Springs, which probably played a major role in the human settlement of this area.

The excavations were undertaken as part of the permitting and compliance process associated with the expansion of the existing Hycroft gold mining facility at this locality, with Lead Agency review provided by the Bureau of Land Management, Winnemucca field office. Fieldwork was accomplished over several field sessions between 2012 and 2013 and was both designed and conducted by Western Cultural Resource Management, Inc. (WCRM), under contract with the Hycroft Mining Corporation. WCRM also performed the initial phase of post-fieldwork studies, including collection and catalog preparation, as well as most artifact analyses. Far Western Anthropological Research Group, Inc. (Far Western), was contracted in August 2015 to review and revise the catalog; review, and where necessary, supplement the analytical program; and prepare a final research report, which is contained herein.

Thirty-five sites were investigated as part of this study. This includes eight sites with prehistoric components only, and 12 multicomponent sites (i.e., mixed prehistoric and historic-era materials) with either dominant or substantial prehistoric components (table 1). The remaining historic-era sites and multicomponent historic-era sites with either dominant or substantial historic-era components were presented in a separate technical report (McGuire et al., 2017). The 20 sites with substantial prehistoric deposits were also presented in a technical report (McGuire et al., 2017), and are the subject of the presentation contained herein (fig. 2).

Although 20 sites with prehistoric assemblages are dealt with in this volume, intact spatio-temporal components were identified at only seven of these sites, of which only five were the focus of intensive data recovery excavations: 26HU1830, 26HU1876, 26HU2871, 26HU3118, and 26HU5621. A total of 447 m^3 of deposit was hand-excavated during the project, of which 372 m^3 was directed at dateable components within these five sites. The results of this effort yielded a substantial artifact assemblage, including a variety of flaked and ground stone tools, shell and bone beads, as well as large quantities of faunal bone and debitage. Also documented were an assortment of features, including a number of small processing facilities and the remnants of several house floors. Excavations at these five sites form the backbone of both the analytical results and research interpretations contained in this volume.

Key to this effort was the identification of a series of discrete temporal components. Eleven such component contexts were identified representing six temporal intervals: Early Archaic (5700–3800 cal B.P.), Middle Archaic (ca. 3000 cal B.P.), mixed Middle/Late Archaic (3800–600 cal B.P.), Late Archaic A (1340–1165 cal B.P.), Late Archaic B (985–855 cal B.P.), as well as Late Archaic (1300–600 cal B.P.) deposits that could not be further separated into smaller units of time. It is particularly noteworthy that many of these components have very narrow time frames, in many cases smaller than the traditional Great Basin periods. Much of the presentation in this volume is organized around these fine-grained components.

Following this introduction, we provide background discussions of the environmental setting and cultural context, the latter directed at prehistory and ethnography. This is followed by a description of field and laboratory methods, the former a summary of the WCRM effort, the latter a discussion of both the WCRM and Far Western programs. Project chronological controls are then established using mostly radiocarbon assays and an analysis of time-sensitive artifacts, primarily projectile points and beads. These data are then used to identify the aforementioned spatio-temporal components.

Detailed site reports were prepared for all prehistoric sites; however, only sites that were subject to large-scale excavations are contained in this volume, that is, the five sites with dated components described above. All other site reports, as well as all data analyses, are provided in the original technical report (McGuire et al., 2017). It should be mentioned that our understanding

TABLE 1
Sites Investigated as Part of the Prehistoric Study

Prehistoric Sites	Multicomponent Sites
26HU2472	26HU1826
26HU5441	26HU1830
26HU5448	26HU1876
26HU5479	26HU2871
26HU5487	26HU3118
26HU5627	26HU5443
26HU5628	26HU5446
26HU5635	26HU5459
	26HU5598
	26HU5621
	26HU5630
	26PE2464

of the geomorphology of each site benefitted from landform and stratigraphic descriptions developed during archaeological fieldwork by Tom Bullard of the Desert Research Institute. Tom provided photos and profile illustrations for many of the sites discussed herein.

The profile of projectwide time-sensitive projectile points and radiocarbon dates, coupled with a robust artifact and feature assemblage dated to narrow time frames allows for an assessment of changes in habitation and land-use pattern with an unusual level of resolution. The final section (Summary and Conclusions) includes discussions of the following research domains: Middle versus Late Archaic domestic/habitation patterns; the role of environmental change in trans-Holocene settlement structure; the rise of Middle Archaic residential stability and logistical hunting; patterns of obsidian conveyance; subsistence-settlement variation within the Late Archaic Period; and an assessment of the missing Terminal Prehistoric record within the project area.

ENVIRONMENTAL CONTEXT

The lowland basin of pluvial Lake Lahontan dominates the landscape of western Nevada's Northern Tier—the area of Nevada generally above the Sixth Standard Parallel (40.5° N) and north of the main stem of the Humboldt River and Interstate 80. The Hycroft Mine sits at the southeastern margin of the expansive Black Rock Desert—and Upper Lahontan Basin—which opens to the northwest onto what was once the Lahontan lake bed and today is the terminus of the Quinn River.

The study area surrounds the active mine and encompasses the mountain-front piedmont at the northern end of the Kamma Mountains along the southeastern margin of the Black Rock Desert. Complex, roughly north-south-trending fault lines (Adams et al., 1999) influence landform geometry and spring discharge along the interface between the piedmont and the abrupt mountain front of the Kamma Mountains. Recent mining activities at the Hycroft Mine focus on the erosional pediment of the upper piedmont with pit excavation extending to ore deposits deep within the rocks beneath the pediment surface. Leach fields and waste rock storage extends onto the alluvial fans below the Lahontan wave-cut highstand.

A broad apron of coalesced alluvial fans emanates from the uplifted and wave-cut pediment on the northwestern side of the small

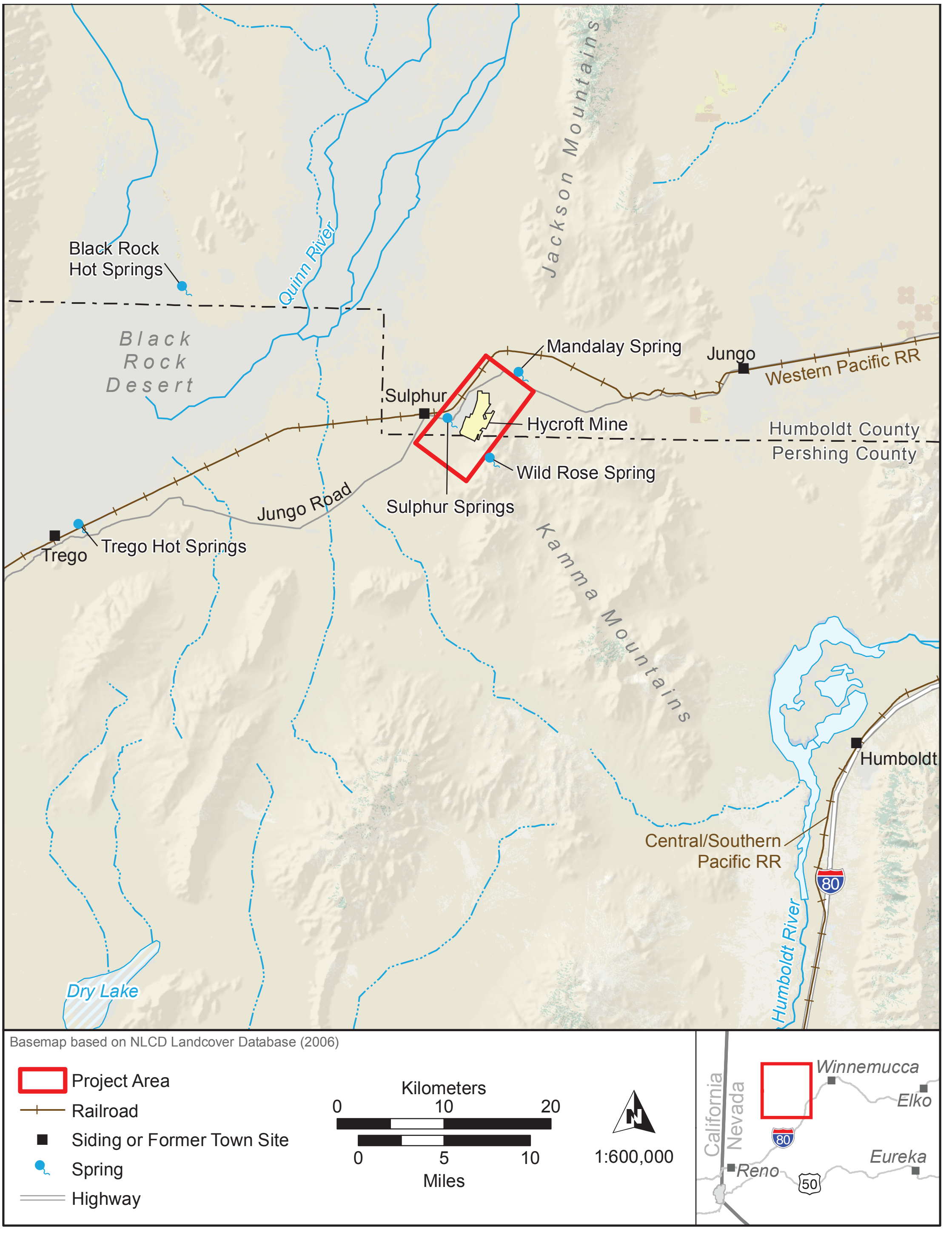


FIGURE 1. Study area vicinity.

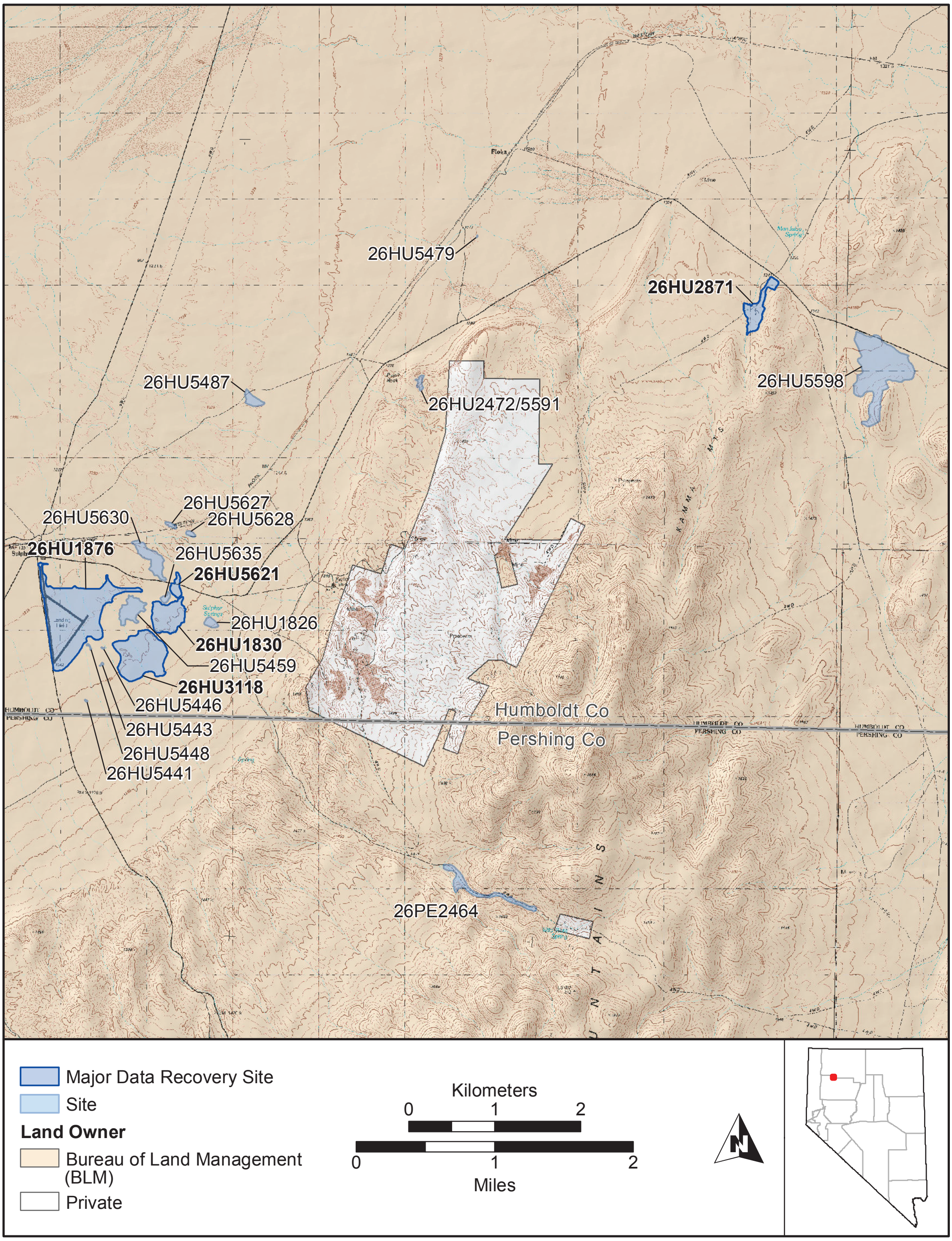


FIGURE 2. Map of sites within the study area.

mountain range. The fans interfinger with lake sediments laid down during highstands of pluvial Lake Lahontan, the expansive lake that once covered a large portion of northwestern Nevada, connecting many subbasins when at its deepest. Strandlines and former beaches of the pluvial lake reach to approximately 4410 ft (1345 m) in elevation; the actual highstand lake elevations may have been lower due to local variability in isostatic rebound. Recessional strandlines form concentric patterns extending basinward from the wave-cut pediment. With a few exceptions, most of the archaeological sites discussed in this report occupy aeolian dune and alluvial fan landforms inset below the pluvial high strandline.

The alluvial and lacustrine sediments are locally capped by sinuous dunes and broad sandsheets. Now-dry beaches, alluvial fans, and the expansive lake bed provide the silt and sand to build the generally active dunes. A large area of weakly parabolic-to-linear dunes, here informally referred to as the Sulphur Springs dune field, have coalesced in the area of Sulphur Springs below highstand strandlines along the mountain front. Elsewhere, linear dunes are anchored on interfluvial ridges that divide ephemeral fan and spring-discharge drainages emanating from lineaments on the piedmont.

Spring or groundwater discharge along fault lines likely played a significant role in periods of human settlement and use at the basin margins. Discharge at Sulphur, Mandalay, and Wild Rose springs, along with several unnamed springs and seeps, undoubtedly fluctuated with recharge environments throughout the Holocene. In addition to the spring point-sources, outflow from the springs, especially downstream from Sulphur and Mandalay springs, may have formed locally productive wetland or paludal environments; distributary discharge channels and local spring mounds form prominent breaks in the local strandline sequence. In the area of Sulphur Springs, a dune system caps formerly active channel and wetland habitat.

Modern Climate

The continental climate of the Great Basin alternates between hot-dry summers and cold, relatively wet winters, influencing the biological, geomorphological, and cultural environments of the study area. While seasonal changes in temperature cycle annually, seasonal moisture, while similarly cyclical, varies considerably year to year because the orographic effects of bounding mountain ranges can be amplified by winters dominated by strong high pressure over the Great Basin. While a review of data from the Western Regional Climate Center reveals a general pattern of dry summers (July to September) alternating with relatively wet winters and springs (November through May), some years can have stronger June and July monsoonal rains and others can have deep winter snowfalls accompanying very wet storm systems. The patterns in this generally arid environment may depend on ocean current and temperature patterns in the Pacific Ocean, also known as the El Nino and La Niña circulation patterns.

The project area is basically at the midsection of a line between Gerlach and Imlay, Nevada. Weather stations at these locations (Western Regional Climate Center, 2016) show average winter daily maxima between 41° F (5° C) and 42° F (6° C) in December and January. Imlay, along the Humboldt River, has typically lower minimum winter temperatures in the teens (17° F [-8° C] in January), while Gerlach is slightly warmer at just above 20° F (-7° C). Inversions can be strong in the Black Rock basin, so winter cold periods can be long lasting. Across the region, winter precipitation is typically about three inches in the winter months and repeaks to similar amounts in May as a result of late spring storm systems. While winter storms can produce locally deep snow, snow measurements never average more than one inch (2.5 cm) per month.

Summer temperatures between Gerlach and Imlay reach an average daily maximum of 93° F (34° C), though daily summertime temperatures exceeding 100° F (38° C) are not uncommon in the Black Rock. Nighttime average minima range between 59° F (15° C) and 57° F (14° C), at Gerlach and Imlay, respectively, bringing some relief from daily heating. As is common in arid desert and steppe environments, rainfall averages less than an inch in the summer months.

Modern Fauna and Flora

The arid, continental climate supports a generally depauperate steppe environment on the hills of the Kamma Mountains and the margins of the Black Rock Desert playa. A desert shrub community of black greasewood (*Sarcobatus vermiculatus*), shadscale and saltbush (*Atriplex* sp.), spiny hopsage (*Grayia spinosa*), littleleaf horsebrush (*Tetradymia gabrata*), and bud sagebrush (*Artemisia spinescens*) forms generally open vegetation cover on hillslopes. Dispersed within this community are also local plants of ephedra (*Ephedra viridis*), prince's plume (*Pappostipa speciosa*), and prickly gilia (*Leptodactylon pungens*; Harmon et al., 2011: 10). In the Sulphur Springs dune field, big sagebrush (*Artemisia tridentata* and *A. tridentata wyomingensis*), rabbitbrush (*Chrysothamnus viscidiflorus*), and Indian ricegrass (*Orysopsis hymenoides*) anchor the dunes; rabbitbrush and ricegrass are especially common in areas of active or disturbed dunes. Baileys greasewood (*Sarcobatus baileyi*) and saltgrass (*Distichlis spicata*) increase as the dunes transition to alluvium and silt plains of the playa margin.

Moist areas around local springs host saltgrass, occasional rushes (*Scirpus* sp.), and isolated willow trees (*Salix* sp.). Most of the springs, however, have been historically altered and trees and other vegetation may be a result of relatively recent development. Invasive species colonizing areas within and surrounding the project area include cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), and Russian thistle (*Salsola* sp.; Bureau of Land Management, 2011). Tamarisk (*Tamarix* spp.), also an invasive plant species, is found in small numbers in the area.

The modern fauna is predominantly small mammals, reptiles, and birds, but larger fauna in the area include pronghorn (*Antilocapra americana*), coyote (*Canis latrans*), and historically introduced horses (*Equus* sp.). Small mammals are especially common in the dune fields and loess, and in the alluvium of slopes and valley fills. These include black-tailed jackrabbits (*Lepus californicus*), badgers (*Taxidea taxus*), pocket mice (*Perognathus parvus*), kangaroo rats (*Dipodomys ordi*), and ground squirrels (*Spermophilus leucurus*). Lizards and snakes are dispersed throughout the local slopes and into the dunes. Prairie falcons (*Falco mexicanus*) and golden eagles (*Aquila chrysaetos*) nest in the region, and smaller passerine birds are common.

Environments of the Latest Pleistocene and Holocene

Lake Lahontan likely reached its late Pleistocene highstand for a brief period at about 17,600 years ago (Benson et al., 1990; Adams and Wesnousky, 1999; Benson, 2004; Adams et al., 2008; Grayson, 2011). The duration of the highstand is unclear, but by 15,400 cal B.P., the lake was retreating from its maximum (Adams and Wesnousky, 1998). Between 14,500 and 13,000 years ago, the lake had dried to such an extent that the Black Rock Desert and Quinn River drainage system was isolated from Sierran connections through the Pyramid Lake and Honey Lake subbasins, as they have been for much of the Holocene (Adams et al., 2008). At around 12,600 years ago, the lake in the Black Rock subbasin was likely rising again, due to renewed input from the Quinn River in response to increased precipitation resulting from a local expression of the early Younger Dryas cycle. To further complicate the local lake-level chronology, Davis (1982) and Benson and Peterman (1996) show that the Humboldt River connected to the Black Rock, via Desert Valley and the Quinn River, sometime after 15,000 years ago.

The extent of the Younger Dryas lake in the Black Rock subbasin at the Late Pleistocene–Holocene transition, just prior to 12,200 years ago, remains unclear, but it may have reached as high as 1230 m (4035 ft; Adams et al., 2008). At this elevation it would have approached the piedmont of the Kamma Mountains but remained northwest of the current study area. It is likely that, with the lake receding, the Quinn River formed a large distributary delta supported by groundwater discharge and, possibly, the Humboldt-Quinn River connection. Meander scrolls and paleochannels evident in the east arm of the Black Rock playa may be evidence of the former delta. Early archaeological assemblages near the study area (Clewlow, 1968) may be evidence of human use of the Younger Dryas lake and delta. While generally drying, the Younger Dryas interval was a time of high-amplitude cycling and short-term transitions of temperature and precipitation as regional climate sought a postglacial equilibrium and local environments adapted to changing conditions.

Although local conditions can vary and the drivers and proxies used to document regional changes are many, the general pattern of environmental change during the Holocene is important for interpreting the archaeological record in and around Sulphur Springs. Tausch et al. (2004: 28–29) show that ice-rafting, whereby glacial ice calving from continental margins of the northern Atlantic Ocean contributes terrestrial sediment to ocean cores (Bond et al., 2001), is a useful proxy indicator for global climate changes that have local environmental and hydrological impacts (Miller et al., 2004). Figure 3 shows the oscillating pattern of the input of fine-grained terrestrial sediment in cores in the Atlantic Ocean. Cool periods with low solar activity produce ice-rafting, allowing the transport of terrestrial sediments further into the northern Atlantic Ocean. Conversely, warm periods with high solar activity produce less ice-rafting and less terrestrial sediment contribution in deep core records. This oscillating pattern during the Holocene shows a general downward (or warming) trend in ice-rafting during the Holocene—this cycling may provide a significant proxy for local response to global atmospheric conditions (Mensing et al., 2004: 36; Miller et al., 2004; Tuasch et al., 2004). For example, the Early Holocene thermal maximum (shown by a sediment minimum) at about 8800 cal B.P. corresponds to the final drying of larger basins throughout the north- and east-central Great Basin (Madsen et al., 2015; Rhode, 2016), elevated summer temperatures in high elevations (~9000 ft [~2750 m]; Minckley et al., 2007), expansion of pinyon in central Nevada (Wigand and Rhode, 2002), and disappearance of springs in the southern Great Basin (Quade et al., 1998; Mensing, 2001).

Early Holocene (11,700–8500 cal B.P.): The Early Holocene begins about 11,700 years ago as postglacial climate patterns are fully established, and nonglacial landscapes and drainage systems become dominant. Lake basins and their deltaic wetlands however, may have lagged with groundwater support into the Early Holocene. With the gradual drying of lake basins, dust and dune deposits developed, taking the form of new silt mantles and sand dunes on valley margins. The Humboldt River, once carving great meanders as it returned to its modern sink, became a less competent stream by about 10,800 years ago and, for a time, deposited a wet floodplain that filled the larger paleomeander scars (Miller et al., 2004). Floodplain aggradation through the Early Holocene is evident across northern Nevada (Young, 2015). While the Upper Lahontan Basin and regional floodplains remained generally wet (Benson et al., 2002; Benson, 2004), if regional trends of the Early Holocene are any indication (Rhode, 2016), a grass and sagebrush steppe community replaced juniper woodlands in foothills of the Jackson Mountains and expanded into midland elevations surrounding the Black Rock, including the Kamma Mountains. Juniper communities retreated to uplands throughout the region, especially in the High Rock Country northwest of the Upper Lahontan Basin (Wigand and Rhode, 2002: 323). While these changes occurred in floodplains and along the mountain fronts, marshes and wetlands expanded in the northern Great Basin (Wigand and Rhode, 2002), and probably at the terminus of the Quinn River, in adjacent valley bottoms, and within

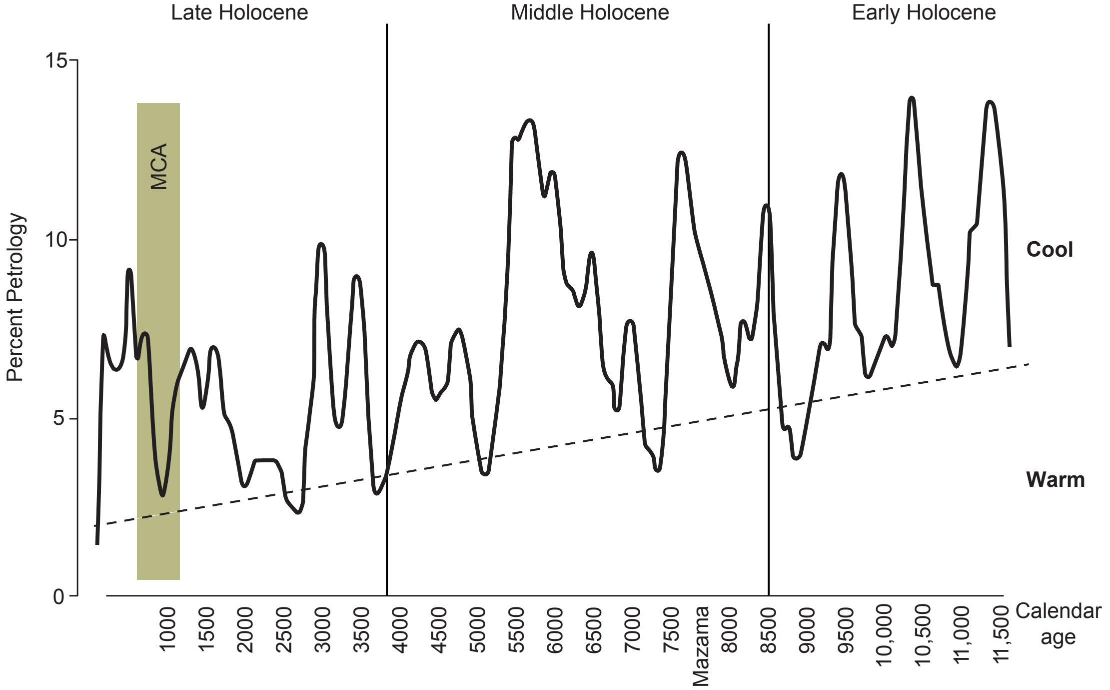


FIGURE 3. General climate divisions of the northern tier with North Atlantic drift ice records (Bond et al., 2001). Note: Medieval Climate Anomaly (MCA) highlighted. Warm periods of limited drift ice in the north Atlantic, reflected by reduced terrestrial sediment (percent petrology) in deep ocean cores, may correlate with regional droughts (Mensing et al., 2004).

spring discharge mosaics such as those at the foot of the Kamma Mountains (e.g., Sulphur and Wild Rose springs). The regional Ivanhoe paleosol (Young, 2015) formed on moist floodplains, on regional loess and dune deposits eroded from drying lakes, and on some young fan deposits stable since the end of the Pleistocene.

The region dried slowly with continued wet pulses through the Early Holocene. Valley bottoms and margins transitioned from sagebrush steppe to greasewood and saltbush plains. Near the close of the Early Holocene, there are also strong indications of increased summer temperatures beginning at about 9300 years ago (Minckley et al., 2007) when there is a relatively close correspondence between a global thermal maximum (Kutzbach and Webb, 1993) and early Holocene nadir in the sediment transport in the north Atlantic (see fig. 3; Bond et al., 2001: 2131). However, an intensification of monsoon moisture that might correlate with a regional thermal maximum (Kutzbach and Webb, 1993: 9) does not seem to have spread to northern Nevada (Rhode, 2016); this may have been due to the lagging effects of northern glacial ice disrupting regional circulation patterns. However, the close of the period is marked by erosion and scouring of the Ivanhoe paleosol in many upland and midland alluvial basins (Young, 2015), and local fans may have prograded significantly with this scoured alluvium. This may indicate a strong monsoonal or punctuated winter storm cycle within otherwise dry conditions that mark the beginning of the Middle Holocene.

The Mazama tephra rests unconformably and commonly on eroded floodplains and at the base of many dunes (including the Sulphur Springs dune field). The tephra makes a clear boundary marker, though the Early to Middle Holocene transition slightly predates the geologic event of the eruption and is encapsulated in the floodplain erosional break and valley-bottom deposition that may have resulted from heightened storm pulses under generally dry conditions.

Middle Holocene (8500–3800 cal b.p.): Persistent drought, lasting centuries or more, marks the onset of the driest period of the Holocene. Recently analyzed stable isotope and elemental records from cave stalagmites in eastern Nevada confirm pronounced Middle Holocene drying (Steponaitis et al., 2015). As desert scrub communities spread and monsoonal rains are absent, even in the distant south, dry conditions prevail until at least 6300 years ago (Mensing et al., 2004). Annual precipitation, even at the highest elevations, decreased to such an extent that Lake Tahoe dropped below its natural outlet for extended periods and trees colonized areas up to 4 m below the sill level (Lindström, 1990). In fact, most floodplains were capped by aeolian silt and rivers may have dried completely (Miller et al., 2004). While Holocene-age dunes started forming as early as the Early Holocene in several drying lake beds, dune systems became more organized and widespread in the early Middle Holocene.

The Sulphur Springs dune system is underlain by alluvium and mixed Mazama tephra, an indication that significant aeolian sand deposition on the landscape of the study area began in the early Middle Holocene. It is likely that as the local dunes developed, the Quinn River and other Black Rock drainages rarely flowed toward the expanding playa, although a few local springs may have supported limited discharge lagging behind the persistent dry conditions.

After 6300 years ago, moisture returned rehydrating the northern reaches of the Black Rock and helping sagebrush communities expand at the expense of desert shrubs. The increase in moisture appears first in the northern Great Basin, possibly wrapping into Nevada's Northern Tier. Trees still occupied areas below the natural sill of Lake Tahoe, but after about 5000 years ago, rising waters flooded the forests below the sill and Pyramid Lake began to rise (Mensing et al., 2004). The Humboldt River, and probably the Quinn River, formed a new alluvial floodplain (Miller et al., 2004), reworking silt washed from hillslopes in tributary drainages. In general, the late Middle Holocene saw wetter conditions increase, as droughts, while still prevalent, became less persistent and of shorter duration (Rhode, 2016).

Late Holocene (3800 cal b.p. to present): By about 4000 years ago, regional moisture increased and stabilized to influence a wide range of plant communities and alluvial systems. The beginning of the Late Holocene marks the so-called Neopluvial corresponding to the return of relatively large lakes and marshes in many basins. Pollen records across the region show pervasive cool and moist conditions, and there are peaks in North Atlantic drift-ice sediment (see fig. 3) suggesting global drivers that may have included changes in currents in the Atlantic (cooling) and Pacific (warming) oceans. Pollen records at Diamond Pond (Wigand and Rhode, 2002) and Mission Cross Bog (Norman, 2007), north and east of the Black Rock Desert, respectively, show widespread moisture with rises in water levels, aquatic vegetation (local pollen), and pine production (distant pollen). The Humboldt River flowed in earnest, creating expansive overbank levees, supporting lakes and wetland environments in the Humboldt Sink (Miller et al., 2004), and possibly overflowing to the Carson Sink. The Quinn River may have once again brought significant and steady flows to the east arm of the Black Rock. Although the general steppe vegetation in the Kamma Mountains and along the basin margins likely did not change significantly, local habitats undoubtedly bloomed. Springs flowed again as new moisture recharged groundwater basins. While few details are known about Late Holocene vegetation at the local springs, discharge drainages around the springs may have supported bulrush and tules, which are evident in settings at Trego and Black Rock hot springs at the margins of the modern playa. Seed-bearing grasses and shrubs likely colonized stabilized dunes evident in multiple buried soils throughout the dune field. Avian and terrestrial fauna may have returned in significant numbers as grasses and water sources stabilized. All in all, the landscape of the Northern Tier, including the margins of the Lahontan Basin and Black Rock playa, experienced a pervasive florescence of productivity unseen for millennia before or since.

The florescence came to a relatively abrupt end as persistent, cyclical drought conditions reduced lake levels, forced hillslope erosion, and reactivated dunes at about 2600 years ago (Mensing et al., 2004). It is at about 2600 cal B.P. that intensive, high-amplitude fluctuations between dry and moist conditions, with decadal droughts punctuated by relatively persistent wet periods, became the norm across the Northern Tier. Part of this is reflected in a series of high-resolution paleoenvironmental records obtained from cores and packrat middens, and may correspond to the development of a strong, dipole between opposing atmospheric conditions (Mensing et al., 2008; Wise, 2010). Small shifts in the dipole might result in very different paleoenvironmental indicators at any given location. In fact, the position of the dipole in space and time across the Northern Tier may have resulted in precariously unpredictable and rapid fluctuations in local environmental conditions. Nearby areas, such as the Upper Humboldt River drainage and the northern Lahontan basin, may therefore have experienced very different moisture and environmental regimes in the same period of time.

As droughts intensified, monsoonal storms moved into the northern Great Basin at least as far as Diamond Pond (Wigand and Rhode, 2002), pervading the Northern Tier and, likely, the Black Rock Desert region. Summer rainfall would encourage grass communities even within pervasive drought conditions.

While the drought at about 2000 cal B.P. may have been particularly intense, the fluctuations of the Medieval Climate Anomaly (MCA) may have brought rapid changes of higher amplitude (Stine, 1990, 1994). Drought conditions may have lasted for centuries (1100–900 cal B.P. and 800–650 cal B.P.) but were separated by moisture peaks—evident in the latter portion of figure 3 (see also Mensing et al., 2004: 36). In the vicinity of the Black Rock Desert, a pollen record from Blue Lake in the Pine Forest Range (Carter, 1995) shows very dry intervals accompanied by increased fire frequency at 550 to 440 years ago and again about 300 years ago. The records emphasize the fluctuating conditions, possibly due to shifting dipole conditions, common across the Northern Tier generally, and the Black Rock Desert and Sulphur Spring's dune field, specifically.

The droughts and occasional monsoonal rains of the latter part of the Late Holocene established and reinforced the dry steppe environment and the pervasive greasewood-shadscale vegetation community evident in the modern landscape of the Sulphur Springs dune field and Kamma Mountains (i.e., the current study area). Late spring rains and intense but sporadic summer storms allowed grasses to bloom occasionally in the active dunes. Spring vegetation may have all but disappeared until historic-era modifications (e.g., wells and diversions) produced ditches and ponds. Even with development, however, well-watered patches remained limited in the increasingly dry landscape due to drought conditions that have outplayed the rare moist pulses since the MCA.

CULTURAL CONTEXT

The following discussion reviews the prehistoric and ethnographic contexts of the Black Rock region. The prehistoric context begins in the Late Pleistocene/Early Holocene when pluvial Lake Lahontan was the focus of human habitation and continues forward until ethnohistoric times. It is organized according to a series of broad temporal periods, and focuses on critical artifact assemblages, features, subsistence remains, and land-use reconstructions generated by previous studies in the northwest Great Basin.

Ethnographic information from the Northern Paiute is then presented with the goal of documenting season-to-season subsistence pursuits of the people. These activities and their linkages to higher level land-use patterns and sociopolitical organization provide a better understanding of how economic systems operated during the past few hundred years and how they may have differed further back in time.

Prehistoric Context

As the most thorough examination of Northern Nevada prehistory has recently been completed as part of the Ruby Pipeline Project (Hildebrandt et al., 2016), and because it was produced by many of the same authors of the this study, the following Prehistoric Context borrows heavily from the context discussion developed for the Ruby Pipeline effort. Periods and time intervals are the same, but the discussion has been modified to focus more on northwestern Nevada. In addition, the most important findings from the Ruby Pipeline program have been incorporated in this background discussion.

Paleoindian Period (14,500–12,800 cal b.p.): Although direct evidence of Paleoindian occupation has not been documented within the project area, the margins of ancient pluvial lakes are typical contexts for such occupation. It is likely, therefore, that lacustrine, riverine, and other wetland zones associated with the Black Rock region of Lake Lahontan at the Pleistocene/Holocene transition were used by human populations.

Until relatively recently, most archaeologists believed that artifacts produced by Clovis people represented the oldest evidence of human occupation in North America. These artifacts typically include fluted projectile points, large bifaces, and a variety of formal flake tools. Now, this search for the oldest inhabitants of North America and Great Basin has expanded to include so-called pre-Clovis peoples, and many archaeologists have claimed such a discovery. Below, we review evidence for both pre-Clovis and Clovis occupation in the Great Basin.

The most solid candidate for pre-Clovis occupation in this region is the archaeological deposits at the Paisley Five Mile Point Caves. They are located in the northwestern Great Basin on the margins of Summer Lake Basin, about 75 km north of Lakeview, Oregon. Paisley Cave #5 has a deep stratified deposit that includes a lower component dating from about 14,500 to 14,100 cal b.p. (12,400 to 12,200 radiocarbon years before present), which predates the earliest estimates by Haynes (1992) for Clovis by 700 years. This component includes Pleistocene megafauna, as well as bifaces, debitage, cordage, butchered bone, and human coprolites, the last documented by the presence of human DNA. Multiple radiocarbon dates were obtained from the human coprolites (Gilbert et al., 2008; Hockett and Jenkins, 2013; Jenkins, 2007; Jenkins et al., 2012, 2013). While there has been some dispute of these findings (Goldberg and Macphail, 2009; Poinar et al., 2009), the case for a pre-14,000 cal b.p. human occupation at the site seems quite strong (see also Grayson, 2011, for a discussion of the site).

Although unequivocal evidence for pre-Clovis people is quite rare, and documented only in areas to the north, it seems possible that people were present in northern Nevada at this time. It is important to emphasize that if these people used simple flaked stone technologies similar to those used later in time (i.e., lacking distinctive attributes like fluted points), it might be difficult at first glance to spot archaeological materials dating to the Pleistocene.

Fluted points are relatively common in the Great Basin and the larger intermontane west, but less plentiful than east of the Rocky Mountains and in the Southwest. The vast majority of points found in the Great Basin are from surface contexts lacking material suitable for radiocarbon assay, and none have been associated with the remains of Pleistocene megafauna. They usually occur in isolated contexts but are sometimes found in major concentrations, the most important being in the Alkali Lake Basin of southeastern Oregon (Fagan, 1988; Pinson, 2004, 2011), the Sunshine Locality of eastern Nevada (Beck and Jones, 1997, 2009, 2010), and Pleistocene Lake Tonopah in western Nevada (Pendleton, 1979; Tuohy, 1988). These concentrations show that fluted points are often associated with bifacial blanks, knives, scrapers, and gravers, but not milling tools. Both the isolates and concentrations are typically found in areas that contained shallow, marshland habitats, while they almost never occur in upland settings.

Although some researchers have assumed a large-game hunting orientation during Clovis times in the Great Basin, based on findings from the Great Plains and Southwest, Heizer and Baumhoff (1970) noted early on that the close association between fluted points and lake basins seems to indicate an adaptation to lacustrine resources rather than big-game hunting. Madsen (2002) agrees, arguing that populations dating to this early time period followed a lowland strategy that focused on higher-ranked marsh resources, following an adaptation much like later Archaic people but without the extensive grinding of seeds. Recent research by Pinson (2011) in the Alkali Lake Basin, located along the northwestern edge of the Great Basin, provides strong support for this hypothesis. There is, however, not a consensus on this issue, with some advocates arguing for at least some reliance on large game (Elston et al., 2014).

Based on an analysis of radiocarbon dates from these ancient sites from across North America, Haynes (1992) argues that the Clovis adaptation dates between 13,390 and 12,810 cal B.P. (see also Haynes et al., 2007), while Waters and Stafford (2007) argue for a more narrow range of 12,960 to 12,740 cal B.P. The precise age of fluted points in the Great Basin, however, remains an open question due to the lack of specimens associated with reliable radiocarbon dates (Beck and Jones, 2010; Grayson, 2011). Although Pinson (2011) argues that the projectile points from the Dietz site are essentially identical to Clovis points found farther east, Beck and Jones (2010) found that fluted points from the Great Basin are sometimes smaller than Clovis points, and tend to have deeper indentations on their bases. They also note that Great Basin assemblages often lack the blade technologies often associated with classic Clovis sites of the Great Plains and the Southwest. As a result of these findings, Beck and Jones (2010) argue that the Great Basin samples should be classified as Western Fluted points and not Clovis. They also hypothesize that these forms were probably derived from Clovis and arrived in the Great Basin later in time. Given the lack of robust chronological data for Western Fluted points, however, it is difficult to evaluate the temporal accuracy of their proposal.

PALEOARCHAIC PERIOD (12,800–7800 CAL B.P.): Paleoarchaic archaeological sites are much more common than Clovis sites, and are marked by Great Basin Stemmed projectile points, large bifacial knives, crescents, gravers, scrapers and, in rare cases, handstones and millingslabs. The Great Basin Stemmed series includes a variety of regional variants (e.g., Cougar Mountain, Parman, Lind Coulee, and Windust; Layton, 1979), some of which have been identified within the project area. They are characterized by weakly shouldered specimens with long, square-to-contracting stems that are often edge ground. Flaked stone crescents are also diagnostic of this time period and, as with the projectile points, exhibit grinding along their concave and convex surfaces but not on their tips (see Sanchez et al., 2017).

Most researchers have traditionally thought that Great Basin Stemmed sites postdate Clovis, which is consistent with the post-12,800 cal B.P. age of the Paleoarchaic Period used here (Fiedel and Morrow, 2012). Beck and Jones (2010, 2012), following in the footsteps of Bryan (1979), have critiqued this position, arguing that stemmed points can be older than Clovis and reflect an entirely different culture that may have entered North America via a coastal route. This hypothesis is quite intriguing, particularly given the ancient findings at Paisley Caves outlined above, but an analysis of numerous radiocarbon dates from stemmed point components show that only a minority overlap with Clovis, and only Paisley Caves and Cooper's Ferry are good candidates for a pre-Clovis age (Beck and Jones, 2010; Goebel and Keene, 2014; Smith and Barker, 2017).

Early Holocene subsistence economies continued to focus on marshland habitats, but the addition of a few ground stone tools in a limited number of locations appears to signal a widening of the diet, perhaps in response to the aridification of the northern Great Basin at this time (Rhode, 2000; Madsen et al., 2001; Wigand and Rhode, 2002; Grayson, 2011). A more intensive subsistence economy is also reflected by a variety of settlement-pattern shifts, with people exploiting resource patches that had never been used before. Multiple rockshelters located away from wetland areas were occupied for the first time (Beck and Jones, 1997; Graf, 2007), as were upland areas along the Sierran-Cascade front. With regard to the latter, substantial Paleoarchaic occupations have been recognized in the Lake Tahoe/Truckee region (McGuire et al., 2006).

Due to the dominance of tools assumed to be associated with hunting and butchering, some researchers argue that large game must also have been a primary subsistence resource during the Paleoarchaic (Amick, 1997; Elston and Zeanah, 2002; Elston et al., 2014). This position has not been borne out by the vast majority of archaeological sites with faunal remains (which are much more prevalent relative to the earlier Clovis interval), as these assemblages are dominated by small mammals, birds, fish, and insects, and have only minimal contributions from large game (Layton, 1970; Thomas, 1970; Grayson, 1988, 1993; Hockett, 2007; Madsen, 2007; Pinson, 2007; Broughton et al., 2008; Grayson, 2011; McGuire et al., 2016). There is also some evidence that a sizeable percentage of flaked stone tools found at sites dating to this time may have been more directly related to the acquisition of marsh plant resources (McGuire and Stevens, 2017). Although ground stone tools remained rare before 10,200 cal B.P., they increased thereafter, particularly after 7800 cal B.P.

Despite the broad-spectrum character of these adaptations, an analysis of flaked stone material types has led many researchers to conclude that Paleoarchaic settlement systems relied on a high degree of residential mobility (Kelly and Todd, 1988; Amick, 1996; Jones et al., 2003; Goebel, 2007). For example, using the geographic distribution of obsidian artifacts to reconstruct conveyance zones, Jones et al. (2003) define three conveyance zones/foraging territories that overlap the project area. All three cover extremely large territories, ranging between 46,000 and 107,000 km^2, extending from the northern Nevada border down to the central and south-central portions of the state. Smith's (2010) more recent analysis of data from northwestern Nevada found that the Jones et al. (2003) reconstructions were much too large (see also Beck and Jones, 2011; Jones et al., 2012). He suggests a conveyance zone less than half the size of what Jones et al. (2003) estimated. Results from the Ruby Pipeline project (King, 2016) are in broad agreement with these earlier findings with King's procurement premium statistic for projectile points reaching its highest Holocene level in the High Rock area during the Paleoarchaic Period.

Even with the reduced size of the Paleoarchaic settlement systems proposed by these researchers (Smith, 2010; Beck and Jones, 2011; Jones et al., 2012), they are still more than 10 times larger than the largest systems observed in the worldwide ethnographic record (Kelly, 2011). The reliance on wetland plants, birds, fish, and small mammals also indicates that high levels of mobility would make little sense, as these resources would be difficult to deplete from a local basin. This led Madsen (2007) to hypothesize that high toolstone diversity could have resulted from long-distance logistical forays by hunters and/or the congregation of distinct populations during "jamborees," when people got together to share information, exchange goods, and find mates. Although few have seriously investigated this alternative perspective, it has received some mention in a few recent publications (Beck and Jones, 2012).

Despite the fact that most of the identified Paleoarchaic sites are surface phenomena, a buried house floor, dated to 11,189 cal B.P., was recently excavated in the Parman Basin as part of the Ruby Pipeline project (Hildebrandt et al., 2016; Ruby, 2016). This represents one of the oldest domiciles ever found in the Great Basin. The floor zone contained a diversified flaked stone assemblage, as well as a handful of small mammal bone and several charred seeds. There are also some rockshelters that have produced rich assemblages of perishable items dating to this period. Much of this material appears to be part of a single, widespread Catlow Twining basketry tradition composed of rectangular mats and flexible bags (Baumhoff, 1957; Adovasio, 1986). This tradition is represented in early Holocene components in southeastern Oregon (e.g., Fort Rock and Paisley caves), as well as western Nevada, where direct radiocarbon dates ranging from ca. 10,500 to 10,200 cal B.P. have been obtained from specimens excavated from Shinner Site A and Horse Cave (Cressman, 1942; Connolly et al., 1998; Fowler and Hattori, 2011; Connolly et al., 2016; Smith and Barker, 2017; Camp, 2017).

Post-Mazama Period (7800–5700 cal B.P.): We assign the beginning of this time period to 7800 cal B.P., but recognize that the environmental and cultural changes associated with it vary considerably across the Great Basin. We favor the 7800 cal B.P. dividing line because: (1) there is no doubt that people no longer used Great Basin Stemmed points; (2) this was about the time of the Mt. Mazama volcanic eruptions that sent ash over wide areas of the northern Great Basin; (3) it generally corresponds to a continuance of middle Holocene drought conditions; and (4) it marks the appearance of Northern Side-notched projectile points and a wholly different adaptation than what had come before.

A number of researchers have speculated that middle Holocene climatic warming may have either reduced human populations or led them to totally abandon the central Great Basin during this period (Baumhoff and Heizer, 1965; Layton, 1985; Beck, 1995; Schroedl, 1995; Milliken and Hildebrandt, 1997; Grayson, 2011; Beck and Jones, 2012). These conditions appear to have been most severe, and their effects on human populations most extreme, between ca. 8500 and 6300 cal B.P., but it is likely that xeric conditions prevailed until ca. 4500 cal B.P. (Wigand and Rhode, 2002). In this scenario, better-watered areas along the western, northern, and eastern portions of the Great Basin—perhaps including the more well-watered regions of the Humboldt River watershed—may have sustained human occupation during this time or even acted as refugia for populations who once occupied the hinterland areas of the northern and central Great Basin (Milliken and Hildebrandt, 1997; McGuire, 2007; Louderback et al., 2011; Orvald and Young, 2015). Whatever the larger regional conditions were during the middle Holocene, it is reasonable to conclude that populations across the Great Basin, including the study area, were subject to increased levels of environmental and resource stress during this time.

As previously mentioned, the primary time-sensitive artifacts for this period are Northern Side-notched projectile points. They have been found in a variety of contexts in central and eastern Nevada, but most are found in an arclike distribution across the northern Great Basin (Delacorte and Basgall, 2012; Thomas, 2013). The northern distribution of Northern Side-notched points has led several researchers to suggest that these points are "ethnic markers" of more northerly populations who occupied the Columbia Plateau (O'Connell, 1975; Layton, 1985; Delacorte and Basgall, 2012). Along these lines, Chatters (2012) argues that the eruption of Mt. Mazama at around 7600 cal B.P., and the resulting tephra blanket across much of southern Oregon, had the effect of pushing Plateau peoples deeper into northern Great Basin. As Layton (1985) argues, these Plateau groups were eventually displaced by populations emanating from the south in the central Great Basin at the beginning of the Early Archaic Period.

Probably the most well-known Post-Mazama manifestation in the larger region is found in Surprise Valley, and is represented by a series of highly formalized, semisubterranean house structures. O'Connell (1971, 1975) includes these features in his Menlo Phase, dating between 7400 and 5200 cal B.P. Morphologically distinctive artifacts from this period, along with Northern Side-notched projectile points, include antler wedges, mortars with V-shaped bowls and pointed pestles, T-shaped drills, tanged blades, and flaked stone pendants. It should be emphasized, however, that the Surprise Valley variant of the Post-Mazama Period, with its formal earthen structures and unique assemblage profile, remains somewhat of an anomaly with regard to the more arid regions to the east and south. Notwithstanding the occasional presence of Northern Side-notched projectile points, the archaeological record in these areas is decidedly less dramatic, often characterized by small hunting camps and stoneworking areas.

Early Archaic Period (5700–3800 cal b.p.): Climatic conditions began to improve a little after 6300 cal b.p. and became significantly cooler and wetter between about 4500 and 2600 cal b.p. (Wigand and Rhode, 2002). The amelioration of drought conditions at the beginning the Early Archaic Period is marked by major changes in the archaeological record. Gatecliff and Humboldt series points became dominant throughout the region, largely replacing Northern Side-notched points. Millingslabs and handstones for processing seeds are quite common in Early Archaic components for the first time (Elston, 1982). It is also at this time that shell beads—most notably spire-lopped *Olivella* variants from the Pacific coast—made their way into the Great Basin, suggesting increased levels of exchange (Bennyhoff and Hughes, 1987).

In Surprise Valley, the large, semisubterranean earth lodges of earlier times were replaced by generally smaller brush wickiups, built atop comparatively shallow depressions (O'Connell and Ericson, 1974; see also Creger, 1991). Mortars with V-shaped bowls and pointed pestles apparently were replaced with U-shaped grinding bowls and flat- or round-ended pestles, and perhaps greater use of the millingstone (O'Connell, 1975). Subsistence remains suggest an increasing reliance on waterfowl, lagomorphs, fish, and other small animals that could be captured en masse with the aid of nets (James, 1983).

Recent work along the Ruby pipeline (Hildebrandt et al., 2016; see also McGuire and Stevens, 2016; McGuire et al., 2016) sheds the most light on this time frame, which in many ways was transformational for the prehistory of this region. Using the temporal profile of dated components identified along the pipeline, population densities are thought to have dramatically increased from Paleoarchaic and Post-Mazama levels (Hildebrandt and Ruby, 2016). This appears to have been, accompanied by a change in settlement structure emphasizing greater use of habitation sites, as opposed to a more limited hunting pose typically found during the Post-Mazama Period.

This increase in habitation and residential stability also seems to have fueled increases in large-game hunting, perhaps as a result of long-range logistical forays from these basecamps. Artiodacyl abundances in components from across the northern Great Basin dating to this time reach some of their highest levels. More locally, geophyte exploitation, primarily epos, in the High Rock Country north of the Black Rock Desert begins to intensify. In essence, many of the changes previously ascribed to slightly later in time during the Middle Archaic Period (see Middle Archaic discussion below) appear to have been well underway during the Early Archaic Period.

Middle Archaic Period (3800–1300 cal b.p.): As we mentioned above, many of the trends that characterize this period appear to have commenced at some point during the Early Archaic Period. When placed within a wider context, this period is seen across much of the Great Basin and California as having been a cultural florescence or "golden age." Along with the increasing sophistication in material culture, as represented by the Lovelock Culture in the western Great Basin, other dramatic developments include continued population growth and the further development of true settlement hierarchies, with the increased use of large semisedentary base camps (Hildebrandt et al., 2016; Young and Hildebrandt, 2017; see also McGuire et al., 2016). Land-use intensity of wetlands associated with the

Humboldt River also reaches its highest Holocene levels during this time (McGuire and King, 2011). Such large, semisedentary residential complexes have been documented along the Humboldt lake bed (Livingston, 1986), Carson Sink (Raven and Elston, 1988; Raymond and Parks, 1990; Kelly, 2001; Madsen, 2002), and the Humboldt River near Battle Mountain (King and McGuire, 2011). These findings are consistent with various excavations in the northwestern Great Basin, including the Honey Lake region and the Reno area, where large accumulations of Middle Archaic middens and artifacts have been identified at a series of ecological "sweet spots" (Elston et al., 1994; see also Riddell, 1960; McGuire, 1997; Young et al., 2009).

Along the western edge of the Great Basin, the most dramatic examples of this increased visibility are found at expansive midden complexes such as Karlo (CA-LAS-7; Riddell, 1960; Hughes and Bennyhoff, 1986), and adjacent base camps in Secret Valley (LAS-206 and LAS-1705/H; McGuire, 1997). These sites contain a proliferation of house structures, hearths, ovens, and burials, as well as some of the richest and most diverse assemblages of artifacts and subsistence remains identified in the region. Along the southwestern shore of Honey Lake, the recently identified Tufa Village Site (26Wa2640) contains the remnants of six house structures radiocarbon dated to between 2780 and 3830 cal B.P. (Young and Hildebrandt, 2017). Similar settlement elaborations have also been observed in Surprise Valley (O'Connell, 1971, 1975) and Massacre Lake (Leach, 1988), with the latter showing the rise of residential sites with midden for the first time. McGuire and Hildebrandt (2005; Hildebrandt and McGuire, 2002a) argue that the Middle Archaic Period may actually represent the "trans-Holocene highpoint" of residential stability in the nonagricultural areas of the Great Basin.

In terms of subsistence, this period has been associated with the continued emphasis on the logistical hunting of large game (Hildebrandt et al., 2016; see also Thomas et al., 1986; Hildebrandt and McGuire, 2002a; Broughton and Bayham, 2003; McGuire and Hildebrandt, 2005; McGuire et al., 2016; Young and Hildebrandt, 2017). The results have fueled a wider theoretical debate about the role of long-range logistical hunting by males in prehistoric and other traditional societies (Broughton and Bayham, 2003; Byers and Broughton, 2004; Hockett, 2005; Codding and Jones, 2007; Hockett, 2007; Jones et al., 2008; Broughton and Cannon, 2010; Jones and Codding, 2010; Winterhalder and Bettinger, 2010; Broughton et al., 2011; Simms et al., 2014; Fisher, 2015; Hildebrandt and McGuire, 2016; Hockett, 2016; Webb, 2017). This debate is rooted in human behavioral ecology and revolves around the question of whether the taking of large mammals is simply a reflection of efficient provisioning or a signal of participation in other spheres of culture only indirectly tied to subsistence, such as various prestige-garnering strategies that are thought to bestow on their participants—successful male hunters—greater individual fitness in the form of increased social attention, improved access to alliance networks, and ultimately expanded mating opportunities (McGuire and Hildebrandt, 2005).

In contrast to this focus on hunting by males at this time, the more intensive use of high-cost plants by women, as well as a tendency to locate base camps in settings that optimize women's foraging activities (Zeanah, 2004), may have compensated for the problematic energetics of large-game hunting. In dated components along the Ruby Pipeline corridor, the density of milling tools reaches its highest Holocene expression during the Middle Archaic Period. This is accompanied by increases in species diversity and richness in archaeobotanical assemblages dating to this time (McGuire et al., 2016).

It is likely that increased levels of habitation in this region of the Great Basin contributed to major shifts in flaked stone procurement and production. At nearby obsidian sources, including Massacre Lake/Guano Valley and Craine Creek, there was a shift from casual, low-intensity use to a more targeted and sustained procurement, with biface production peaking during the Middle Archaic Period (Hildebrandt et al., 2016). Interestingly, obsidian-source diversity reaches its lowest Holocene levels in northern Nevada at this time (King, 2016; see also McGuire, 2002b, 2007; Smith, 2007, 2010). In this scenario, rather than a more geographically expansive pursuit of toolstone that might be expected in a residentially mobile population, effort was directed more intensively at a fewer number of key source locations. Preliminary indications suggest that much of the obsidian in the current study area emanates from the Mt. Majuba source near Rye Patch. It remains on open question whether some of these processes and trends are applicable to this obsidian source.

As we mentioned at the outset of our discussion of the Middle Archaic, there seems to have been increasing sophistication in material culture and other cultural developments at this time. This is represented by the Lovelock Culture (ca. 4000–1000 cal B.P.) in the western Great Basin. The Lovelock Culture label was first coined by Loud and Harrington in 1929, based on their work at Lovelock Cave. It has been applied since by Heizer (1951), Heizer and Krieger (1956), Grosscup (1956), Bennyhoff and Heizer (1958), Heizer and Napton (1970), and Elston (1986) to many of the cave and cache assemblages from the lake areas of western Nevada. It is synonymous with a spectacular array of material culture—most notably perishable items—represented in many of the cave sites of this region. These sites often contain large numbers of baskets (e.g., various coiled forms, Lovelock Wickerware), nets, fur and bird-skin robes, mats, cordage, atlatls, darts, bone awls, ornaments, and finished projectile points, but little debitage or food waste. Also noteworthy in this regard, Bennyhoff and Hughes (1987) argue that trade of marine shell beads into the Great Basin from California reached its peak in the first part of the Middle Archaic, between roughly 3700 and 3400 cal B.P.

While early iterations of the Lovelock Culture emphasized trait lists, more recent studies have focused on its adaptive characteristics associated with riverine, lake, and other wetland habitats. At Stillwater Marsh, Raven and Elston (1988) document expansive middens replete with human burials, a high frequency of structures and features, flaked and ground stone artifacts, and a variety of marsh-taxa faunal remains (fish, waterfowl, shellfish, small mammals). These sites are in all likelihood semisedentary base camps from which long-range logistical forays emanated, and are generally consistent with our characterization of Middle Archaic lifeways. Several researchers have argued that the Lovelock adaptation, cross-cutting both the Middle and Late Archaic in the western Great Basin, was the result of wetland resource intensification (Raymond and Parks, 1990; Hildebrandt, 1997; King and McGuire, 2011). Madsen (2002) goes further, suggesting that this wetland adaptation (i.e., his “lowland adaptive strategy”) is instrumental in understanding prehistoric adaptations throughout the Great Basin.

As to the people representing the Lovelock Culture, Hattori (1982; see also Moratto, 1984; Fowler and Hattori, 2011) has noted many similarities with Windmilller and other California Central Valley cultures, postulating a transregional Penutian ethnolinguistic affiliation. Mitochondrial DNA studies conducted on both prehistoric skeletal remains and modern Native American populations lend further support to this hypothesis (Kaestle and Smith, 2001). Using skeletal material from the Stillwater and Pyramid Lake regions radiocarbon dated to the Lovelock time frame, Kaestle and Smith demonstrate that the remains are most closely affiliated with modern Californian Penutian speakers. Conversely, the Stillwater and Pyramid Lake skeletal populations show little statistical haplogroup affiliation with modern Numic groups. At least in the western Great Basin, so-called pre-Numic populations, including those peoples represented by the Lovelock Culture, may have had a strong genetic, linguistic, and cultural affiliation with central California.

Late Archaic Period (1300–600 cal B.P.): Most researchers would now agree that the period between 1300 and 600 cal B.P. was a time of profound cultural change in the Great Basin, possibly induced by severe drought (e.g., the MCA, ca. 1100 to 650 cal B.P.), population increases, resource intensification, ethnic displacements, changes in technology, social conflict, or some combination of these. Some of these changes are thought to have occurred in the latter half of this period after approximately 1000 cal B.P., thus potentially splitting the Late Archaic into an earlier phase, where conditions may have been more like the preceding Middle Archaic Period, and a later phase marked by environmental and social disruptions.

Our understanding of the Late Archaic is further complicated by the Great Basin projectile point sequence, which marks this period by a series of small corner-notched projectile points variously referred to as Rose Spring, Eastgate, or Rosegate. As a group, they signal the introduction of bow-and-arrow technology in the area but cross-cut the entire time period (i.e., there is no way to break up the Late Archaic Period into smaller temporal intervals using projectile points alone). There seems to be a great deal of regional variability regarding the temporal span of these point forms, both on the early and late ends of their tenure. Although a significant amount of debate surrounds the origin of bow-and-arrow technology (e.g., Ames et al., 2010; Hildebrandt and King, 2012), the majority of data show that it appeared first on the Columbia Plateau around 2300 years ago (Webster, 1980; Chatters et al., 1995; Ames et al., 1998) and along the Sierran/Cascade Front in the northwestern Great Basin at about 1800 cal B.P. (Hildebrandt and King, 2002), with progressively later (post-1400 cal B.P.) introductions elsewhere in the Great Basin. Rosegate points seem to have persisted a few hundred years beyond the post-600 cal B.P. close of the Late Archaic in much of the northwestern Great Basin, as well (Milliken, 2000; Hildebrandt and King, 2002; Delacorte, 2008; Delacorte and Basgall, 2012; Hildebrandt et al., 2016).

Unlike the continuity represented in the projectile points, basketry types and technology seem to have completely turned over sometime after 1000 B.P. within the western Great Basin. Gone is the several-thousand-year tradition of Lovelock Wickerware, replaced by various open, simple and diagonally twined forms, including the seed beater and triangular winnowing tray, multiwarp sandal types, and coiled basketry characteristic of the prehistoric and historic-period Numa. Based on these findings, many have concluded that some form of ethnic or cultural replacement also occurred at this time, perhaps in the latter half of this period or slightly thereafter (Bettinger and Baumhoff, 1982; Adovasio, 1986; Adovasio and Pedler, 1994). Recent radiocarbon assays on Numic-style twined basketry from the northwestern Great Basin returned dates of 401, 140, and 136 cal B.P. (Camp, 2017), supporting this relationship. But it is also important to note, that coiled basketry presumed to be quite late in southeastern Oregon has recently been radiocarbon dated to at least 2500 cal B.P., arguing against it being a signature trait of the Numa (Connolly, 2013). Despite these issues with coiled basketry, the population replacement model is supported by mitochondrial DNA studies that show a statistically different haplogroup affiliation between contemporary Numic groups in the western Great Basin and prehistoric skeletal populations found at Stillwater Marsh and Pyramid Lake (Kaestle and Smith, 2001).

Notwithstanding these changes, there is a variety of evidence to suggest that overall populations were expanding at this time in the northern Great Basin (McGuire et al., 2016), although this expansion appears to have been geographically variable. Thus, in the low basins of the Upper Humboldt Plains of the Ruby Pipeline corridor populations are expanding, whereas in the westernmost High Rock Country, population density actually appears to have fallen somewhat from Middle Archaic levels. Elsewhere, virtually every large excavation or survey project from the region reports Rosegate series points, when standardized for time, as the dominant form (Thomas, 1971; Livingston, 1986; Leach, 1988;

Thomas, 1988; Delacorte et al., 1992; Elston and Raven, 1992; Elston and Bullock, 1994; Hildebrandt and King, 2002; Delacorte, 2008; McGuire and King, 2011; Hildebrandt and King, 2012).

Often tied to population growth documented at this time is the concept of resource intensification; i.e., as population density approaches the carrying capacity of the environment, people will intensify their resource procurement by adding a variety of lower-ranked foods to the diet (Elston, 1986). Thus, for example, in the northwestern Great Basin and on the Modoc Plateau, there was a significant decline in the use of large game relative to small game during the Late Archaic (Carpenter, 2002), as well as a dramatically expanded use of upland habitats at about 1000 cal B.P. (Delacorte, 2002). The latter appears to have depended heavily upon the seasonal exploitation of root crops, such as epos, although as we have previously indicated, the expansion of epos procurement appears to have commenced much earlier, as documented in the High Rock Country of the Ruby Pipeline corridor (McGuire and Stevens, 2016).

Elsewhere along the Ruby Pipeline corridor, we see an expansion of Late Archaic residential sites, but the abundance of milling gear at these locations is much lower than at Middle Archaic Period sites. This change is accompanied by a slight drop in the diversity of plant macrofossils and minor increases in the use of large game (McGuire et al., 2016). These findings may show that residential activity was widely dispersed, with people occupying smaller sites for shorter periods of time and using a narrower suite of local resources.

Population dispersion and the focus on local resource use is also documented by flaked stone material profiles at Late Archaic sites along the Ruby Pipeline corridor, which show that locally available CCS was used more than obsidian for the first time in prehistory (Hildebrandt et al., 2016). This trend has usually been interpreted in other Great Basin contexts as reflecting some combination of local resource intensification, settlement contraction, and overall territorial circumscription (Basgall and McGuire, 1988; Elston and Budy, 1990; Gilreath and Hildebrandt, 1997; Bettinger, 1999; Smith, 2010). This change in raw material use along the Ruby Pipeline corridor is accompanied by change in lithic technology, where biface thinning is often replaced by simply converting flake blanks into finished tools through pressure flaking.

Settlement shifts have been also tracked by changes in obsidian source diversity. In the northwestern Great Basin and on the Modoc Plateau, Middle Archaic populations may have been targeting a few key quarry zones for the purpose of biface production, but by about 1000 cal B.P., this form of production had ceased, giving way to a more disparate pattern of toolstone procurement by more locally based populations that perhaps featured increased reliance on trade and exchange, as well as scavenging of older archaeological materials. Such a pattern apparently had the effect of increasing source diversity during this time (McGuire, 2002b; see also Chatters and Cleland, 1995; Smith, 2007, 2010; Smith et al., 2012). Along the Ruby Pipeline corridor, there are also slight increases in the transport premium of both obsidian projectile points and debitage over that observed during the Middle Archaic Period, although it is unclear whether these modest shifts are tied to these effects.

Terminal Prehistoric Period (600 cal B.P. to Contact): Terminal Prehistoric occupation of this region of the western Great Basin is generally thought to be associated with the arrival of Numic-speaking peoples who entered the area from a homeland near the desert margins of the southern Sierra Nevada (Lamb, 1958; Bettinger and Baumhoff, 1982; Madsen and Rhode, 1994; Kaestle and Smith, 2001). This would include the Western Shoshone to the east of the project area, and the Northern Paiute in the northwestern Great Basin. Signature artifacts of this period include Desert Series projectile points (i.e., Desert Side-notched and Cottonwood), and brownware pottery among the Western Shoshone.

As previously mentioned, several researchers (e.g., Delacorte, 1995; Bettinger and Eerkens, 1999; see also Holmer, 1986; Janetski, 1994; Reed, 1994) have posited that the Desert Side-notched variant represents an actual ethnic marker of the Numa in much the same manner as the unique basketry complex (i.e., Adovasio's [1986] Stage 5) identified in regional shelters and caves has been tied to the ancestors of the Northern Paiute and Western Shoshone. Furthermore, the ratio of Desert Series to Rosegate projectile points, which is a useful way to monitor the northward movement of Numic-speaking peoples, is 2.7 times higher in Western Shoshone territory than in Northern Paiute lands along the project corridor, indicating that the Shoshone arrived at a much earlier date than the Northern Paiute (Hildebrandt et al., 2016).

The arrival of the Numa represents an altogether distinct break with previous Archaic lifeways. For the very first time population densities actually appear to decrease in many areas of northern Nevada (McGuire et al., 2016). Many multicomponent village locations, such as those described for Surprise Valley (O'Connell, 1975; O'Connell and Inoway, 1994), the Humboldt Lake bed (Livingston, 1986), and Secret Valley (Riddell, 1960; McGuire, 1997), which contain large numbers of house structures that appear to have been constructed at various intervals throughout the late Holocene, show an abrupt reduction in Terminal Prehistoric residential activity (McGuire, 2002a).

Similarly, there is some evidence that certain productive habitats targeted by Middle and Late Archaic groups were used much less during the Terminal Prehistoric Period. For example, large-scale surveys of Humboldt River bottomlands near Battle Mountain (King and McGuire, 2011) document an abrupt decline of Desert-series projectile points relative to Middle and Late Archaic markers. In addition, site densities on post-700 cal B.P. floodplain and meander-belt landforms collapse when compared to those observed on older landforms (King and McGuire, 2011). These results are in keeping with a more dispersed land-use system that targeted a variety of new resources and habitats, but are also consistent with a small, family-band settlement structure that may not have left as visible an archaeological footprint.

Notwithstanding these developments, the Terminal Prehistoric Period is represented by the highest percentage of habitation components of any period along the Ruby Pipeline (McGuire et al., 2016). High ratios of milling equipment to flaked stone tools from components dating to the Terminal Prehistoric Period also characterize a number of locations in the northwestern Great Basin, including Secret Valley (McGuire, 1997), the Black Rock Desert (Seck, 1980), the Buffalo Hills region (Kolvet, 1995), and Duck Lake (Creger, 1991). This may explain why many Terminal Prehistoric settlements throughout this region have almost a "stand-alone" domestic quality about them, as might be expected by a series of very dispersed and short-term occupations by small family units. Work and domestic and residential activities appear to have been much less segregated during this time period, often reduced to a small apron surrounding a single house structure and/or hearth. This characterization is not unlike the ethnographic descriptions of Numic family bands provided by Steward (1938) and others.

Perhaps not surprisingly, given the dispersion of small residential camps into new or underutilized habitats, archaeobotanical richness and diversity reach their highest expressions during the Terminal Historic along the Ruby Pipeline corridor, most of this material reflecting small seed exploitation. The increased use of seeds has, in turn, been tied to use of pottery (Eerkens, 2004, 2008). This emphasis on small seeds is however more apparent in areas to the east occupied by the Western Shoshone, whereas the exploitations of root crops may have played a larger role in the northwestern Great Basin.

Somewhat unexpectedly, an analysis of a variety of northern Great Basin faunal assemblages from the Ruby Pipeline and from other sites shows that the frequency of large game use continued unabated into the Terminal Prehistoric Period (McGuire et al., 2016). There are, however, several large-scale animal drive features that are commonly found across Nevada that may have contributed to this pattern (Ruby, 2016; see also Hockett, 2005; Hockett and Murphy, 2009; Hockett et al., 2013). Within the northwestern Great Basin and Cascade Range, high frequencies of artiodactyl remains were also documented in Terminal Prehistoric components (Carpenter, 2002). This pattern has been tied to high levels of territorial circumscription and social conflict, creating buffer zones where artiodactyls were less subject to predation.

One of the most surprising findings of the Ruby Pipeline Study is the explosion of distant, exotic obsidian sources found in a series of sites dating to the Terminal Prehistoric Period (King, 2016). Moreover, this exotic stone is not restricted to worn-out tools, which is usually the case during earlier intervals, but is found in both the tools and debitage, indicating that larger masses of stone were being moved distances like never before. In fact, debitage conveyance distances are up to 12 times greater than those found in other components and include sources like Mount Hicks, located 340 km to the south. There is a good possibility that these findings mark the introduction of the horse to the northern Great Basin (Hildebrandt et al., 2016). Although chronological resolution to fully confirm this hypothesis is lacking, archival research shows that the Northern Shoshone had horses by A.D. 1690 (260 cal B.P.) and traveled widely to the north and east, and that the first ethnographic accounts from the more southern zones of the Great Basin make reference to horsemen.

Ethnographic Context

The primary purpose of this section is to review regional and local ethnographic information with the goal of enhancing our ability to interpret the archaeological findings from the project sites. As a result, we will focus on information linked to subsistence and settlement and intergroup exchange, as well as the social organizational systems associated with these economic pursuits. Much of what follows is derived from a recent ethnographic study focused on the lands immediately to the north of the current project (Barker, 2016; see also McGuckin, 1996; Bengston, 2003, 2006).

Our project area lies within the original homeland of the Northern Paiute, which were composed of multiple independent groups speaking a common language (fig. 4). At historic contact, people speaking Northern Paiute, which is one of multiple Numic languages, occupied a large region in Oregon, Idaho, and Nevada (Steward, 1939; Fowler and Liljeblad, 1986; Fowler, 1992; Rucks, 2002). It stretched from the John Day River, Oregon in the north; east to the edge of the Snake River Plain, Idaho; south to the Mono Lake Basin, California; and west to the California/Nevada border north of Honey Lake (Fowler, 1992). The boundaries of this area blended into the boundaries of other Numic-speaking groups, including the Western Shoshone to the east, the Owens Valley Paiute to the south, and the Bannock and Northern Shoshone to the north, as well as the Klamath (Penutian stock) to the northwest, and the Washoe (Hokan stock) to the west (Fowler, 1992; Rucks, 2002).

Northern Paiute social organization was quite fluid, with the family being the primary social unit. Multiple, related families mostly occupied a home tract or district, clustering together during winter and dispersing into smaller groups during the warm seasons (Fowler and Liljeblad, 1986). Most families and individuals became identified with these loosely bounded districts, and the districts were typically named after the primary food resource or geographic area that was used (Steward, 1939, 1941). Boundaries of four different districts come together near the project area, probably testifying to the marginal, hinterland nature of the Black Rock Desert (Steward, 1939). The project area falls within the western lands of the Sawawaktödö ("sagebrush mountain dwellers"), who were mostly associated with the Humboldt River near Winnemucca. The other three districts were occupied by the Aga'ipañinadökadö ("fish lake eaters"), who centered on Summit

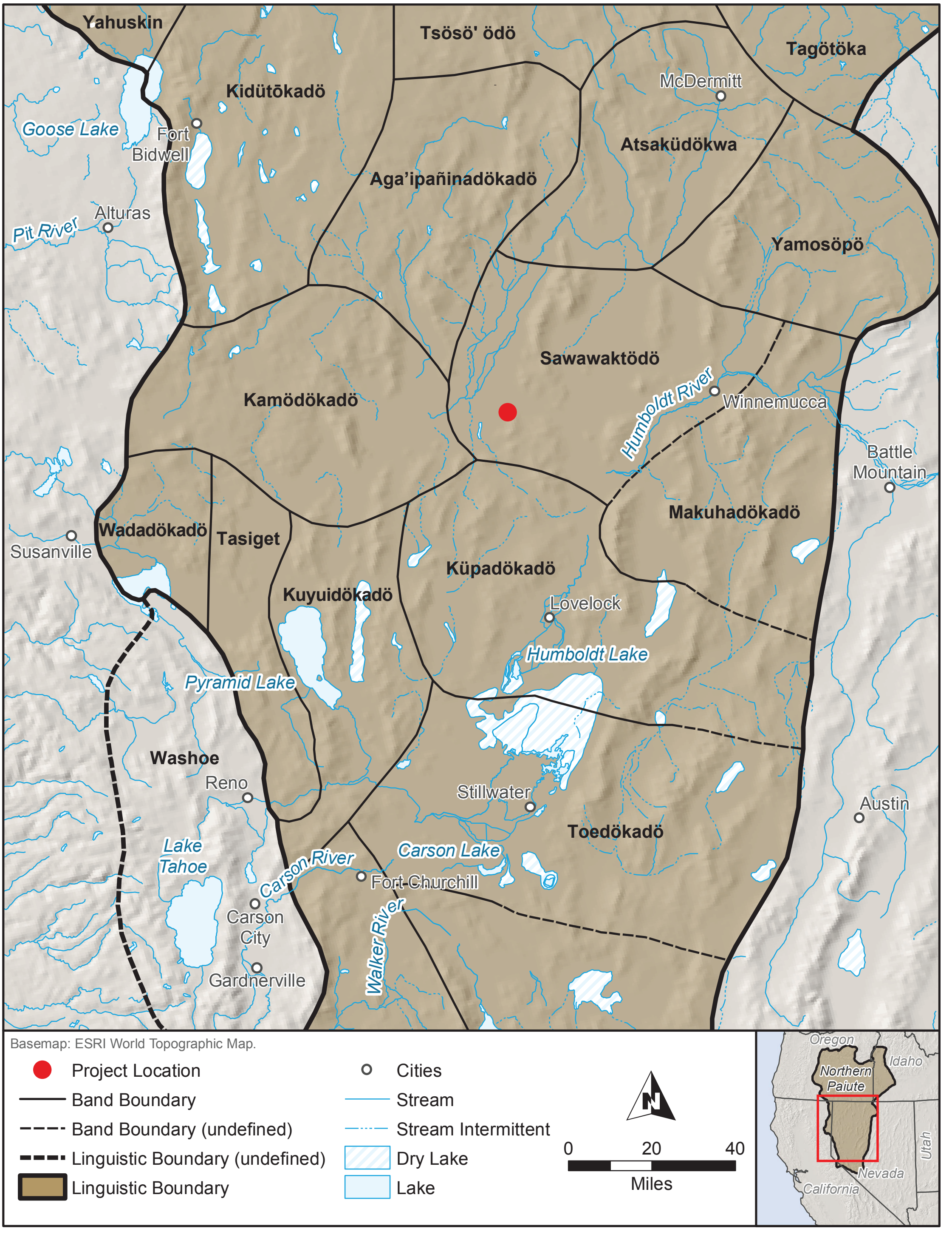


FIGURE 4. Northern Paiute bands (from Steward,1939; Fowler and Liljeblad, 1986).

Lake to the northwest; Kamödökadö ("jack rabbit eaters"), linked to Gerlach at the southwest end of the Black Rock Desert; and the Küpadökadö ("ground squirrel eaters"), associated with the Humboldt River near Lovelock and adjacent Humboldt Sink.

Very little primary ethnographic information is available from the local area, probably due to the early and intense impacts associated with Euro-American settlers traveling along the Humboldt River corridor. The best primary sources available from adjacent areas include Isabel Kelly's (1932) study on the Surprise Valley Paiute, Omar Steward's (1941) general review of Northern Paiute culture, and Catherine Fowler's (1992) work on the Northern Paiute at Stillwater Marsh. The most important secondary source is Fowler and Liljeblad's (1986) article in volume 11 (Great Basin) of the *Handbook of North American Indians* (see also Fowler, 1986; Fowler and Rhode, 2011; Janetski, 2011).

Subsistence and Settlement: Traditional views of Great Basin hunter-gatherers usually emphasize an adaptation focused on pinyon. This makes good sense due to its outstanding nutritional content and storability, and because its distribution is coincident with the core Numa territory in the central Great Basin. But the project area lies well north of the pinyon zone, resulting in subsistence efforts that were more continuous and less seasonal than among people living to the south. Food accumulation and storage sufficient to avoid late winter shortages was more problematic, resulting in a greater emphasis placed on geophyte gathering and animal procurement. To characterize the unique nature of northern Nevada lifeways we begin with a general review of the seasonal round practiced by most groups, giving special focus to strategies relevant to the Humboldt River and areas to the north.

Seasonal Round: Winter encampments along the Humboldt River included the construction of multiple houses (Fowler and Liljeblad, 1986: 443): "The dome-shaped, mat-covered house (*kani*, *nobi*) was the most common winter structure for most of the Nevada Northern Paiute groups. A smoke hole was left in the top and a doorway on one side, usually facing east or away from prevailing winds. A fire for cooking and warming was in the center inside. The size of the house varied according to the size of the family, but 8 ft to 15 ft in diameter seems to have been the standard. Unlike Western Shoshone houses, some Northern Paiute houses were semi-subterranean. Other structures constructed included sweathouses."

With the advent of spring, fishing became an important pursuit among many groups living along the Humboldt River and its tributaries. The most important taxa probably included minnows (Cyprinidae) and suckers (Catostomidae), which favor slower water habitats that characterize much of the streams within the Sawawaktödö district. This was also the time when families moved out of the winter settlements for the early harvest of greens and certain geophyte (or root) crops. Geophytes occurred in valley bottom wetlands, in sandy or rocky sagebrush habitats, and in upland meadows and flats, especially lithosols associated with volcanic landscapes like those found in the High Rock Country to the north (McGuire and Stevens, 2016). They become available in spring when they sprout and their stems and flowers are visible, and can be harvested with digging sticks. Lowland plants were harvested first in early spring and, as temperatures warmed with the arrival of summer, a variety of different species became available at higher elevations away from the valley bottoms.

The most important geophytes were dryland taxa like epos, biscuitroot, bitterroot, sego lily, and balsamroot (Fowler and Rhode, 2011; Rhode, 2016). Temporary camps were established in upland areas with unusually high densities of these plants, particularly epos, and "the roots were rubbed on an open twine tray to divest them of their skins and were…eaten immediately, raw or boiled, or else dried in the sun and stored" (Kelly, 1932: 101).

A variety of hunting activities coincided with the root gathering, especially small game like cottontail rabbits, sage hens and grouse, marmots, and squirrels. All of these animals could be obtained by individual hunters using dead fall traps, snares, bow and arrow, and other means. Deer were also hunted by individuals or small groups at this time (Kelly, 1932; Rhode, 2016).

Diet breadth broadened throughout the summer when a variety of berries and small seeded plant foods became available. Common berries included serviceberries, chokecherries, buffalo berries, and gooseberries, which were eaten raw as well as dried and stored for winter use. The most important seeds included species within the grass, goosefoot, sunflower, and mustard families (Kelly, 1932; Rhode, 2016). They were gathered by hand-stripping or with seed-beaters and trays, winnowed, parched, and ground for use in gruels and cakes (Fowler and Rhode, 2011). Although small seeds are quite labor intensive to collect and process compared to many other resources, they were important in many low-lying areas like the Black Rock Desert where geophytes were less abundant than in upland areas to the north.

Beginning in late summer and fall, and continuing into the winter, deer, antelope, and jackrabbit hunting became primary economic pursuits, especially large communal jackrabbit drives using nets, and larger communal antelope drives using corrals and wing traps. Multiple families participated in the drives, and the meat and furs were equally shared across the group. These communal hunts provided much needed winter food, but they were also important social gatherings for finding husbands and wives, developing trade relationships, and maintaining alliances to gain access to alternative resource areas (Kelly, 1932; Barker, 2016).

Antelope drives were usually held after winter precipitation, as the wet ground tended to tire the animals more quickly. When antelope began to congregate within their wintering grounds, a recognized antelope boss organized a communal hunt, with the herd driven into large corrals made from juniper trees and sagebrush. Many families were required to build the traps, sometimes numbering over 100 people. Once the animals were in the corral, runners kept the herd moving until it was exhausted and as many animals as possible were killed. The meat and hides were shared equally among all hunters, including the boss. Most families dried their meat for later use (Kelly, 1932; see also Ruby, 2016, and Sprengeler, 2017, for a discussion of prehistoric game drive features).

Jackrabbit drives included people who owned large nets measuring 3 × 100 feet or more. One or more net owners (also known as bosses) would organize a hunt involving four or five families. The nets were strung in a straight line across a valley, and men and women would drive jackrabbits to the nets and club them. When a local area was exhausted, the bosses shifted their nets to a new location and continued the hunt. The bosses divided the catch among all families and, as with the antelope drives, people mostly dried the meat for later use (Kelly, 1932; Barker, 2016).

Intergroup Exchange: Most of the commodities exchanged during ethnohistoric times rarely preserve in the archaeological record. Buckskins, moccasins, rabbit skin blankets, woven goods, stone beads, fish, pinyon nuts, and obsidian were widely exchanged with nearby groups, while other, more exotic items from farther west sometimes included acorns, salt, marine shell beads, woven goods, and obsidian (Hughes and Bennyhoff, 1986; Barker, 2016). Resource abundance within a local district could vary from year to year, so multifamily groups could share resource areas with their neighbors where amicable relationships existed. Root-gathering areas to the northwest of the current study area were shared by multiple Northern Paiute groups. This was also the case for joint hunting areas, which were shared with the Klamath/Modoc (Kelly, 1932). The boundary between the Northern Paiute and Western Shoshone just east of Winnemucca was also considered a joint-use area (Fowler and Liljeblad, 1986).

Social Organization: Households based on the biological family were the fundamental unit of social, political, and economic life. They were largely economically, socially, and politically independent. Daily activities of the family were typically directed by a household head who also represented the family in winter villages and at other multifamily activities. The oldest or most experienced household head directed activities when several families gathered together (Steward, 1938).

The winter camp or village consisted of up to 20 households, many related to one another through their parents, married children, and brothers and sisters. Within a named district, like the Sawawaktödö, village families tended to travel together when resource abundance was sufficient to support the entire group. Most village groups had a headman, also selected based on age, experience, and skill. Headman authority, however, was typically limited to specific activities, such as communal hunts, dances, and other ceremonies. A leader's continuing success and longevity could result in an expansion of his or her influence beyond a specific activity or group, including the management of intervillage relationships, but there were no permanently constituted groups above the village. Multivillage gatherings for dances (fandangos) or communal hunts could last several weeks, and were organized and managed by temporary leaders with a reputation for conducting successful events (Steward, 1938; Barker, 2016).

Discussion: Judging from the geographic distribution of the local Northern Paiute districts (see fig. 4), and the fact that all of the four most proximate groups centered their activities away from the study area (i.e., Sawawaktödö, Humboldt River near Winnemucca; Aga'ipañinadökadö, Summit Lake; Kamödökadö, Gerlach; Küpadökadö, Humboldt Sink), it seems likely that the study area was not used as a winter village during ethnohistoric times. Instead, it was probably used on a temporary basis, at the very least as a source of water when traveling through the area. Additional uses seem to have been quite limited, however, as many of the primary subsistence resources like geophytes, large game, and fish were not locally available. The open mosaic of greasewood, seepweed, saltbush, Indian ricegrass, and shadscale desert scrub, did produce a variety of small seeded resources, the most important being seepweed, Indian ricegrass, and tansy mustard. Animal resources, owing to the rather open arid habitat, were largely limited to small game including jack rabbits, cottontails, and a variety of rodents. But as documented by our excavation findings, the draw of small seeds and small game does not appear to have been that strong, as there is little evidence for occupation during the Terminal Prehistoric and ethnohistoric periods.

FIELD AND LABORATORY METHODS

The following is a summary of field and analytical methods employed during treatment of the 20 project sites. All field methods discussed in this chapter were designed and implemented by WCRM in 2012 and 2013. Between 2013 and 2015, WCRM completed a series of analyses on materials collected during fieldwork. These analyses, along with the catalog produced during fieldwork, were evaluated by Far Western in 2016, and additional analyses were implemented where appropriate. The following sections discuss WCRM's field methods, analyses conducted by WCRM, and Far Western's assessment and reanalysis of the collection.

Field Methods

WCRM implemented a variety of field methods at the project sites. These efforts were dependent on site type, research potential, location, and whether or not the site was expected to be directly or indirectly impacted. Extensive subsurface investigations in large exposures were conducted only when substantial subsurface deposits were identified during initial test unit excavations. An overview of the field efforts at the 20 prehistoric and multicomponent sites is presented in table 2, and site-specific field methods for the five primary sites are described in their individual site reports.

Mapping: Hand-held Trimble GPS units were used to map site boundaries, surface artifacts, features, artifact concentrations, trench boundaries, and natural landscapes when appropriate. A total station was set up over primary and secondary site datums during subsurface investigations to plot and record test unit corners and trench boundaries.

Surface Investigations: Prehistoric artifacts located on site surfaces were mapped and assigned a field specimen (FS) number unique to a particular site. Surface botanical, faunal, and noncultural items were assigned unique site analytical field specimen (AFS) numbers, recorded separately from FS numbers. All tools and select samples of debitage were collected from the surface of most sites.

Surface collection grids measuring 10 × 10 m were placed on selected lithic concentrations within specific sites to obtain a more complete record of surface artifact concentrations. Each collected specimen within a surface collection grid was assigned a FS or AFS number unique to that grid, and specimen locations were recorded to the nearest 1 × 1 m southwest corner. The grid number (e.g., 2 for Grid 2) was placed at the beginning of a three-digit series used to describe locations within the grid. For example, a specimen collected within the southwesternmost 1 × 1 m of Surface Collection Grid 2 would be recorded at N200/E200, while a specimen collected within the northeasternmost 1 × 1 m would be recorded at N209/E209.

Collected specimens were cataloged using a Microsoft Access digital database. In subsequent sections, artifacts are referenced by catalog number. Noncollected materials are referred to by their FS/AFS numbers, and surface artifacts on site maps are labeled with FS/AFS numbers.

Subsurface Investigations: Initial subsurface investigations were focused on evaluating the nature and extent of subsurface cultural deposits and determining the potential to address research questions. Three methods of subsurface investigation were employed: (1) mechanical trenching; (2) augering; and (3) controlled excavation of test units. Once the potential for subsurface deposits was sufficiently evaluated, the most promising deposits were subjected to supplementary trenching, augering, and test units. All cultural materials identified during subsurface investigations were collected, along with nonartifact samples as appropriate.

During excavations, depth was occasionally recorded in centimeters below surface, but was primarily recorded in meters above a theoretical subsurface datum located 100 m below the site's primary or secondary surface datums. For example, the depth of an item located 10 cm below the nearest site datum would be recorded as 99.90 m.

Mechanical Trenching. Mechanical trenching was employed to determine whether dunes or other landforms contained subsurface cultural deposits, and when present, the depth and horizontal extent of these deposits. Trenching also aided in geomorphological and geoarchaeological interpretations of the landforms. Trenches were generally 3 ft wide and excavated to a maximum of 4.5 ft below surface. In the event that this depth was not sufficient to fully reveal a cultural deposit, trenches were expanded and stepped back to reach greater depths. In several instances, large areas of upper sterile dune deposits (overburden) were removed and the dune was leveled by dune-stripping. This created a flat surface on which large shelters (22 × 24 × 10 ft) were erected to protect the excavation grids from inclement weather conditions, such as blowing wind/sand, rain, and snow.

Trench spoils were spot-screened (five to 30 gallons per spoils pile) and evaluated for the presence of cultural materials. Spot-screen locations were mapped horizontally and vertically within the trench. All cultural materials recovered from the screened matrix were collected. When features determined to be cultural were

TABLE 2
Fieldwork Summary

State No.	Agency No. (CRNV-)	Age	GPS Mapping	Surface Artifact Collection	Surface Collection Grids	Mechanical Trenches	Augers	Test Units	Cubic Meters Excavated from Test Units
26HU1826	22-3868	Multicomponent	Yes	Yes	-	-	-	-	-
26HU1830	22-3872	Multicomponent	Yes	Yes	2	25	133	171	177.92
26HU1876	22-4102	Multicomponent	Yes	Yes	–	9	10	84	63.19
26HU2472	22-3751	Prehistoric	Yes	–	–	–	–	–	–
26HU2871	22-3775	Multicomponent	Yes	Yes	–	8	–	79	47.17
26HU3118	22-4670	Multicomponent	Yes	Yes	3	19	–	113	98.58
26HU5441	02-9768	Prehistoric	Yes	Yes	–	1	–	1	0.20
26HU5443	02-9770	Multicomponent	Yes	Yes	–	1	–	1	0.41
26HU5446	02-9774	Multicomponent	Yes	Yes	–	1	–	1	0.40
26HU5448	02-9776	Prehistoric	Yes	Yes	–	2	–	3	1.28
26HU5459	02-9787	Multicomponent	Yes	Yes	–	5	–	1	0.74
26HU5479	02-9807	Prehistoric	Yes	Yes	–	–	–	3	1.07
26HU5487	02-9815	Prehistoric	Yes	Yes	1	4	–	6	3.43
26HU5598	02-9909	Multicomponent	Yes	Yes	1	6	–	4	3.16
26HU5621	02-9957	Multicomponent	Yes	Yes	–	3	–	29	25.65
26HU5627	02-9963	Prehistoric	Yes	–	–	–	–	–	–
26HU5628	02-9964	Prehistoric	Yes	–	–	–	–	–	–
26HU5630	02-9966	Multicomponent	Yes	Yes	1	2	–	29	24.26
26HU5635	02-9971	Prehistoric	Yes	Yes	–	3	–	–	–
26PE2464	22-6714	Multicomponent	Yes	Yes	–	–	–	–	–
Total	–	–	–	–	8	89	143	525	447.40

encountered, mechanical excavation either halted entirely and moved to another location, or was moved 3 m back along the same trench to resume trenching.

Augering. Hand-operated augers were employed to quickly identify the presence or absence of subsurface cultural deposits. Extension poles allowed crews to reach a maximum depth of approximately 2 m below modern ground surface, while the auger was excavated in roughly 23 cm intervals (9 inches), with a diameter of approximately 10 cm (4 inches). Retrieved sediment from each successive bucket was placed on a tarp and depth measurements were recorded. The sediment from each bucket was screened individually and artifacts were collected when present. In total, 143 auger holes were excavated at two sites.

Excavation Units. Initial test unit excavation was employed to evaluate the potential for undisturbed cultural deposits of various surface features and artifact concentrations. Stoner et al. (2012) identified specific features for subsurface investigations, although some originally selected for test excavation were determined to be on highly deflated surfaces or otherwise disturbed contexts. In these instances, alternate features were excavated. Test units within or adjacent to surface collection grids were selected based on results of the grid collections. Additional grids, typically measuring 5 × 5 m and composed of 25 individual test units, were established within high-artifact concentrations or on top of large features to produce large excavation exposures. Grids were expanded when appropriate to fully investigate subsurface deposits. Overall, 525 test units were excavated at 14 of the 20 sites presented here, totaling 447.4 m^3 of hand excavation.

Test units were excavated by removing a controlled volume of sediment with a shovel or trowel. Typically, test units measured 1 × 1 m, although other configurations, such as 0.5 × 2.0 m, were employed on occasion. Units were excavated in arbitrary 10 cm levels, unless natural stratigraphic breaks were identified, and each 10 cm level was numbered successively from 1 to *n*. Sediment was screened through 1/8 inch hardware mesh, and excavation was typically terminated after two successive culturally sterile levels.

Vertical control was maintained by using line-levels connected to local datums, or with rotating laser line levels with known depths relative to a site datum. The depth of the surface and each subsequent level was recorded at all four corners of the unit, and the depth and horizontal location of encountered artifacts was recorded when possible. Each tool collected during hand excavation was assigned a FS/AFS number unique to the unit, while bulk artifact types were collected and assigned FS/AFS numbers in lots (debitage, bone, etc.). One-liter soil samples were collected from unit levels or features when deemed appropriate for flotation analysis or radiocarbon dating.

When subsurface features (i.e., hearths and housepits) were identified during excavation, the features were completely exposed horizontally at the depth of the initial identification. In these instances, multiple adjacent units were excavated to a unified depth to fully expose the feature. Once exposed, the feature was mapped and photographed. One-half of the feature fill was then excavated and either screened or collected. After a profile map was drafted, the remaining fill was excavated and collected. Large features, such as housepits, were excavated in quarters instead of halves, resulting in two cross-section profiles. All artifact and nonartifact specimens collected within feature boundaries were designated as associated with that feature, and each artifact or group of artifacts were assigned a FS/AFS number unique to that feature.

Laboratory and Analytical Methods

All collected materials were cataloged by WCRM daily during fieldwork using a Microsoft Access digital database. Cataloging procedures followed a standardized format, with all materials processed in sequential order (by site, unit, or feature, and level from top to bottom). Each tool received an individual catalog number, while fauna, debitage, and so on were assigned a group or lot number. The project materials were cataloged as a continuous collection, without overlapping catalog numbers for each site, such that each catalog number referenced in the following chapters is unique to the entire project. At the conclusion of fieldwork, the collection was returned to the WCRM laboratory in Sparks, Nevada, for processing and analysis. In December 2015, the collection was transferred to the Far Western laboratory in Davis, California, for assessment and reanalysis. During assessment, catalog numbers and provenience data within the catalog were maintained, although the overall structure and format of the catalog was transformed to comply with Far Western standards.

Table 3 lists all prehistoric artifacts collected from each of the 20 sites presented in this volume. Artifacts were separated into broad artifact classes (flaked stone, ground stone, faunal remains, etc.) and then into more specific artifact descriptions within each class (projectile point, debitage, etc.). Analytical attributes were recorded into a Microsoft Access database, specific to each artifact description. Technical studies of artifacts and faunal remains are presented in the original technical report (McGuire et al., 2017), and site-specific results are incorporated into the following sections where appropriate.

Artifact Analyses: *Flaked Stone*. All flaked stone tools were examined by Far Western personnel to confirm or alter WCRM's artifact assignments, and further inspected to determine

TABLE 3
Prehistoric Assemblage Summary

Type	State No. (26HU)																Total
	1826	1830	1876	2871	3118	5441	5443	5446	5448	5459	5479	5487	5598	5621	5630	5635	2464	
Flaked stone																		
Projectile point	–	92	22	56	26	1	–	1	1	8	–	3	5	5	3	3	2	228
Biface	2	379	108	216	219	–	1	–	–	13	–	25	52	39	72	5	11	1142
Drill	–	4	1	–	1	–	–	1	–	–	–	–	–	–	–	1	–	8
Formed flake tool	1	125	9	71	34	–	–	–	2	4	1	9	20	3	17	1	5	302
Flake tool	2	198	56	191	58	1	–	–	1	1	3	18	26	6	64	2	–	627
Cobble tool	–	4	3	–	1	–	–	–	–	–	–	3	1	–	1	–	–	13
Core tool	–	3	–	2	3	–	–	–	–	1	–	1	8	–	3	–	1	22
Core	–	44	7	68	26	–	–	–	–	1	–	8	125	4	4	1	–	288
Tested cobble	–	1	–	–	1	–	–	–	–	–	2	–	–	–	–	–	–	4
Debitage	2	53,027	18,638	50,091	26,096	–	37	–	3	109	5	888	10,631	12,076	7090	343	–	179,036
Ground stone																		
Millingstone	–	26	20	2	10	–	–	–	–	1	1	1	1	7	2	–	–	71
Handstone	–	16	–	1	9	–	–	–	–	–	–	–	2	2	1	1	–	32
Mortar	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Anvil	–	5	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	7
Battered cobble	–	23	–	5	5	–	–	–	–	1	–	1	17	1	–	1	–	54
Misc. ground stone	–	16	6	1	1	–	–	–	1	–	–	4	–	–	1	–	–	30
Miscellaneous prehistoric items																		
Bead, shell	–	10	–	–	30	–	–	–	–	–	1	–	–	–	–	–	–	41
Bead, stone	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1
Bead, bone	–	3	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5
Awl	–	1	3	–	1	–	–	–	–	–	–	–	–	–	–	–	–	5
Modified bone	–	20	1	3	–	–	–	–	–	–	–	–	–	–	–	–	–	24
Modified shell	–	–	–	–	11	–	–	–	–	–	–	–	–	–	–	–	–	11
Modified stone	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Manuport	–	47	12	7	31	–	–	–	–	–	–	5	4	4	5	–	–	115
Fire-affected rock	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Faunal remains																		
Bone	–	13,274	2468	604	1473	–	1	–	3	–	43	4	–	80	24	–	–	17,974
Shell	–	9	–	3	6	–	–	–	–	–	–	–	–	–	–	–	–	18
Total	7	67,329	21,359	51,321	28,045	2	39	2	11	139	56	970	10,892	12,227	7287	358	19	200,063

material type, artifact condition (i.e., whole or fragmentary), maximum measurements of length, width, and thickness, and the presence or absence of residual cortex and evidence of heat treatment. Additional attributes were selected by Far Western according to each specific artifact description. A brief explanation of the artifact types and analytical methods specific to these types is discussed below.

Projectile points are the bifacially flaked stone tips of projectile darts or arrows that retain characteristic basal or hafting elements. Attributes recorded for projectile points included the plan and cross-section shape of the tool, the presence or absence of serration and reworking, and morphological measurements specific to projectile points (e.g., axial length and basal width). Projectile points were classified by type according to these measurements and according to diagnostic features, as described in detail in Chronological Controls. A total of 229 projectile points was analyzed.

Bifaces are tools that exhibit flaking on opposing sides of a continuous margin. Morphological observations noted during analysis of the biface assemblage included plan and cross-section shape of the tool and reduction stage. Reduction stage is presented in subsequent chapters and discussed in site-specific reports, and thus warrants additional discussion. Stage 1 bifaces display rough bifacial edges and thick, sinuous margins, with fewer than 60% of the perimeter edge shaped. Stage 2 bifaces are percussion-shaped specimens with a roughly shaped outline. Stage 3 bifaces are percussion-thinned, well-formed items. Evidence of intermittent pressure flaking and late-thinning flake scars are seen on Stage 4 bifaces, which are further reduced and somewhat symmetrical. Stage 5 bifaces are fragments of extensively pressure-flaked implements and are considered (nondiagnostic) finished tools (e.g., projectile points, knives). A total of 1142 bifaces was analyzed.

Drills are flaked stone tools with one or more ends shaped into a narrow bit used to bore or perforate holes. Blanks used to make drills can range from extensively shaped bifaces to flakes with minimal modifications. The drill base is typically broader than the bit, and sometimes shaped, to facilitate holding or hafting. Technological attributes specifically recorded for the drills include bit cross-section shape, bit length, and bit width. Eight drills were collected during mitigation and analyzed.

Formed flake tools are flakes that have been modified, usually unifacially, to the degree that the original edge shape has been highly altered. These tools typically show steep, intrusive flaking on one or more margins. Technological observations on formed flake tools include flake blank type and number of worked edges. Simple flake tools (hereafter referred to as flake tools) exhibit limited edge modification and/or retouching that may be intentional or may be the unintentional by-product of use. In contrast to formed flake tools, the basic outline of the original flake remains essentially unaltered; these are equivalent to "used" or "utilized" flakes. Cobble tools are similar to flake tools in degree and morphology of edge modification, but they are typically larger, and produced on cobble blanks rather than flakes. Simple flake tools and cobble tools were subjected to the same analysis as formed flake tools. A total of 943 specimens was analyzed according to these attributes, including 302 formed flake tools, 628 flake tools, and 13 cobble tools.

Cores are implements with multiple flake scars in a uniform or multidirectional pattern, reduced for the manufacture of debitage. Core tools additionally display evidence of use on one or more edges, such as grinding, battering, or edge flaking. Attributes recorded for cores and core tools include the pattern of flake removals (multidirectional, unidirectional, etc.) and blank type. A small number of cobbles with minimal flake scars and no further evidence of use or reduction (i.e., tested cobbles) was collected and analyzed. A total of 288 cores was analyzed, along with 22 core tools and four tested cobbles.

Debitage represents the waste remains from flaked stone artifact manufacture. More than

179,000 pieces of debitage were collected during this project. Debitage was cataloged in provenience lots irrespective of material type, but separated and counted by material after cataloging. CCS dominates the debitage assemblage at 80.2%, while obsidian accounts for 18.5% of collected flakes. The remaining debitage collection, at 1.3%, includes minimal quantities of fine-grained volcanic, quartzite, and unidentified material types.

WCRM performed technological analysis on a 5% random sample of debitage from each cataloged bag, totaling 8458 flakes. Unfortunately, this resulted in limited technological information from individual sites and even less from component areas. Furthermore, 4016 of the analyzed flakes could not be assigned to one of WCRM's flake types (i.e., typed as "indeterminate"), such that nearly half of the 5% sample did not yield analytical information. Although Far Western typically samples complete debitage assemblages for technological analysis at targeted excavation units for a comprehensive assessment of reduction activities within component areas, no additional analyses were conducted on debitage.

Far Western grouped WCRM's flake types into broader reduction types (e.g., core reduction) to assess potential patterns of flaked stone reduction strategies in prehistoric components. Reduction types are used in the following debitage discussions within site-specific sections of this volume, and flake types with their corresponding reduction types are presented in table 4.

Ground and Battered Stone. Far Western examined and analyzed all items cataloged by WCRM as ground stone, assigning each to a particular tool type, as defined in the following paragraphs, or as a manuport when manufacture or use wear was absent. Each tool was examined for material type, artifact condition, and maximum measurements of length, width, and thickness. All ground stone tools were analyzed using the same set of attributes, including plan and cross-section shape, the presence or absence of cortex and residue, and evidence of heat treatment, burning, and reworking. The type and degree of manufacture wear was recorded before analyzing use-wear surfaces. The location, cross-section shape, type of wear, degree of wear, and metric size of each use-wear surface was recorded, along with the presence or absence of striations and/or polish on each surface.

Millingstones are tools on which materials were ground or pounded with a handheld implement (i.e., handstone), resulting in at least one modified surface where use took place. When possible, millingstones were assigned to one of three subcategories according to maximum thickness, as a way to indicate portability: thin millingstones (<60 mm), thick millingstones (60–130 mm), and block millingstones (>130 mm). Handstones are handheld implements typically used in conjunction with millingstones to grind material between these two tool types. Grinding creates wear surfaces that are usually highly polished and/or striated along entire faces of the handstone, while other wear patterns such as central pecking and end battering may be present. A total of 71 millingstones and 32 handstones was collected and analyzed.

Mortars are stone implements with a cup-shaped depression, typically used in conjunction with a handheld pestle to grind plant material or other types of resources. These tools can exhibit a high degree of shaping, and variety in both depression size and depth. Like millingstones, the size of the specimen can offer information on portability and types of resources processed. Rim thickness was recorded in addition to the regular ground stone attributes, as these implements are typically bowl shaped. A single mortar fragment was recovered from the project area and analyzed.

Anvils are stone implements on which other stones or materials are placed and struck or crushed with another stone tool, such as a battered cobble. These tools are distinguished by a small, occasionally cup-shaped, wear surface on an otherwise unaltered flat stone. Seven anvils were collected and analyzed from two sites.

Battered cobbles are unshaped cobbles or chunks of stone that display heavy battering on one or more surfaces, resulting from pounding

TABLE 4
Flake Types by Reduction Type

Tool finishing/resharpening flake types
Notching flakes
Pressure flakes
Biface production flake types
Biface-thinning flakes
Core-reduction/flake tool production flake types
Bladelike flakes
Burin spalls
Crested flakes
Prismatic/trapezoidal flakes
Core-reduction flake types
Generic core-reduction flakes
General percussion flake types
Bipolar flakes
Edge trimming flakes
Errailures
Error recovery flakes
Outrepassé flakes
Side struck flakes

or percussive activity against another stone. Battered cobbles can be used in conjunction with anvils as the percussive instrument used to strike material laid upon the anvil, although many other functions are possible for these tools. A total of 54 battered cobbles was analyzed.

Thirty pieces of miscellaneous ground stone were collected and analyzed. These items are stone implements with evidence of use and/or manufacture wear that are too fragmentary to assign to a more specific artifact type.

Modified Bone. Modified bone tools are faunal remains with evidence of purposive shaping or other cultural modifications. When modified bone pieces could be identified to a more specific artifact type (i.e., awls and bone beads), these items were cataloged as such, although analysis procedures were consistent for all modified bone. WCRM recorded attributes for modified bone tools included maximum length, width, and thickness, tool condition, taxonomic identification when possible, and recordation of all modifications on the artifact, including the presence or absence of thermal alteration, shaping, flaking, sharpening, polish, rounding, striations, and perforations. Far Western reviewed and confirmed WCRM's analyses of modified bone. Five awls, five bone beads, and 24 other modified bone items were collected and analyzed.

Shell and Stone Beads. Shell and stone beads were collected from three treated sites. Far Western measured and recorded attributes for shell beads following Bennyhoff and Hughes (1987) and Milliken and Schwitalla (2012) to determine bead types, as described in detail in Chronological Controls. Forty-one shell beads were recovered during data recovery and analyzed. The single stone bead was measured and analyzed according to the same set of attributes as shell beads.

Other Artifacts. A handful of other artifact types make up the remainder of the prehistoric artifact assemblage. Eleven pieces of modified shell are included in the collection. All are highly fragmented and while some could potentially represent fragments of shell beads, the pieces are too incomplete to be typed as such. Two stone artifacts display modifications that do not qualify them as ground stone tools, including one modified stone identified as a game piece. Two fire-affected rocks were collected from the site, and 115 manuports are included in the collection. Manuports are nonlocal items transported into archaeological sites that exhibit no other cultural modification. Basic metric and minimal attribute analyses were recorded for these items.

Faunal Remains: Nearly 18,000 pieces of faunal bone were collected during fieldwork, and all cataloged lots of faunal remains were analyzed to determine taxonomic identification and number of identified specimens (NISP) for each taxonomic group. Theresa Lechner of WCRM identified the mammal and reptile remains, with reference to the Sacramento State University, California, comparative collections. Bone was initially sorted into identifiable and unidentifiable categories, then to taxon and element. Unidentifiable mammal fragments were separated into large (e.g., *Odocoileus hemionus*), medium (from cf. *Lepus* spp. to cf. *Canis latrans*), small (from cf. *Dipodomys* spp. to cf. *Sylvilagus* spp.), and indeterminate size categories. Bone modifications resulting from burning, animal gnawing, weathering, and butchering were noted on each specimen. Table 5 presents all identified species and genera in the mammal and reptile remains.

Shannon Goshen of Great Basin Zooarchaeology Consultants identified the avifaunal remains. As conducted for mammal and reptile remains, bone was separated first into identifiable/unidentifiable categories, and then by most specific taxonomic level and element. Unidentifiable avian remains were size sorted into five categories: very small (e.g., Passeriformes), small (e.g., *Egretta thula*, *Fulica americana*), medium (e.g., Laridae, *Corvus corax*), large (e.g., *Ardea herodias*, *Cathartes aura*), and very large (e.g., *Cygnus columbianus*, *Gymnogyps californianus*). Bone modifications were recorded and NISP values were calculated for each identified taxonomic group within a cataloged lot of faunal remains.

One particular focus of this investigation is on the changing use of large-game versus small-game resources through time (the former including artiodactyls, the latter represented primarily by rabbits), as this relationship has been tied to any number of broader issues surrounding settlement pose, mobility, work organization, and gender. The measure of this relationship is usually derived through various abundance indices, including the artiodactyl index (AI). As applied here, the AI is the ratio of artiodactyl plus rabbit bone divided by the artiodactyl bone. Our samples are large enough that this measure can be applied to both the identified specimens, as well as those to the analogous size classes of unidentified mammalian remains defined above.

Special Studies: *Radiocarbon Dating*. WCRM submitted 43 radiocarbon samples from six sites to Beta Analytic, Inc., for accelerator mass spectrometry (AMS) dating. Assays included four mammal bone collagen samples, one sample of organic sediment, and 38 samples of greasewood, rabbitbrush, sagebrush, shadscale, and unidentified charcoal. The majority of samples were collected directly from features during excavation, although a few were pulled from flotation sample light fractions and other contexts. All samples were corrected for isotopic fractionation by measuring $^{13}C/^{12}C$ ratios, and conventional age results were calibrated to calendar years before present (cal B.P.) using the IntCal13 calibration curve on CALIB Radiocarbon Calibration software, version 7.04 (Reimer et al., 2013). Far Western did not submit additional radiocarbon samples for AMS dating. All results are provided in table 9.

Obsidian Sourcing. WCRM submitted 200 samples to Richard Hughes for X-ray fluorescence spectrometry (XRF) analysis, including four raw obsidian cobbles and 196 artifacts identified as projectile points in the original WCRM catalog. During assessment of the collection, Far Western classified 35 of the sourced projectile

TABLE 5
Mammal and Reptile Species and Genera Identified in the Faunal Remains

Common Name	Taxon
Artiodactyls	
Mule deer	*Odocoileus hemionus*
Domestic cow	*Bos taurus taurus*
Carnivores.	
American badger	*Taxidea taxus*
Coyote	*Canis latrans*
Lagomorphs	
Black-tailed hare	*Lepus californicus*
Cottontail rabbit	*Sylvilagus* spp.
Rodents	
Deer mouse	*Peromyscus* spp.
Little pocket mouse	*Perognathus longimembris*
Western harvest mouse	*Reithrodontomys megalotis*
Bottae's pocket gopher	*Thomomys bottae*
Kangaroo rat	*Dipodomys* spp.
Woodrat	*Neotoma* spp.
Reptiles	
Iguana	*Iguana* spp.
Horned lizard	*Phrynosoma* spp.
Coachwhip/whipsnake	*Masticophis* spp.
Garter snake	*Thamnophis* spp.
King snake	*Lampropeltis* spp.
Night Snake	*Hypsiglena* spp.

points as bifaces or debitage, due to the lack of diagnostic projectile point attributes on these items. Because projectile points were exclusively targeted for geochemical sourcing, many of the sourced tools were collected as surface artifacts (n = 82) or from provenience-poor trench spoils (n = 17), thereby disqualifying them from component areas. The remainder (n = 101) were collected from the excavation units. The sourced obsidian items are not paired with hydration data, as WCRM elected not to submit samples for obsidian hydration for this project.

Flotation and Starch Grain Analyses. WCRM collected one-liter soil samples from select features and stratigraphic contexts during excavation. Sixty-nine samples were submitted to David Rhode of the Desert Research Institute for flotation-processing and light fraction sorting, while the remainder was discarded. Due to the small volume of the samples, only 11 archaeobotanical seeds were identified from all sorted light fraction samples combined. It seems clear that the small size of the soil samples selected for flotation analysis and the minimal seed yield would result in a biased and inaccurate view of subsistence strategies if reported. Thus, these results do not warrant further discussion in subsequent sections. Similarly, there was an attempt by WCRM to identify starch grain residues from several ground stone artifacts, but none were identified.

Optically Stimulated Luminescence. Dune sediment samples were collected from three locations by WCRM for optically stimulated luminescence (OSL) analysis to provide relative stratigraphic ages for dunes associated with cultural material. Polyvinyl chloride (PVC) pipe segments, approximately two inches in diameter by 10 inches long, were hammered into clean, straight-walled dune exposures to collect sediment samples from relatively intact portions of the dune. Foam padding was placed between each sample and PVC end caps to ensure tight packing and prevent movement. The samples were sealed with duct tape and marked to show which side was exposed in the wall. Soil moisture samples were collected adjacent to the extracted OSL sample using a 3 oz. soil tin, which was pounded directly into an adjacent freshly exposed face and then sealed and labeled. Soil moisture samples were analyzed within three days of collection by Sophie Baker at the Desert Research Institute soils laboratory in Reno, Nevada. Four OSL samples were analyzed by James Feathers at the University of Washington's Luminescence Laboratory in Pullman, Washington. Results are presented in the original technical report (McGuire et al., 2017).

Curation: All collected artifacts and nonartifact samples cataloged within the study area collection are curated in perpetuity at the Nevada State Museum, a federally recognized and qualified repository that meets or exceeds the standards of Title 36, Chapter I, Part 79 of the Code of Federal Regulations (36 CFR 79). Unique accession numbers were assigned to each site, allocated as the Smithsonian state number followed by "-12/13."

CHRONOLOGICAL CONTROLS

This section outlines the methods used to determine the age of the project sites, focusing on temporally diagnostic projectile points, shell beads, and radiocarbon dates. The goal of these dating procedures was to isolate sites, or parts thereof, into discrete spatio-temporal components, and place those components into the larger chronological sequence developed for the northern Great Basin.

Projectile Points

A substantial collection of projectile points was assembled during the project, totaling 229 items. Many of these could be assigned to commonly known types, some with well-established time ranges of production, others less so. Type assignments were made using a set of morphological and metrical attributes originally described by Thomas (1981) for use in the central Great Basin, with some additions and modifications to accommodate local types (table 6; Hildebrandt and King, 2002). The type assignments also employed a "dart-arrow index" for notched points, to make the key distinction between those generally larger point types that were made to tip darts versus those made to tip arrows (Hildebrandt and King, 2012; see also Smith et al., 2013; Hockett et al., 2014; Smith et al., 2014). This index is simply the neck width plus thickness, which gives an easily measured proxy for the overall robustness of the hafting area. As discussed by Hildebrandt and King (2012), an index value of 11.8 mm proves effective at distinguishing between still-hafted archaeological darts and arrows, and provides a workable split between similarly shaped point types that differ mostly according to size, and that are commonly interpreted as dart points versus arrow points (e.g., Elko versus Rosegate). Morphological and metrical attributes used to assign projectile points to type are presented in table 7.

All points were scanned on a flatbed color scanner as a part of the type-assignment process. Angular measurements (proximal and distal shoulder angles) were made on-screen on the digital images of the points, using the TPSdig digital measurement program (Rohlf, 2009). Many calls remained tentative because metrical attributes were incomplete or violated the criteria set out in table 7 in a minor way, while still suggesting the overall form of the type. Results of typological assignments are shown in table 6. Metrical attributes and assigned types of individual projectile points are presented in McGuire et al. (2017).

TABLE 6
Projectile Point Totals from the Project Sites

Type	26HU1830	26HU1876	26HU2871	26HU3118	26HU5441	26HU5446	26HU5448	26HU5459	26HU5487	26HU5598	26HU5621	26HU5630	26HU5635	26PE2464	26PE3584	Total
Diagnostic projectile points																
Great Basin Stemmed	3	–	12	3	–	–	–	–	–	–	–	–	1	–	–	19
Northern Side-notched	–	1	–	–	–	–	–	1	–	1	–	–	–	–	1	4
Humboldt	7	–	9	–	–	–	–	3	1	2	–	1	–	–	–	23
Contracting Stem	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Gatecliff	5	–	5	2	–	–	–	–	–	1	1	1	–	1	–	16
Elko	39	2	13	–	1	–	–	2	–	1	2	–	1	–	–	61
Lanceolate	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Rosegate	11	14	5	12	–	1	1	2	1	–	1	–	1	1	–	50
Small Stemmed	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	2
Cottonwood	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Desert Side–notched	2	2	–	1	–	–	–	–	1	–	–	–	–	–	–	6
Subtotal	69	21	44	19	1	1	1	8	3	5	4	2	3	2	1	184
Nondiagnostic projectile points																
Indeterminate dart	2	–	5	–	–	–	–	–	–	–	–	–	–	–	–	7
Indeterminate arrow	2	–	3	5	–	–	–	–	–	–	1	1	–	–	–	12
Indeterminate	19	1	4	2	–	–	–	–	–	–	–	–	–	–	–	26
Subtotal	23	1	12	7	–	–	–	–	–	–	1	1	–	–	–	45
Total	92	22	56	26	1	1	1	8	3	5	5	3	3	2	1	229

Great Basin Stemmed: Great Basin Stemmed–series points are weakly shouldered projectiles with relatively long contracting stems and rounded bases (fig. 5). Stem margins are often ground. This series subsumes an assortment of forms recognized throughout the Great Basin, including Cougar Mountain, Parman, Lind Coulee, and Windust (Layton, 1979; Pendleton, 1979; Tuohy and Layton, 1979; Beck and Jones, 2009). They are classic indicators of the Paleoarchaic Period (12,800–7800 cal b.p.) but, as noted in Cultural Context, there is some limited evidence that they might be coeval or even predate Clovis (Beck and Jones, 2010, 2012; Jenkins et al., 2012; cf., Goebel and Keene, 2014).

Northern Side-notched: Northern Side-notched points are primarily a Plateau and northern Great Basin point type (Leonhardy and Rice, 1970; O'Connell, 1971, 1975; Layton, 1985; Sampson, 1985; Wilde, 1985; Delacorte and Basgall, 2012; Thomas, 2013). They are relatively large and triangular in outline, with notches placed high on the blade (fig. 5). Notches are typically deep and rounded, often resulting in a relatively narrow neck for dart points. The base typically has an arcuate incurving shape. Some specimens lacking this distinctive shape (and often referred to more generically as "Large Side-notched") are included here, however. Although Northern Side-notched points are thought to date primarily to the Post-Mazama interval, there is some evidence that they may persist into the Early Archaic on the Modoc Plateau (Hildebrandt and Mikkelsen, 1994; Mikkelsen and Bryson, 1997; Hildebrandt and King, 2002).

TABLE 7
Metric and Morphological Attributes of Projectile Point Types
MTH = maximum thickness (mm); NOA = notch opening angle.

Type	Proximal Shoulder Angle	Distal Shoulder Angle	Dart-Arrow Index	Other Attributes
Notched/shouldered				
Desert Side-notched	≥145	–	<11.8	Flat to strongly indented/notched base
Rosegate	≥90, <145	<180 (or NOA<80)	<11.8	Typically rounded base
Small Stemmed	<90	>180	<11.8	–
Elko	≥100, <145	<180 (or NOA<80)	≥11.8	–
Gatecliff Split Stem	<100	≥180 (or NOA≥80)	≥11.8	Split stem
Contracting Stem Dart	<100	≥180	≥11.8	–
Northern Side-notched	≥145		≥11.8	Flat to arcuate incurved base, notches high on sides
Great Basin Stemmed	<90	≥200	≥11.8	Often edge-ground
Unnotched				
Cottonwood Triangular	–	–	–	Thickness typically <3.0, slightly incurved or flat base
Humboldt Concave Base	–	–	–	Thickness ≥4.7, parallel or flaring sides, arcuate basal indentation
Lanceolate	–	–	–	Thickness ≥4.7, leaf shaped, may have small basal indentation
Great Basin Concave Base	–	–	–	Thickness ≥4.7, basal width typically ≥20, parallel or flaring sides, basally thinned, often edge-ground
Indeterminate				
Arrow sized	–	–	≥11.8 (or MTH≥4.7)	PSA not measurable
Dart sized	–	–	<11.8 (or MTH<4.7)	PSA not measurable

Humboldt Concave Base: Initially defined by Heizer and Baumhoff (1961), these are unshouldered points with slightly to deeply concave bases and margins that are parallel or contract toward the base (fig. 6). Here, they are distinguished from Cottonwood forms by their larger size, particularly thickness (>4.7 mm thick; Cottonwood forms are typically well under 3 mm). Unfortunately, the temporal significance of these points remains poorly established. Delacorte (1997: 78–80) argues that, in contrast to other dating schemes for the Great Basin (Thomas, 1981; Hall, 1983; Jackson, 1985; Basgall and McGuire, 1988; Delacorte and McGuire, 1993), the series appears to be predominantly an Early Archaic marker. Along the Ruby Pipeline corridor, about 75 km north of the current study area, Humboldt points are common in both Post-Mazama and Early Archaic contexts (Hildebrandt et al., 2016), which is largely consistent with obsidian hydration data generated by Layton (1985) from Last Supper Cave and Hanging Rock Shelter.

Gatecliff Split Stem: As defined by Thomas (1981), Gatecliff Split Stem points are shouldered dart points with parallel-sided stems and notched or concave bases (fig. 7). Radiocarbon dates from Gatecliff Shelter and other central Great Basin

FIGURE 5. Great Basin Stemmed and Northern Side-notched projectile points.

FIGURE 6. Humboldt Concave Base projectile points.

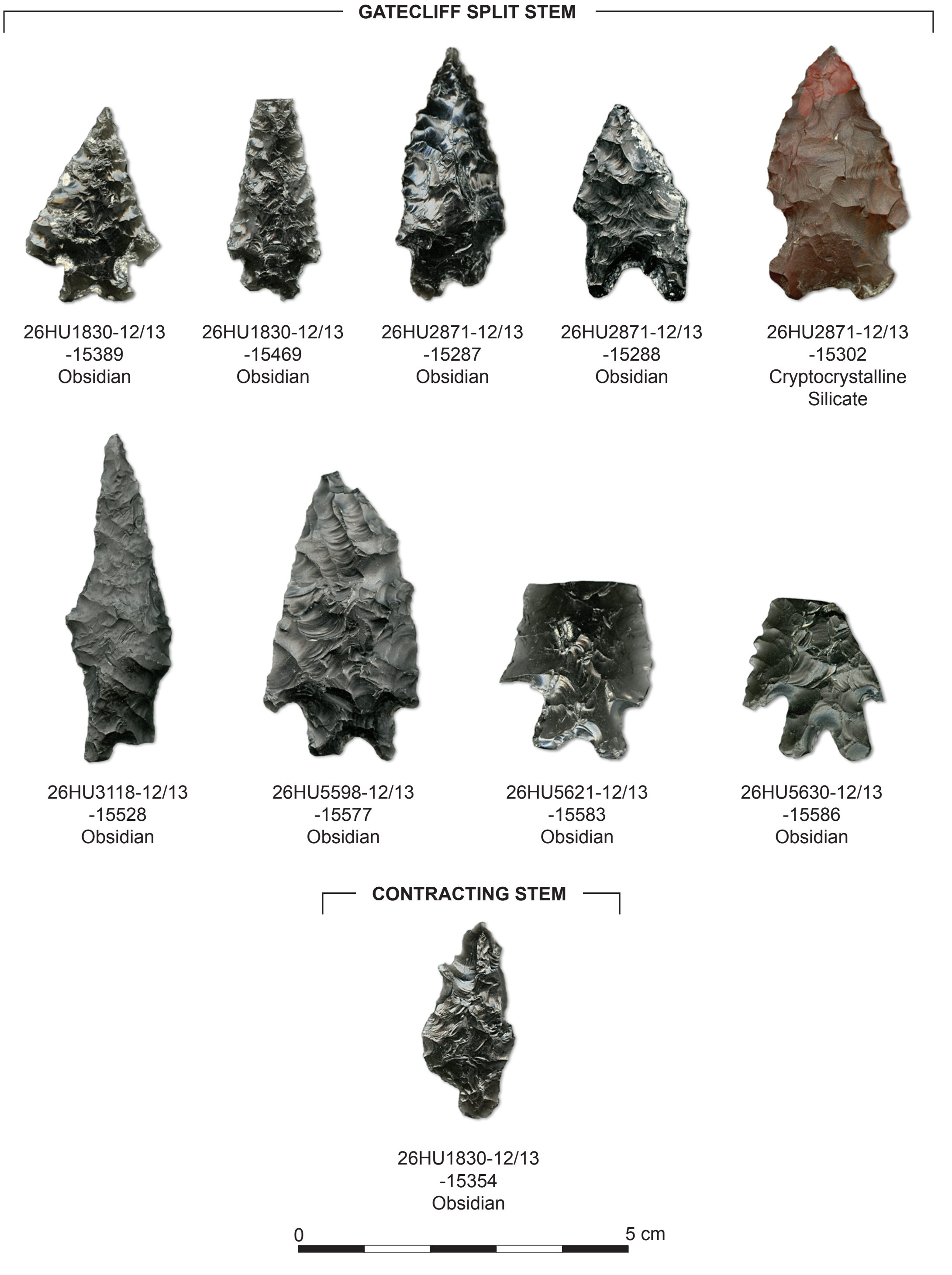


FIGURE 7. Gatecliff Split Stem and Contracting Stem projectile points.

sites have established these as Early Archaic time markers. However, a wide range of contexts in the western and northwestern Great Basin indicates that they may have persisted well into the Middle Archaic, often occurring with Elko points (Bennyhoff and Hughes, 1987: 163; O'Connell and Inoway, 1994; McGuire, 1997: 171–172). Obsidian hydration results from the Ruby Pipeline also suggest a high degree of overlap between Gatecliff and Elko forms (Hildebrandt et al., 2016).

Contracting Stem Dart: The temporal sensitivity of the few specimens assigned to this type is unclear, except for their general classification as dart points (see fig. 7). Thomas' (1981) key identifies a Gatecliff Contracting Stem form coeval with Gatecliff Split Stem points, which would make them an Early Archaic marker. Delacorte (1997) argues that contracting stem forms lack the temporal resolution of Gatecliff Split Stem forms in the western Great Basin. Others have argued that the type may have an Early Archaic affiliation, based on their similarity to the Martis type from the northern Sierra Nevada (Milliken and Hildebrandt, 1997).

Elko Series: Elko series points are corner-notched dart points with a flared base (fig. 8). As defined here, the Elko series includes only the Corner-notched and Eared varieties (cf. Heizer and Baumhoff, 1961b; O'Connell, 1967; Heizer et al., 1968); in this study no attempt was made to differentiate these two variants. Elko points are generally considered Middle Archaic markers in the central and western Great Basin (Bettinger and Taylor, 1974; O'Connell, 1975; Thomas, 1981). However, some have proposed that Elko forms extend back to the Early Archaic (Mikkelsen and Bryson, 1997: 136; see also Hildebrandt and Mikkelsen, 1994; Milliken and Hildebrandt, 1997; Smith et al., 2013).

Lanceolate: These are leaf-shaped bifaces with convex edges and rounded bases, believed to be dart points because of their size and degree of finish (fig. 9). Variously referred to as "Steamboat" along the Sierran Front (Elston and Davis, 1972; Elston et al., 1977; Elston, 1979) and "Gold Hill Leaf" to the north (Cressman, 1933; Davis, 1968, 1970), they have often been considered Middle Archaic markers. However, Hildebrandt and King (2002) saw little temporal sensitivity in the type along the Sierra/Cascade Front. Many may simply be projectile point blanks.

Rose Spring and Eastgate Series ("Rosegate"): The Rose Spring series comprises notched triangular arrow points with expanding stems, the bases of which vary from straight to moderately convex, sometimes with a central notch (Heizer and Baumhoff, 1961; Lanning, 1963). They can generally be described as corner notched, though many specimens are notched more or less vertically from the base, forming long barbs (fig. 9). No attempt was made in this study to distinguish the few longer-barbed specimens that would have been attributable to the contemporaneous Eastgate type (Bettinger, 1989; Heizer and Baumhoff, 1961b), so the inclusive term "Rosegate" is used.

This type is largely a Late Archaic time marker. However, Hildebrandt and King (2002) argue that these points (and hence bow-and-arrow technology) may have been introduced to the western Great Basin somewhat earlier than previously believed, perhaps as early as 1900 b.p. This proposal is supported by a direct date of 1900 cal b.p. on a bag with two probable Rose Spring points from Desiccation Cave, located less than 50 kilometers to the southwest (Smith et al., 2013).

Small Stemmed: The Small Stemmed type (see Alkali Stemmed in O'Connell, 1971) was introduced during previous work along the Sierra-Cascade Front (Delacorte, 1997: 92–94), in part as a means to sort out some of the difficulties in classifying arrow points in the Modoc Plateau region (Hughes, 1986: 95). Small Stemmed points are arrow sized, with parallel-sided to slightly contracting stems (fig. 10). They are distinguished from Rosegate points by their generally lighter weight, broader notch-opening angles, and more parallel stem morphology. Small Stemmed points lack the characteristic hanging barbs of Gunther series points. Based on hydration data, as well as contextual evidence from Surprise Valley (O'Connell, 1971, 1975),

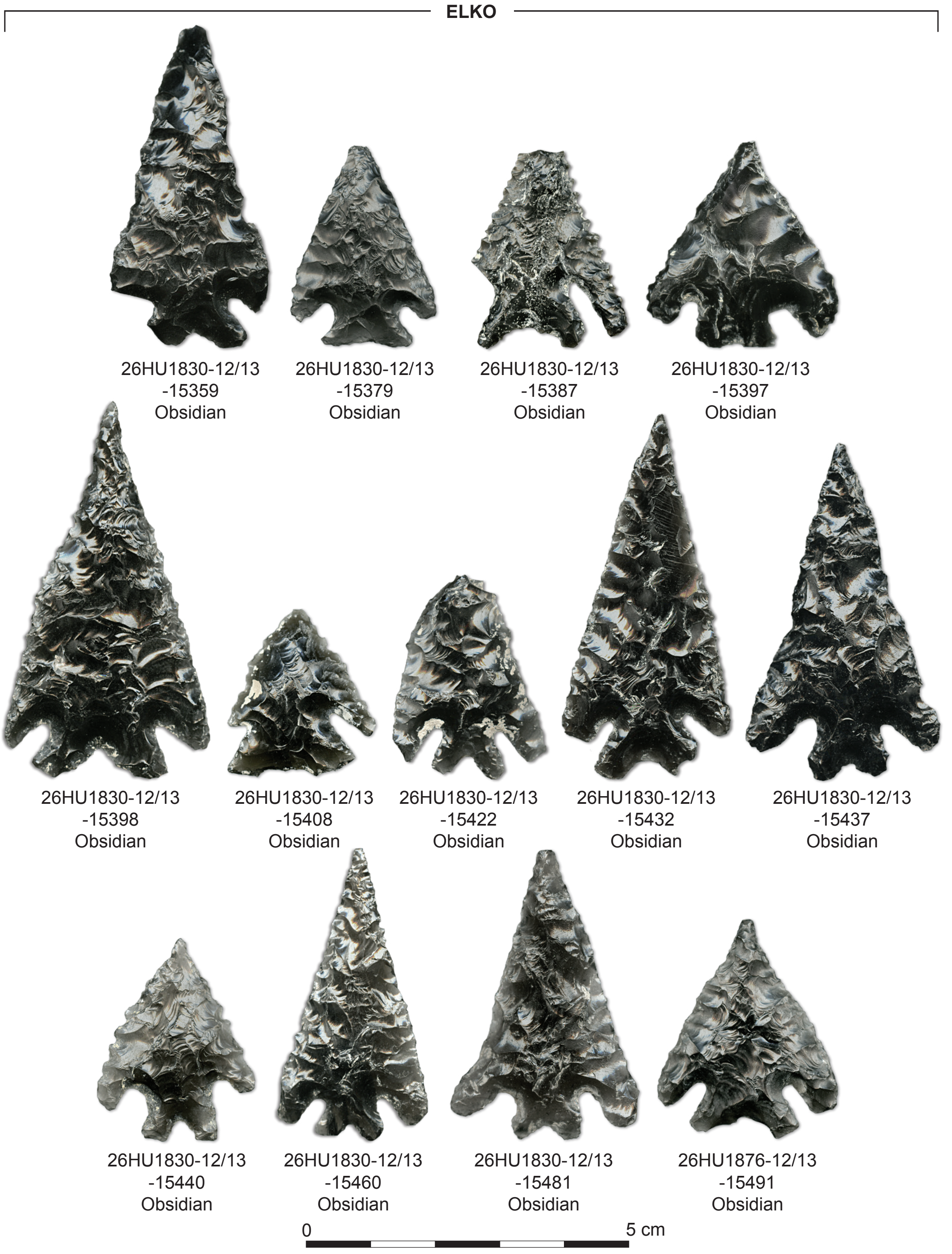


FIGURE 8. Elko projectile points.

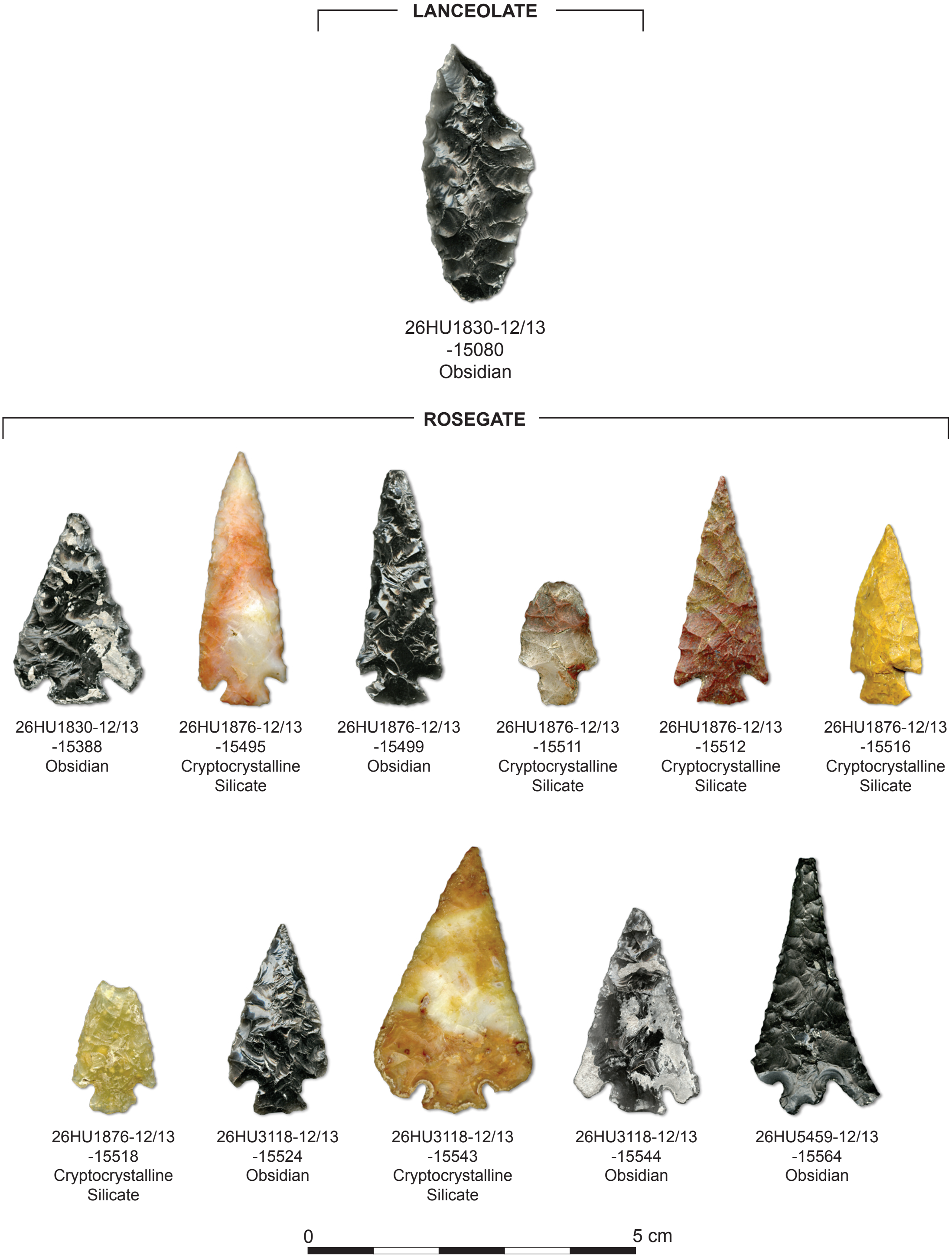


FIGURE 9. Lanceolate and Rosegate projectile points.

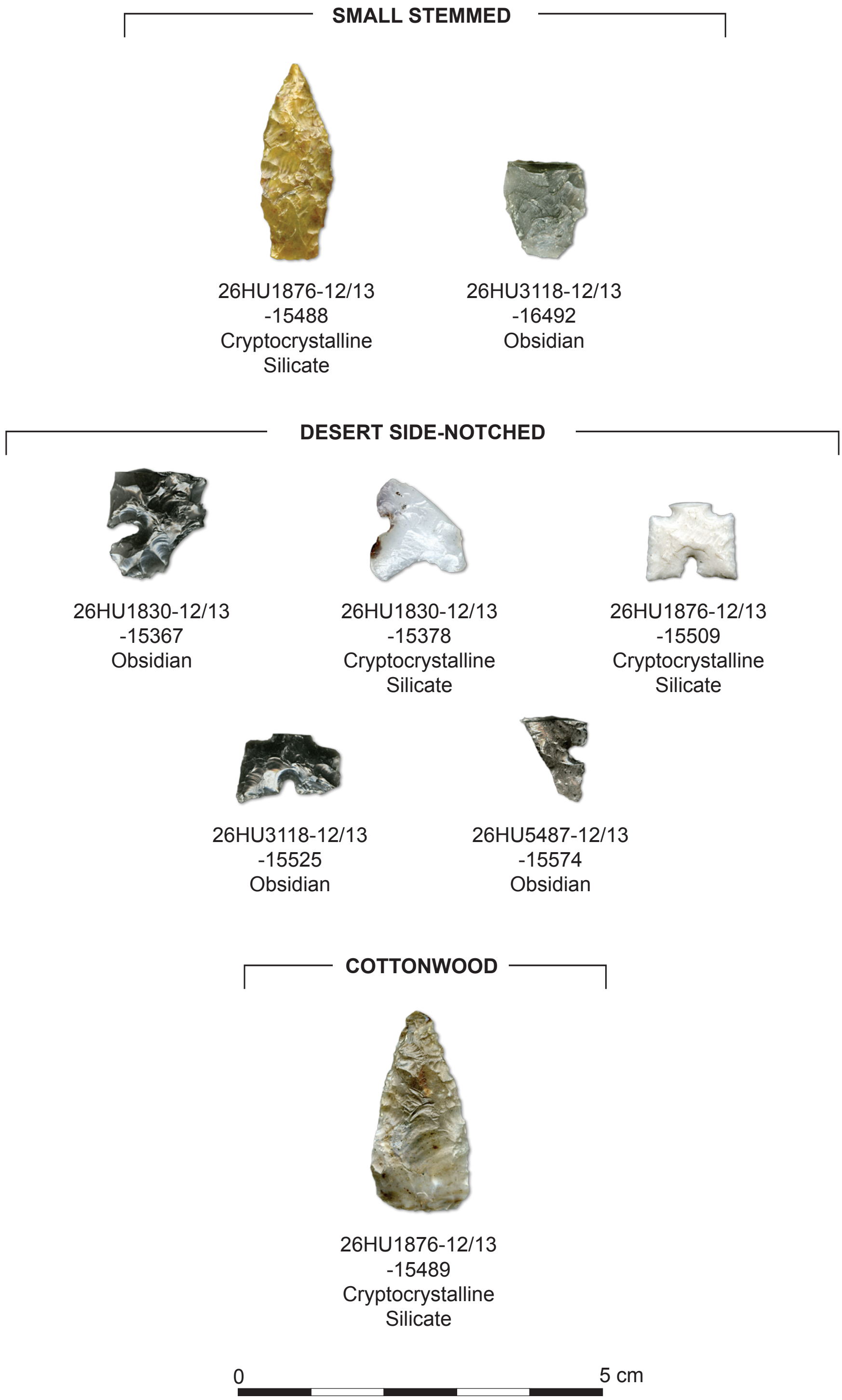


FIGURE 10. Small Stemmed, Desert Side-notched, and Cottonwood projectile points.

Delacorte (1997: 94–95) concludes that Small Stemmed points are temporally distinct from the Gunther series, representing a Late Archaic to Terminal Prehistoric occupation possibly linked to pre-Numic populations.

Desert Side-notched: Originally described by Baumhoff and Byrne (1959), Desert Side-notched points are small triangular arrow points with notches placed high on the sides; most are comparatively thin and long in relation to width (see fig. 10). Many display a deep indentation or notch in the base. They are well-established markers of the Terminal Prehistoric Period (post-600 cal B.P.) in the southwestern Great Basin and may be ethnic markers for Numic populations (Delacorte, 2008). Because the Northern Paiute and Western Shoshone appear to have colonized northern Nevada relatively late in time (i.e., significantly after 600 cal B.P.), it is possible that this point type arrived in the project area only a few hundred years ago (Hildebrandt et al., 2016).

Cottonwood Triangular: This point form is not well represented within the project area. These are small, unnotched triangular points (see fig. 10) considered to be Terminal Prehistoric markers in the Great Basin (Bettinger and Taylor, 1974; Thomas, 1981). They tend to occur with Desert Side-notched points and the two are often combined into a single Desert Series. Cottonwoods could also be indicators of Numic populations in northern Nevada.

Other Types (Dart Sized, Arrow Sized, Indeterminate): Points in the generic dart-sized category include fragmentary, typologically ambiguous, or morphologically unique specimens with thicknesses or dart-arrow index values identifying them as dart points. As such, all were presumably used to tip atlatl darts, dating them to the Middle Archaic or earlier.

As their name implies, arrow-sized points are distinguished from dart points in that they have dart/arrow indices of <11.8 and thus were presumably used to tip arrows. As with the dart points, nearly all of the arrow-sized specimens are incomplete, but given that they postdate the introduction of the bow, they are assumed to be Late Archaic or Terminal Prehistoric in age.

Points categorized as indeterminate are generally fragmentary specimens identifiable as points by the presence of a notch or other telltale hafting element, but not sufficiently complete or distinctive to be assigned to a particular type or even to the generic dart/arrow point categories. Thus they lack temporal utility, although they do serve as a functional indicator of hunting.

Shell Beads

Forty-one shell beads were found at the project sites, including 40 made from *Olivella* shell and one from *Dentalium* (table 8). The beads come from only three sites (26HU1830, 26HU3118, and 26HU5479), and were classified and dated following Bennyhoff and Hughes (1987) and Groza et al. (2011). Only 11 of the *Olivella* specimens could be assigned to a definitive type (fig. 11), as the collection is highly fragmented and, in 17 cases from 26HU3118, significantly burned.

One of the two spire-lopped beads (Medium Spire-Lopped; A1b) has little chronological value as this type was used from 5500 cal B.P. to historic contact. The other (Small Spire-Lopped; A1a) saw two major periods of use, one during the Early and Middle Archaic (5500–2775 cal B.P.) and the other during the Terminal Prehistoric (685–180 cal B.P.). The Split Drilled (C2) beads also have two intervals of use, one during the Middle Archaic (2150–1530 cal B.P.) and the other during the Late Archaic (930–685 cal B.P.). This is also the case for Split End-Perforated (C4) beads. The Late Archaic Period is also represented by the Shelved Punched (D1a) and Tiny Saucer (G1), both dating to between 930 and 685 cal B.P.

Some of the fragmentary beads look to be from the C-series (Split). Others could only be classified as C-series or E-series (Lipped) beads. The latter date to the Terminal Prehistoric between about 440 and 180 cal B.P. Finally, a significant number (n = 16) of bead fragments could not be classified at all, while an additional

TABLE 8
Shell Beads and Modified Shell Totals from the Project Sites

Bead Type	cal B.P. Age Ranges [a]	26HU1830	26HU3118	26HU5479	Total
Shell bead					
Olivella					
A1a-Small spire-lopped	5500–2775; 685–180	–	1	–	1
A1b-Medium spire-lopped	5500–contact	1	–	–	1
C2-Split drilled	2150–1530; 930–685	4	2	–	6
C4-Split end-perforated	2150–1530; 930–685	–	1	–	1
D1a-Shelved punched	930–685	–	–	1	1
G1-Tiny saucer	930–685	–	1	–	1
Possible C – split	2150–1530	–	4	–	4
Possible C or E – split or lipped	2150–1530; 440–180	1	8	–	9
Indeterminate	–	4	12	–	16
Dentalium	–	–	1	–	1
Subtotal		10	30	1	41
Modified shell					
Olivella	–	–	9	–	9
Indeterminate	–	–	2	–	2
Subtotal		–	11	–	11
Total		10	41	1	52

[a] Age ranges based on Scheme D in Groza et al. (2011).

11 fragments did not retain enough attributes to be considered anything other than modified shell, although they probably represent beads given that most of them are *Olivella*.

Glass, Stone, and Bone Beads

One glass, one stone, and five bone beads were recovered from the project sites (fig. 12). The single glass bead is a large, leaf-green specimen with a simple, undecorated body. Although this bead type is not precisely dated, it was probably first introduced to the northern Great Basin in the 1820s (Karklins, 2012).

The stone bead is a perforated disk made from malachite. The age of this artifact is unknown. All of the bone beads are made from the long bones of small mammals like jackrabbits and cottontails. They are manufactured by first being scored and then snapped, creating beads that can be relatively short (not much longer than wide) or relatively long tubular items. Additional modifications include polish and striations on their ends and lateral surfaces; some have also been burned. They are usually found in Late Archaic and Terminal Prehistoric components in the western Great Basin but are sometimes found in earlier contexts as well (Thomas, 1983; McGuire et al., 2004, 2008).

Radiocarbon

Forty-three radiocarbon dates were obtained from the project sites. Most came from charred plant remains (n = 39), but four were derived from bone (table 9). The samples were taken from a variety of feature contexts (e.g., hearths, living surfaces) or more generalized midden deposits. They also include one assay from a noncultural sediment sample from a buried

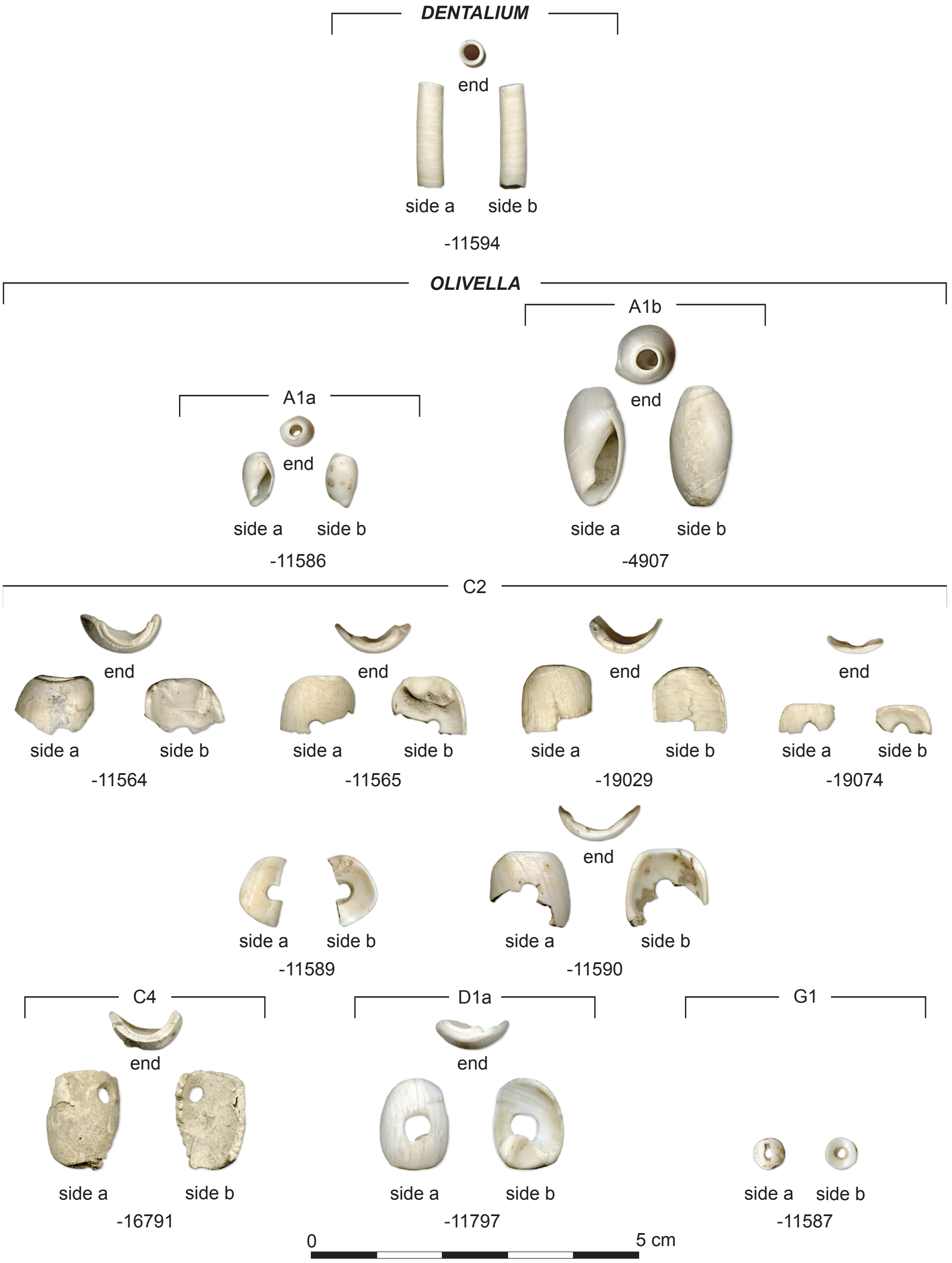


FIGURE 11. Shell beads from the project sites.

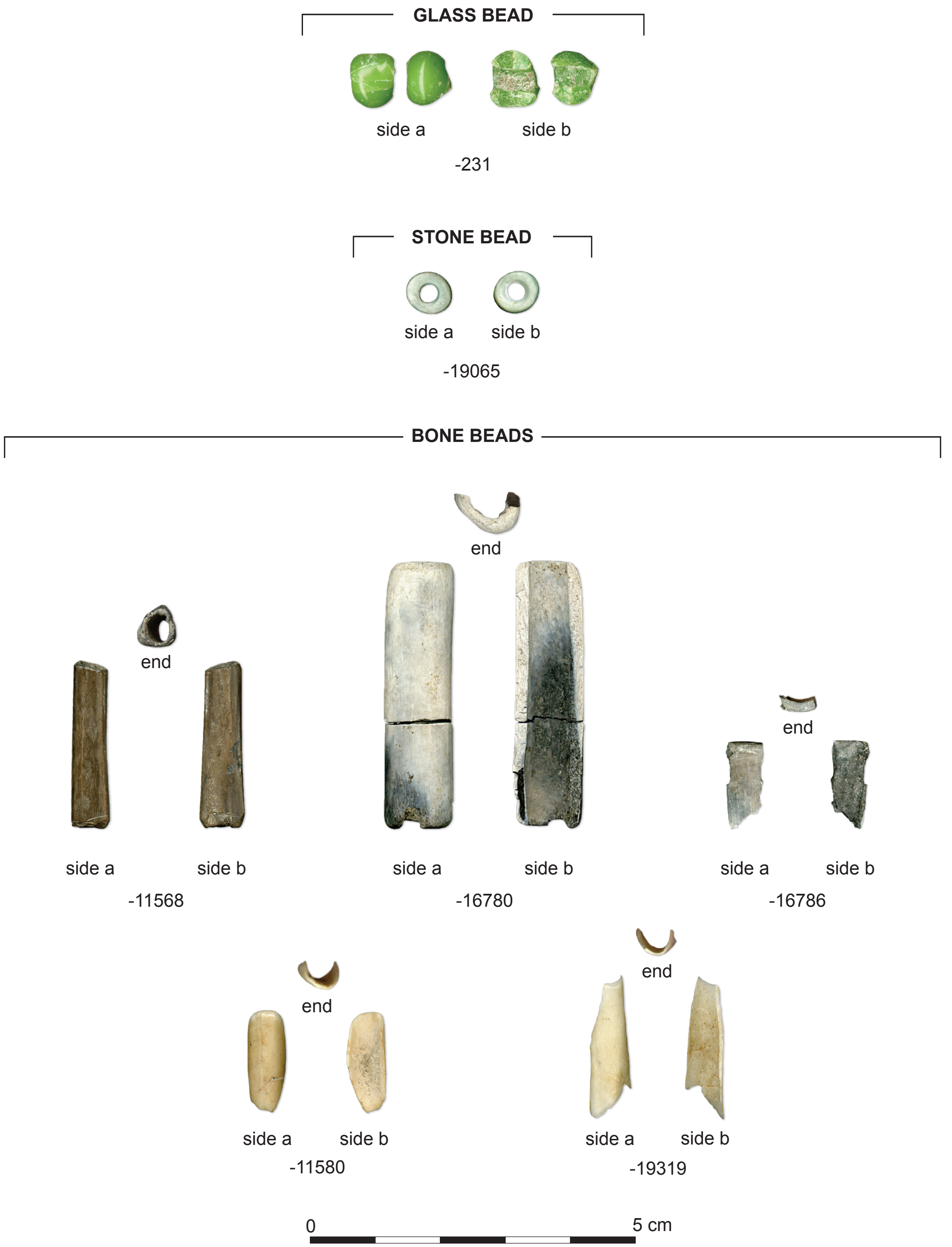


FIGURE 12. Glass, stone, and bone beads from the project sites.

TABLE 9
Radiocarbon Dates from the Project Sites
Calibrated using Calib7.04IntCal13 (Reimer et al., 2013).

Cat No.	Locus	Provenience	Feature	Level	Stratum	Lab. no. (Beta-)	Sample Material	^{14}C Age	Median Probability (cal B.P.)	Calibration (2σ)
26HU1830										
18004	G	TU N207/E201	2-2	5	–	387621	Mammal bone	2840 ± 30	2945	2866–3056
20061	–	Feature 17	17	–	–	386898	Rabbitbrush charcoal	1230 ± 30	1165	1068–1261
20062	G	Feature 2-3	2-3	–	–	386897	Greasewood charcoal	2930 ± 30	3081	2976–3168
20063	–	Feature 4-3.1	4-3.1	–	–	386899	Greasewood charcoal	1410 ± 30	1317	1285–1359
20064	–	Feature 4-4	4-4	–	–	386900	Greasewood charcoal	1330 ± 30	1273	1184–1301
20065	–	Feature 4-5	4-5	–	–	386901	Greasewood charcoal	1360 ± 30	1290	1188–1334
20066	–	Feature 4-6	4-6	–	–	386902	Greasewood charcoal	1450 ± 30	1340	1299–1389
20067	G	Feature 9-1	9-1	3	–	357808	Greasewood charcoal	2860 ± 30	2976	2879–3066
20068	G	Feature 9-1	9-1	3	–	357809	Greasewood charcoal	2880 ± 30	3006	2888–3079
26HU1876										
20069	–	Feature 12.1	12.1	–	–	386884	Greasewood charcoal	1060 ± 30	964	927–1052
20070	–	Feature 28	28	2	–	386885	Rabbitbrush charcoal	970 ± 30	860	796–933
20071	–	Feature 29	29	–	–	343316	Charcoal	1020 ± 30	941	829–981
20072	–	Feature 30	30	–	–	386886	Greasewood charcoal	960 ± 30	856	796–929
20073	–	Feature 30.1	30.1	–	–	343317	Charcoal	970 ± 30	860	796–933
20074	–	Feature 31	31	–	–	386887	Greasewood charcoal	990 ± 30	913	798–961
20075	–	Feature 31.1	31.1	–	–	386888	Greasewood charcoal	1080 ± 30	985	932–1059
20076	–	TU N101/E104	12	8	–	339422	Greasewood charcoal	980 ± 30	876	796–956
26HU2871										
19956	C	TU N100/E102	–	4	IIIb	350355	Mammal bone	6970 ± 30	7803	7706–7922
19968	C	Feature 7	7	–	II	386881	Rabbitbrush charcoal	1330 ± 30	1273	1184–1301
19971	C	Feature 10	10	–	II	383160	Charcoal	880 ± 30	788	729–908
20077	C	Feature 1	1	–	I	335343	Greasewood charcoal	770 ± 30	697	669–733

TABLE 9 (*Continued*)

Cat No.	Locus	Provenience	Feature	Level	Stratum	Lab. no. (Beta-)	Sample Material	^{14}C Age	Median Probability (cal B.P.)	Calibration (2σ)
20078	C	Feature 13	13	–	II	339421	Sagebrush charcoal	1570 ± 30	1468	1395–1533
20079	C	Feature 14	14	–	II	383161	Charcoal	1540 ± 30	1451	1365–1524
20080	C	Feature 19	19	–	II	386889	Sagebrush charcoal	1080 ± 30	985	932–1056
20081	C	Feature 21	21	–	IIIa2	342265	Charcoal	3360 ± 30	3604	3555–3691
20082	C	Feature 34	34	–	IIIa1	386891	Shadscale charcoal	1390 ± 30	1305	1278–1346
20083	C	Feature 38	38	–	Lower III	345541	Charcoal	1420 ± 30	1323	1290–1368
20084	C	Feature 41	41	–	II	386892	Greasewood charcoal	890 ± 30	810	733–909
20085	–	TU 5	30	1	II	386890	Greasewood charcoal	890 ± 30	810	733–909
20086	C	TU N104/E111	–	7	IIIa2	343438	Charcoal	3990 ± 30	4476	4415–4523
20087	C	TU N104/E111	–	9	IIIa2	343439	Charcoal	3010 ± 30	3200	3135–3334
20088	C	TU N104/E112	–	8	IIIa3	343314	Charcoal	3400 ± 30	3645	3572–3714
20089	C	TU N104/E115	–	15	IIIb	342266	Charcoal	3250 ± 30	3474	3399–3561
20090	C	TU N105/E115	–	6	IIIa1	343315	Charcoal	1270 ± 30	1225	1147–1287
20091	C	TU N106/E114	–	15	IIIb	392068	Sediment	10210 ± 40	11916	11760–12086
20092	C	TU N108/E115	–	4	IIIa1	350357	Mammal bone	1930 ± 30	1879	1820–1946
26HU3118										
18513	A	TU N108/E106	–	3	–	387620	Mammal bone	1170 ± 30	1101	986–1179
20093	M	Feature 28.1	28.1	–	–	386894	Greasewood charcoal	1260 ± 30	1218	1123–1281
20094	M	Feature 32.1	32.1	–	–	386895	Sagebrush charcoal	1270 ± 30	1225	1147–1287
20095	C	Feature 4-1	4-1	–	–	386893	Greasewood charcoal	1530 ± 30	1420	1352–1522
20096	–	TU 11	33	1	–	386896	Greasewood charcoal	1480 ± 30	1364	1306–1411
26HU5479										
20097	–	TU 1	1	3	–	378748	Rabbitbrush charcoal	940 ± 30	853	792–924
26HU5621										
20098	A	Feature 2-1	2-1	–	–	378749	Greasewood charcoal	1380 ± 30	1300	1271–1342

Pleistocene soil. The median probability of the calibrated intercept (or median of multiple intercepts) is the primary data point used in all components of this study.

Building Spatio-temporal Components

Where possible, we used diagnostic artifacts, radiocarbon dates, and stratigraphic relationships to place sites, or parts of sites, into discrete spatio-temporal components. These components can range from single features or flaked stone reduction events, to large occupation areas; but each is identifiable to a specific period, and each represents a discrete episode of prehistoric land use. Some of the larger sites may contain multiple components, representing significant spans of time. Sites or portions of sites that lack temporal data, or have mixtures of material from multiple time periods that cannot be separated from one another, are given a noncomponent designation.

Eleven component areas are recognized, including one dating to the Early Archaic, three to the Middle Archaic, one Middle/Late Archaic mix that we think may have some analytical utility, and six corresponding to the Late Archaic Period. It is important to note that five of the Late Archaic component could be divided into two finer-grained intervals based on a bimodal distribution of radiocarbon dates: Late Archaic A (1340–1165 cal B.P.) and Late Archaic B (950–850 cal B.P.). Table 10 presents the counts of identified components by time period and site.

26HU1830 SITE REPORT

Site 26HU1830 is one of the larger and more complex of the project sites. It was originally recorded in 1987 by Archaeological Research Services (Burke, 1987), and revisited as part of the inventory for the current project (Harmon et al., 2011). The site is a sprawling (approximately 350 × 400 m) multicomponent manifestation with more than a half dozen elevated dune hummock areas that are part of the Sulphur Springs dune field (fig. 13). It is bounded on the east by the disturbed remnants of the Sulphur Springs mound, which no doubt attracted prehistoric populations to this location. Vegetation is dominated by greasewood, shadscale, ricegrass, and inland saltgrass typical of the playa margin.

A complete range of flaked stone (projectile points, bifaces, formed flake tools, cores, and debitage) and ground stone artifacts (handstones, millingstones, pestles) have been observed on the surface of the site. Much of this material is found in discrete concentrations or loci. In addition to artifacts, a number of fire-affected rock features were also identified, almost all situated on dune formations. Excavations conducted as part of the current effort have revealed several zones of complex subsurface cultural deposits. The site also contains a limited historic-era component consisting of surface refuse.

A total of 13 discrete prehistoric artifact loci (Loci A–M; fig. 14) has been identified at the site. These were all delineated on the basis of higher densities of flaked stone tools and debitage. Fourteen features were observed on the surface of the site (fig. 14; table 12). Most appear to be hearths or processing features containing fire-affected rock and/or charcoal staining; two are historic-era mining claims. Both artifact concentrations and surface features were the primary indicators that informed the subsequent subsurface hand and backhoe excavations.

Field Methods

The field strategy at 26HU1830 employed a staged approach that included initial surface reconnaissance coupled with site and feature mapping, surface collection, auger tests, backhoe trench excavations, test unit excavation, and block exposure excavations. Notwithstanding the relatively large number of surface artifact loci and features documented during initial site reconnaissance, the ultimate direction of the field program was informed primarily by the backhoe trenching effort, which documented a number of subsurface features and zones of cultural deposits (midden). These hot spots were initially sampled using a

TABLE 10
Distribution of Single-component Areas across the Project Sites

Sites	Early Archaic	Middle Archaic	Middle/Late Archaic Mix	Late Archaic A	Late Archaic B	Generic Late	Noncomponent	Total
26HU1825	–	–	–	–	–	–	X	1
26HU1826	–	–	–	–	–	–	X	1
26HU1830	–	X	–	X	–	–	X	3
26HU1876	–	–	–	–	X	–	X	2
26HU2871	X	X	X	–	–	X	X	5
26HU3118	–	–	–	X	–	–	X	2
26HU3311	–	–	–	–	–	–	X	1
26HU5441	–	X	–	–	–	–	–	1
26HU5443	–	–	–	–	–	–	X	1
26HU5446	–	–	–	–	–	–	X	1
26HU5448	–	–	–	–	–	–	X	1
26HU5459	–	–	–	–	–	–	X	1
26HU5479	–	–	–	–	X	–	–	1
26HU5487	–	–	–	–	–	–	X	1
26HU5598	–	–	–	–	–	–	X	1
26HU5616	–	–	–	–	–	–	X	1
26HU5621	–	–	–	X	–	–	X	2
26HU5630	–	–	–	–	–	–	X	1
26HU5635	–	–	–	–	–	–	X	1
26HU6505	–	–	–	–	–	–	X	1
26PE2464	–	–	–	–	–	–	X	1
26PE2653	–	–	–	–	–	–	X	1
26PE3584	–	–	–	–	–	–	X	1
Total	1	3	1	3	2	1	21	32

series of small test units either fronting or adjacent to the exposed backhoe trench. Based on these results, certain areas were selected for large-scale block exposures using a series of contiguous 1 × 1 m control units.

It is the excavation of these block exposures that constitutes the vast majority of the work effort at 26HU1830. There are three primary block exposures at the site: Grid 2, located within and adjacent to Locus G; Grid 3, situated north of Locus L; and Grid 4, positioned near Locus C (fig. 14: Detail Maps 1–3). As we document below, Grid 2 is a Middle Archaic component and is further subdivided into north, west, and east zones; about 60 m^3 of excavations were conducted in this area (table 11). Grid 3 exhibits a lower Middle Archaic component and stratigraphically superior Late Archaic deposits; the latter includes 19.1 m3 of excavated matrix, the former 20.75 m^3. Grid 4 is a homogeneous Late Archaic deposit from which over 65 m^3 were excavated.

There are a number of contexts that were excavated that are not associated with these major block exposures and that cannot be attributed to a specific time period. These are assigned to a noncomponent category. As seen on table 11, the deposits excavated from these noncom-

FIGURE 13. 26HU1830 site overview and Trench 16.

ponent contexts comprise less than 8% of the total 184.5 m^3 excavated at the site.

Site Structure and Chronology

Site 26HU1830 is structurally complex, manifesting a series of 12 surface loci and 15 surface features, as well as at three major zones of stratified subsurface deposits. Each of these, as well as associated temporal trends is reviewed below.

Surface Artifact Loci: The surface of 26HU1830 shows varying densities of lithic debris, tools, exhibits rock features, and fire-affected rock. Detailed surface reconnaissance and collection have resulted in the identification of 13 artifact loci lettered A through M on figure 14. These range from simple debitage concentrations to more complex artifact scatters that include flaked and ground stone tools. Rock cooking features, as well as more diffuse scatters of fire-affected rock, were also documented in several of the loci. A brief review of each locus is presented below.

Locus A. This is a very small (3.0 × 4.0 m) debitage concentration located on a dune surface in the western portion of the site. The locus consists mostly of obsidian flakes, with some CCS flakes, and a few pieces of fire-affected rock.

Locus B. This is a moderately sized (12 × 19 m) lithic concentration also located on a dune surface in the western portion of the site. Several bifaces were noted within the locus, though most of the material is CCS debitage.

Locus C. This concentration is located on a dune-playa margin in the western portion of the site. It measures approximately 15 × 11 m and

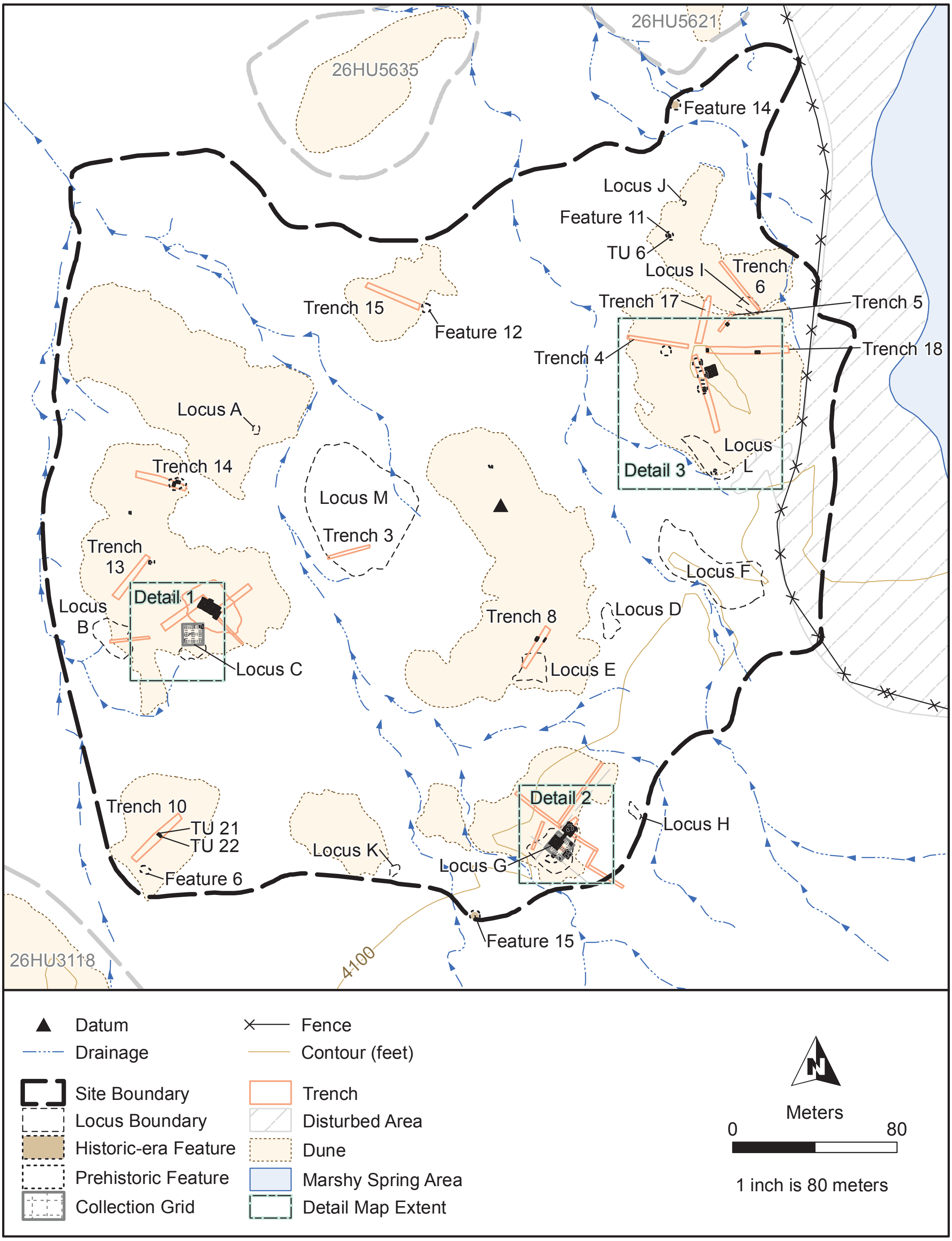


FIGURE 14. 26HU1830 sketch map.

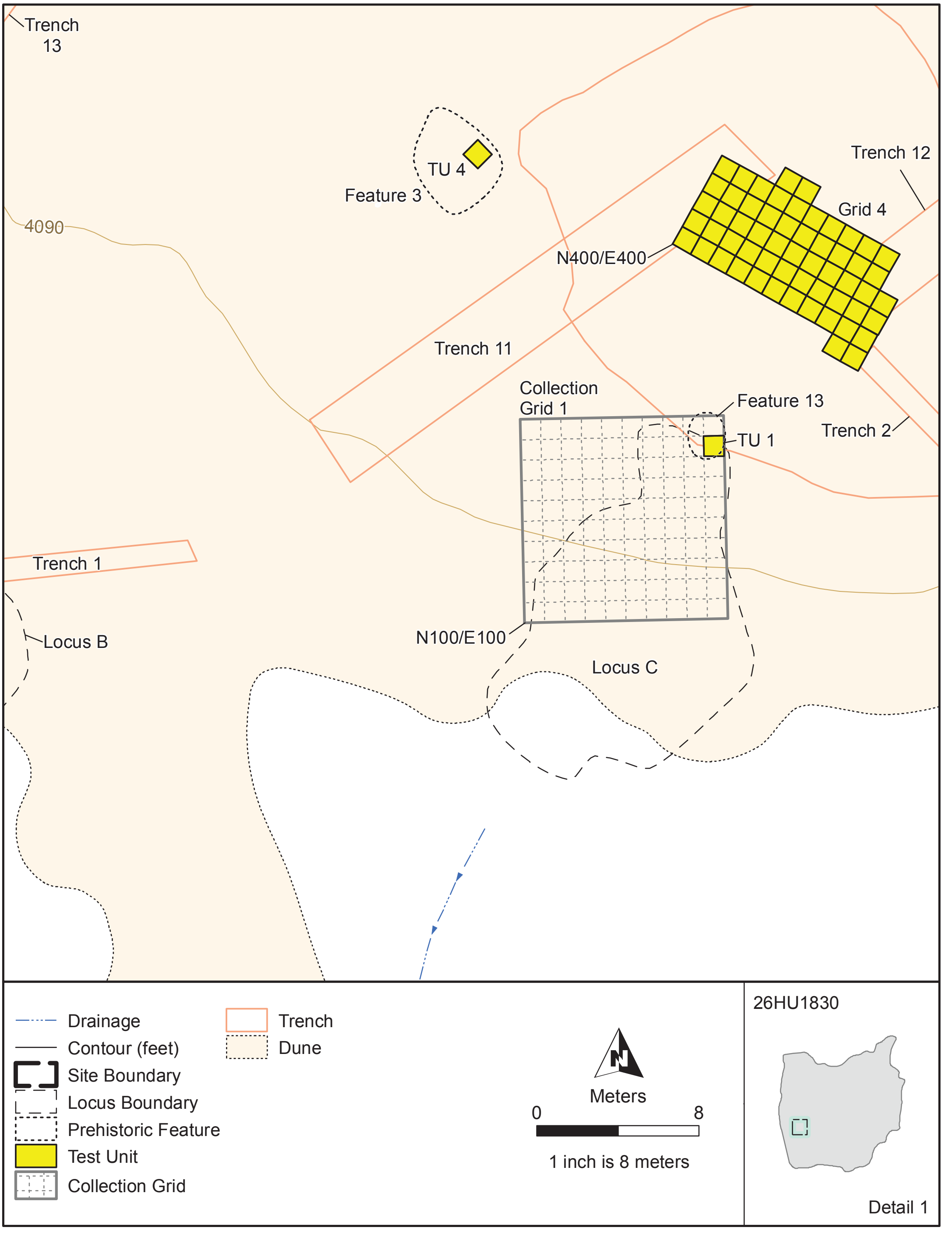


FIGURE 14 (*continued*). 26HU1830 sketch map, Detail 1.

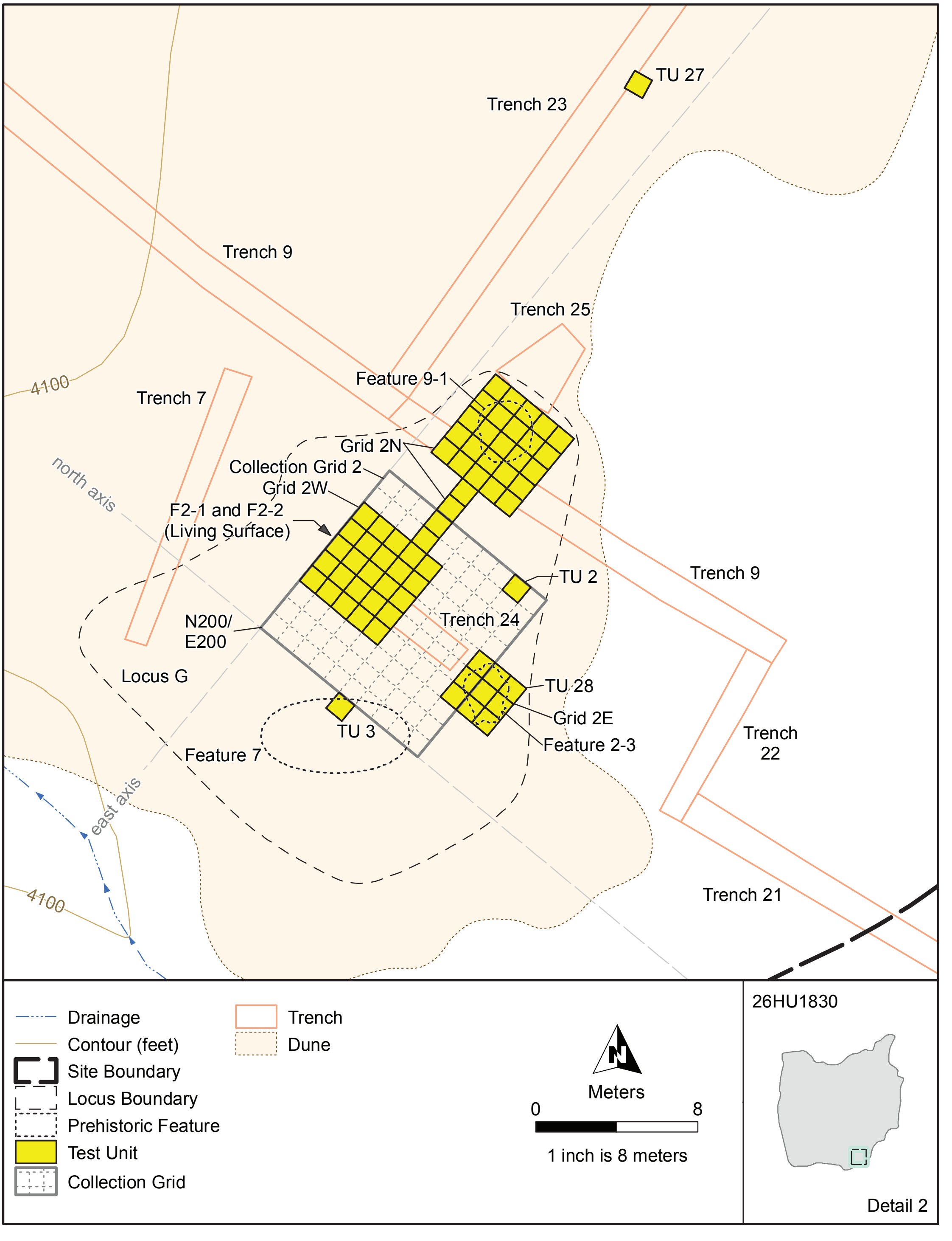


FIGURE 14 (*continued*). 26HU1830 sketch map, Detail 2.

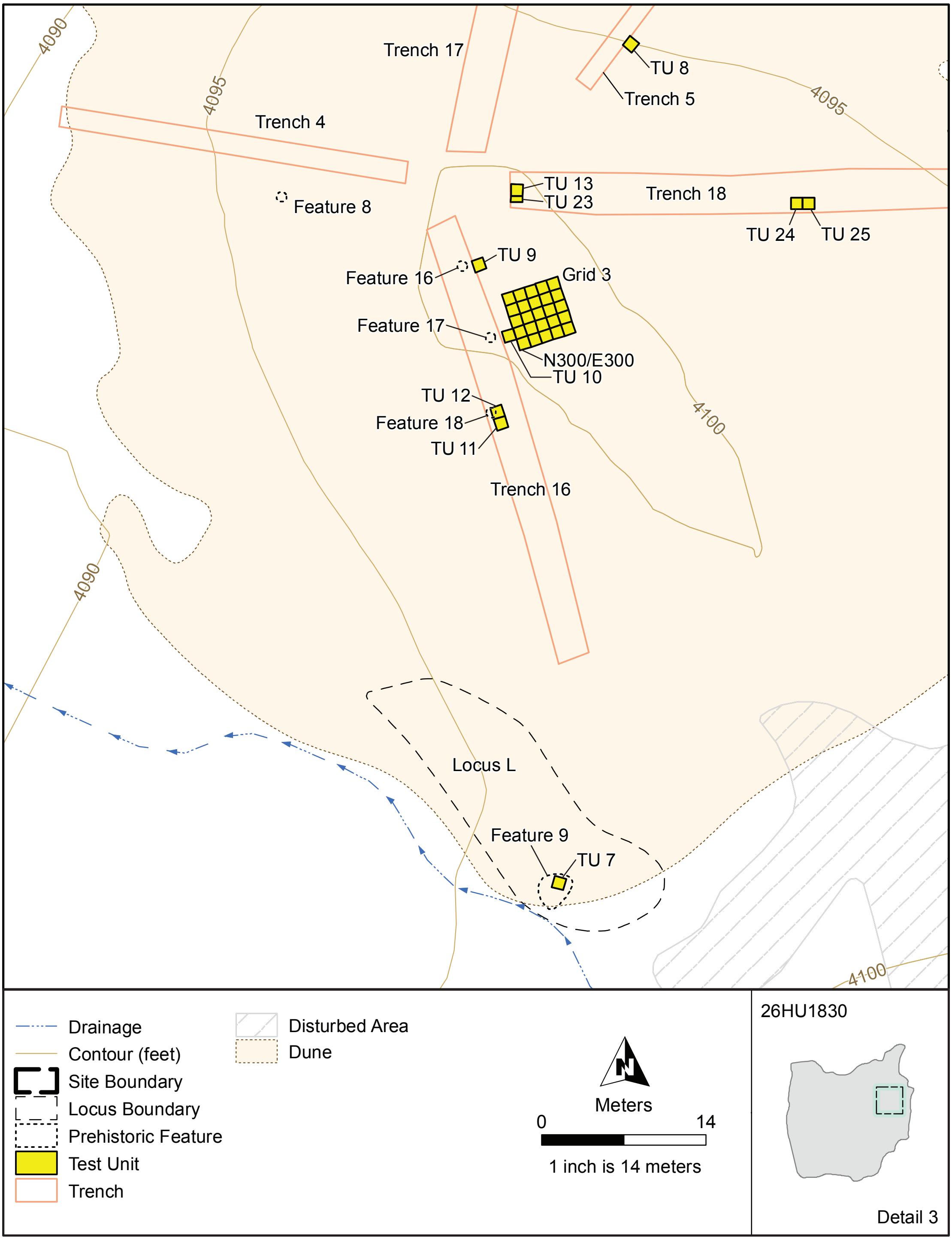


FIGURE 14 (*continued*). 26HU1830 sketch map, Detail 3.

TABLE 11
Excavation Summary for 26HU1830

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Middle Archaic (m^3)	Late Archaic A (m^3)	Noncomponent (m^3)	Total (m^3)
1	C	Grid1N108/E109		–	1.20	–	1.20
2	G	Grid2N209/E208	1 × 1	0.58	–	–	0.58
3	G	Grid2N199/E205	1 × 1	0.51	–	–	0.51
4	Nonlocus	–	1 × 1	–	0.66	–	0.66
5	Nonlocus	–	1 × 1	–	–	0.90	0.90
6	Nonlocus	–	1 × 1	–	–	0.38	0.38
7	L	–	1 × 1	–	–	0.43	0.43
8	Nonlocus	Trench 5 Adjacent	1 × 1	–	–	0.76	0.76
9	Nonlocus	Trench 16	1 × 1	–	–	1.47	1.47
10	Nonlocus	Trench 16	1 × 1	–	0.46	–	0.46
11	Nonlocus	Trench 16	1 × 1	–	–	0.08	0.08
12	Nonlocus	Trench 16	1 × 1	–	–	0.05	0.05
13	Nonlocus	Trench 18	1 × 1	–	–	0.16	0.16
14	Nonlocus	Trench 14	1 × 1	–	–	0.40	0.40
15	Nonlocus	Trench 14	1 × 1	–	–	0.37	0.37
16	Nonlocus	Trench 14	1 × 1	–	–	0.43	0.43
17	Nonlocus	Trench 14	1 × 1	–	–	0.40	0.40
18	Nonlocus	Trench 8	1 × 1	–	–	1.48	1.48
19	Nonlocus	Trench 8	1 × 1	–	–	1.47	1.47
20	Nonlocus	Trench 8	0.5 × 2.0	–	–	1.14	1.14
21	Nonlocus	Trench 10	1 × 1	–	–	0.40	0.40
22	Nonlocus	Trench 10	1 × 1	–	–	0.47	0.47
23	Nonlocus	Trench 18	0.5 × 1.0	–	–	0.08	0.08
24	Nonlocus	Trench 18	1 × 1	–	–	0.66	0.66
25	Nonlocus	Trench 18	1 × 1	–	–	0.64	0.64
27	Nonlocus	Trench 23	1 × 1	–	–	1.14	1.14
28	G	Grid 2 EastN205/E211	1 × 1	0.95	–	–	0.95
N203/E200	G	Grid 2 West	1 × 1	1.09	–	–	1.09
N203/E201	G	Grid 2 West	1 × 1	0.98	–	–	0.98
N203/E202	G	Grid 2 West	1 × 1	0.97	–	–	0.97
N203/E203	G	Grid 2 West	1 × 1	0.96	–	–	0.96
N203/E204	G	Grid 2 West	1 × 1	0.94	–	–	0.94
N203/E209	G	Grid 2 East	1 × 1	0.38	–	–	0.38
N203/E210	G	Grid 2 East	1 × 1	0.57	–	–	0.57
N203/E211	G	Grid 2 East	1 × 1	0.60	–	–	0.60
N204/E200	G	Grid 2 West	1 × 1	1.10	–	–	1.10

TABLE 11 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Middle Archaic (m^3)	Late Archaic A (m^3)	Noncomponent (m^3)	Total (m^3)
N204/E201	G	Grid 2 West	1 × 1	1.00	–	–	1.00
N204/E202	G	Grid 2 West	1 × 1	1.03	–	–	1.03
N204/E203	G	Grid 2 West	1 × 1	1.05	–	–	1.05
N204/E204	G	Grid 2 West	1 × 1	0.92	–	–	0.92
N204/E209	G	Grid 2 East	1 × 1	0.42	–	–	0.42
N204/E210	G	Grid 2 East	1 × 1	0.76	–	–	0.76
N204/E211	G	Grid 2 East	1 × 1	1.04	–	–	1.04
N205/E200	G	Grid 2 West	1 × 1	1.13	–	–	1.13
N205/E201	G	Grid 2 West	1 × 1	1.20	–	–	1.20
N205/E202	G	Grid 2 West	1 × 1	1.02	–	–	1.02
N205/E203	G	Grid 2 West	1 × 1	1.03	–	–	1.03
N205/E204	G	Grid 2 West	1 × 1	1.03	–	–	1.03
N205/E209	G	Grid 2 East	1 × 1	0.41	–	–	0.41
N205/E210	G	Grid 2 East	1 × 1	0.80	–	–	0.80
N206/E200	G	Grid 2 West	1 × 1	1.19	–	–	1.19
N206/E201	G	Grid 2 West	1 × 1	1.06	–	–	1.06
N206/E202	G	Grid 2 West	1 × 1	0.98	–	–	0.98
N206/E203	G	Grid 2 West	1 × 1	1.01	–	–	1.01
N206/E204	G	Grid 2 West	1 × 1	0.96	–	–	0.96
N207/E200	G	Grid 2 West	1 × 1	1.38	–	–	1.38
N207/E201	G	Grid 2 West	1 × 1	1.10	–	–	1.10
N207/E202	G	Grid 2 West	1 × 1	1.02	–	–	1.02
N207/E203	G	Grid 2 West	1 × 1	1.07	–	–	1.07
N207/E204	G	Grid 2 West	1 × 1	0.96	–	–	0.96
N208/E203	G	Grid 2 North	1 × 1	1.07	–	–	1.07
N209/E203	G	Grid 2 North	1 × 1	1.15	–	–	1.15
N210/E203	G	Grid 2 North	1 × 1	1.06	–	–	1.06
N211/E203	G	Grid 2 North, Trench 9	1 × 1	1.02	–	–	1.02
N212/E201	G	Grid 2 North, Trench 9	0.3 × 1.0	0.31	–	–	0.31
N212/E202	G	Grid 2 North, Trench 9	1 × 1	1.06	–	–	1.06
N212/E203	G	Grid 2 North, Trench 9	0.5 × 1.0	0.52	–	–	0.52
N212/E204	G	Grid 2 North, Trench 9	0.5 × 1.0	0.48	–	–	0.48
N212/E205	G	Grid 2 North, Trench 9	0.6 × 1.0	0.64	–	–	0.64
N213/E201	G	Grid 2 North, Trench 9	0.6 × 1.0	0.68	–	–	0.68
N213/E202	G	Grid 2 North, Trench 9	0.4 × 1.0	0.58	–	–	0.58
N213/E203	G	Grid 2 North, Trench 9	0.4 × 1.0	0.53	–	–	0.53
N213/E204	G	Grid 2 North, Trench 9	0.2 × 1.0	0.14	–	–	0.14

TABLE 11 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Middle Archaic (m^3)	Late Archaic A (m^3)	Noncomponent (m^3)	Total (m^3)
N213/E205	G	Grid 2 North, Trench 9	0.2 × 1.0	0.22	–	–	0.22
N214/E201	G	Grid 2 North	1 × 1	1.05	–	–	1.05
N214/E202	G	Grid 2 North, Trench 9	1 × 1	1.27	–	–	1.27
N214/E203	G	Grid 2 North, Trench 9	1 × 1	0.97	–	–	0.97
N214/E204	G	Grid 2 North, Trench 9	1 × 1	0.65	–	–	0.65
N214/E205	G	Grid 2 North	1 × 1	1.05	–	–	1.05
N215/E201	G	Grid 2 North	1 × 1	1.10	–	–	1.10
N215/E202	G	Grid 2 North, Trench 9	1 × 1	1.40	–	–	1.40
N215/E203	G	Grid 2 North	1 × 1	1.33	–	–	1.33
N215/E204	G	Grid 2 North, Trench 9	1 × 1	0.70	–	–	0.70
N215/E205	G	Grid 2 North	1 × 1	1.02	–	–	1.02
N216/E201	G	Grid 2 North	1 × 1	1.20	–	–	1.20
N216/E202	G	Grid 2 North	1 × 1	1.40	–	–	1.40
N216/E203	G	Grid 2 North, Trench 9	1 × 1	0.93	–	–	0.93
N216/E204	G	Grid 2 North, Trench 9	1 × 1	0.86	–	–	0.86
N216/E205	G	Grid 2 North, Trench 9	1 × 1	1.15	–	–	1.15
N300/E300	Nonlocus	Grid 3	1 × 1	0.50	0.80	–	1.30
N300/E301	Nonlocus	Grid 3	1 × 1	0.50	0.73	–	1.23
N300/E302	Nonlocus	Grid 3	1 × 1	0.40	0.75	–	1.15
N300/E303	Nonlocus	Grid 3	1 × 1	0.40	0.75	–	1.15
N300/E304	Nonlocus	Grid 3	1 × 1	0.50	0.72	–	1.22
N301/E300	Nonlocus	Grid 3	1 × 1	0.50	0.72	–	1.22
N301/E301	Nonlocus	Grid 3	1 × 1	1.30	0.72	–	2.02
N301/E302	Nonlocus	Grid 3	1 × 1	1.20	0.80	–	2.00
N301/E303	Nonlocus	Grid 3	1 × 1	1.20	0.79	–	1.99
N301/E304	Nonlocus	Grid 3	1 × 1	0.50	0.76	–	1.26
N302/E300	Nonlocus	Grid 3	1 × 1	0.40	0.80	–	1.20
N302/E301	Nonlocus	Grid 3	1 × 1	1.20	0.78	–	1.98
N302/E302	Nonlocus	Grid 3	1 × 1	1.20	0.79	–	1.99
N302/E303	Nonlocus	Grid 3	1 × 1	1.20	0.79	–	1.99
N302/E304	Nonlocus	Grid 3	1 × 1	0.40	0.76	–	1.16
N303/E300	Nonlocus	Grid 3	1 × 1	0.50	0.73	–	1.23
N303/E301	Nonlocus	Grid 3	1 × 1	1.30	0.72	–	2.02
N303/E302	Nonlocus	Grid 3	1 × 1	1.80	0.80	–	2.60
N303/E303	Nonlocus	Grid 3	1 × 1	1.60	0.79	–	2.39
N303/E304	Nonlocus	Grid 3	1 × 1	0.50	0.75	–	1.25
N304/E300	Nonlocus	Grid 3	1 × 1	0.50	0.77	–	1.27

TABLE 11 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Middle Archaic (m³)	Late Archaic A (m³)	Noncomponent (m³)	Total (m³)
N304/E301	Nonlocus	Grid 3	1 × 1	0.50	0.80	–	1.30
N304/E302	Nonlocus	Grid 3	1 × 1	0.50	0.81	–	1.31
N304/E303	Nonlocus	Grid 3	1 × 1	0.20	0.80	–	1.00
N304/E304	Nonlocus	Grid 3	1 × 1	0.30	0.74	–	1.04
N399/E409	Nonlocus	Grid 4	1 × 1	–	1.31	–	1.31
N399/E410	Nonlocus	Grid 4	1 × 1	–	1.24	–	1.24
N400/E400	Nonlocus	Grid 4	1 × 1	–	1.15	–	1.15
N400/E401	Nonlocus	Grid 4	1 × 1	–	1.17	–	1.17
N400/E402	Nonlocus	Grid 4	1 × 1	–	1.18	–	1.18
N400/E403	Nonlocus	Grid 4	1 × 1	–	1.14	–	1.14
N400/E404	Nonlocus	Grid 4	1 × 1	–	1.19	–	1.19
N400/E405	Nonlocus	Grid 4	1 × 1	–	1.14	–	1.14
N400/E406	Nonlocus	Grid 4	1 × 1	–	1.08	–	1.08
N400/E407	Nonlocus	Grid 4	1 × 1	–	1.05	–	1.05
N400/E408	Nonlocus	Grid 4	1 × 1	–	1.10	–	1.10
N400/E409	Nonlocus	Grid 4	1 × 1	–	1.22	–	1.22
N400/E410	Nonlocus	Grid 4	1 × 1	–	1.31	–	1.31
N401/E400	Nonlocus	Grid 4, Trench 11	1 × 1	–	1.00	–	1.00
N401/E401	Nonlocus	Grid 4	1 × 1	–	1.09	–	1.09
N401/E402	Nonlocus	Grid 4	1 × 1	–	1.18	–	1.18
N401/E403	Nonlocus	Grid 4	1 × 1	–	1.23	–	1.23
N401/E404	Nonlocus	Grid 4	1 × 1	–	1.54	–	1.54
N401/E405	Nonlocus	Grid 4	1 × 1	–	1.51	–	1.51
N401/E406	Nonlocus	Grid 4	1 × 1	–	1.37	–	1.37
N401/E407	Nonlocus	Grid 4	1 × 1	–	1.32	–	1.32
N401/E408	Nonlocus	Grid 4, Trench 12	1 × 1	–	1.30	–	1.30
N401/E409	Nonlocus	Grid 4, Trench 12	1 × 1	–	1.36	–	1.36
N401/E410	Nonlocus	Grid 4	1 × 1	–	1.20	–	1.20
N402/E400	Nonlocus	Grid 4, Trench 11	1 × 1	–	1.00	–	1.00
N402/E401	Nonlocus	Grid 4	1 × 1	–	1.06	–	1.06
N402/E402	Nonlocus	Grid 4	1 × 1	–	1.37	–	1.37
N402/E403	Nonlocus	Grid 4	1 × 1	–	1.44	–	1.44
N402/E404	Nonlocus	Grid 4	1 × 1	–	1.47	–	1.47
N402/E405	Nonlocus	Grid 4	1 × 1	–	1.46	–	1.46
N402/E406	Nonlocus	Grid 4	1 × 1	–	1.34	–	1.34
N402/E407	Nonlocus	Grid 4	1 × 1	–	1.19	–	1.19
N402/E408	Nonlocus	Grid 4, Trench 12	1 × 1	–	0.90	–	0.90

TABLE 11 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Middle Archaic (m^3)	Late Archaic A (m^3)	Noncomponent (m^3)	Total (m^3)
N402/E409	Nonlocus	Grid 4, Trench 12	1 × 1	–	0.74	–	0.74
N402/E410	Nonlocus	Grid 4, Trench 12	1 × 1	–	0.77	–	0.77
N403/E400	Nonlocus	Grid 4, Trench 11	1 × 1	–	0.91	–	0.91
N403/E401	Nonlocus	Grid 4, Trench 11	1 × 1	–	1.18	–	1.18
N403/E402	Nonlocus	Grid 4	1 × 1	–	1.28	–	1.28
N403/E403	Nonlocus	Grid 4	1 × 1	–	1.48	–	1.48
N403/E404	Nonlocus	Grid 4	1 × 1	–	1.40	–	1.40
N403/E405	Nonlocus	Grid 4	1 × 1	–	1.31	–	1.31
N403/E406	Nonlocus	Grid 4	1 × 1	–	1.20	–	1.20
N403/E407	Nonlocus	Grid 4	1 × 1	–	1.03	–	1.03
N403/E408	Nonlocus	Grid 4, Trench 12	1 × 1	–	0.90	–	0.90
N403/E409	Nonlocus	Grid 4, Trench 12	1 × 1	–	0.35	–	0.35
N404/E400	Nonlocus	Grid 4	1 × 1	–	1.04	–	1.04
N404/E401	Nonlocus	Grid 4	1 × 1	–	1.31	–	1.31
N404/E402	Nonlocus	Grid 4	1 × 1	–	1.42	–	1.42
N404/E403	Nonlocus	Grid 4	1 × 1	–	1.45	–	1.45
N404/E404	Nonlocus	Grid 4	1 × 1	–	1.35	–	1.35
N404/E405	Nonlocus	Grid 4	1 × 1	–	1.18	–	1.18
N404/E406	Nonlocus	Grid 4	1 × 1	–	1.05	–	1.05
N404/E407	Nonlocus	Grid 4	1 × 1	–	0.93	–	0.93
N404/E408	Nonlocus	Grid 4, Trench 12	1 × 1	–	0.85	–	0.85
N404/E409	Nonlocus	Grid 4, Trench 12	1 × 1	–	0.72	–	0.72
N405/E403	Nonlocus	Grid 4	0.5 × 1.0	–	0.44	–	0.44
N405/E404	Nonlocus	Grid 4	0.5 × 1.0	–	0.39	–	0.39
Total				77.84	86.78	13.31	177.93

consists mainly of obsidian debitage. No tools or fire-affected rock were recorded, although Feature 13, a surface fire-affected rock feature, is located immediately to the north.

Locus D. This locus is situated between Loci E and F in a deflated dune area in the southeastern area of the site. Measuring roughly 13 × 10 m, it consists of about 120 flakes, of which 90% are CCS. One biface was reported from the surface of this area during previous studies but could not be relocated.

Locus E. This concentration is located on the south side of an eroding dune in the south-central portion of the site. It measures 12 × 12 m and consists of a light scatter of flakes and tools, as well as fire-affected rock. Tools include several pieces of ground stone, bifaces, and modified flakes. Most of the approximately 100 unmodified flakes observed in the locus were CCS.

Locus F. This area is a relatively large (18 × 60 m) concentration of lithics located on the eastern margin of the site. Most of the material observed was debitage (primarily CCS), although some obsidian was also documented. Several bifaces were also recorded, although no fire-affected rock was noted.

Locus G. This medium-sized concentration (20 × 16 m) is located along the southern margin of the site on a dune and adjacent deflation pan. It encompasses a small number of flaked and ground stone tools, CCS and obsidian flakes in nearly equal quantity, and Feature 7, a dense concentration of fire-affected rock and tools located on the deflation pan.

Locus H. This area is a small scatter of CCS flakes located along the southeast margin of the site adjacent to Locus G. No tools or fire-affected rock were observed.

Locus I. This small flake concentration is situated in the northeast portion of the site, adjacent to Locus J. It measures 7 × 10 m and is located on the southeast exposure of a dune surface. Debitage is divided among CCS (70%) and obsidian (30%). No tools or fire-affected rock were observed.

Locus J. This area is a very small flake concentration located in the northeastern site area. Measuring no more than 2 × 3 m, it consists of about 35 CCS flakes. No tools or fire-affected rock were noted.

Locus K. This area is a very small flake concentration located in a deflated pan along the southern boundary of the site. Measuring no more than 7 × 4 m, it consists of about 20 CCS flakes. No tools or fire-affected rock were noted.

Locus L. This concentration is located along the eastern margin of the site, and incorporates Feature 9, a diffuse fire-affected rock scatter associated with flakes, calcined bones, and tooth fragments. The locus measures 8 × 27 m and is located primarily on dune deposits. More than 500 flakes were recorded, of which most (85%) are CCS and the remainder obsidian. A small number of flaked and ground stone tools were also recorded.

Locus M. Measuring 54 × 43 m, this locus is situated in the central portion of the site. It is defined by a scatter of about 300 CCS and obsidian flakes and a number of flaked stone tools. No fire-affect rock was observed.

Surface Features: A total of 15 surface features was recorded at 26HU1830, consisting of 13 fire-affected rock concentrations and two historic-era mining claims (table 12). The fire-affected rock concentrations range from approximately one to 42 m^2 in area and may contain more than 200 rocks, although more typically they contain between 30 and 50 rocks. Associated cultural material often includes a small number of flakes and, in some cases, tools such as bifaces. It is unclear, however, whether such items are directly associated with feature use, or simply reflect a fortuitous depositional association within the larger site area. Many appear to have been affected by erosion and redeposition characteristic of dune deposits.

Subsequent excavations at 26HU1830 have revealed many intact subsurface thermal features characterized by fire-affected rock, charcoal and charcoal-stained deposits, and in some cases faunal remains. These have been interpreted as hearths or processing features. In all likelihood, many of the surface features encountered at the site are remnants of these same activities.

Subsurface Site Structure: In general, three strata are observed at 26HU1830 and throughout the Sulphur Springs dune field. These are typically aeolian strata differentiated by soil development formed during intervals of dune stability. Trenches excavated into alluvial deposits beneath or at dune margins generally have four or more strata. Trench exposures reveal multiple buried soils or paleosols, periods of relatively landscape stability, and intervening episodes of erosion and deposition. The archaeological context of the Grid 2 exposure is locally unique in that it rests on and in mixed low-energy alluvium (spring outwash or fan sheetflow) and aeolian deposits, truncated in places by higher energy alluvium, all of which is capped by late aeolian dune. In other concentrations, archaeological deposits are confined to deep, late dunes or are present as lag assemblages in blowouts or interdune playettes.

Grid 2 Habitation Area (see fig. 14, Detail Map 2). This area exhibits three primary elements: the Grid 2 North and Feature 9-1 House Structure; Grid 2 West Feature 2-1 and 2-2 Living Area; and the Grid 2 East Feature 2-3 Hearth

TABLE 12
Surface Feature Summary for 26HU1830
Contains no subsurface findings where test units were dug. Area/locus/unit associations tentative; waiting for agreed-upon spatial nomenclature. BHT = backhoe trench; Conc. = concentration.

Feature	Association	Dimension	Diagnostics	Surface Descriptions, Associations, and Comments
Fire-affected rock concentration				
1	BHT 14 Area	7.0 × 6.0 m	None	200+ FAR, 20 flakes
2	Grid 4 Area	2.5 × 1.0 m	None	20 FAR
3	Grid 4 Area, TU 4	4.0 × 3.5 m	None	30+ FAR, 18 flakes
4	Grid 4 Area, TU 5	2.0 × 2.5 m	None	30+ FAR, 5 flakes
5	None	4.0 × 2.0 m	None	20+ FAR, 1 biface, 3 flakes
6	BHT 10 Area	3.0 × 4.0 m	None	75+ FAR, 1 flake
7	Conc. G	4.0 × 8.0 m	None	60+ FAR, 9 tools
8	BHT 4 Area	1.0 × 1.0 m	None	5 FAR, 4 flakes
9	Conc. L, TU 7	3.0 × 3.0 m	None	30+ FAR, flakes, calcined bone
10	None	no data	None	Previously recorded but could not be relocated
11	TU 6	4.5 × 4.5 m	None	75+ FAR, 3 flakes
12	BHT 15 Area	4.0 × 3.0 m	None	30+ FAR, 1 flake
13	Grid 4 Area, TU 1	2.5 × 2.0 m	None	30+ FAR
Claim marker				
14	None	21.0 × 22.0 in	Historic era	Rock cairn with collapsed post
15	None	n/a	Historic era	Wooden claim Post

Area. All three are located within close proximity of one another, and all appear to be about 3000 years old. Together, they represent an early Middle Archaic habitation area.

Stratigraphic profiles of Grid 2 show multiple, weakly developed, buried paleosols (Ak-2Bwk-3Bwk-4Bwk) on four sedimentary strata; these rest on an eroded, moderately developed Pleistocene paleosol (5Btk) that underlies archaeological excavations and trenches in this area. The strata (figs. 15, 16) are:

Stratum I. This basal stratum consists of a massive to weakly bedded fine to medium sand. The 5Btk paleosol on Stratum I is a reddened horizon with weak to moderately developed, subangular blocky peds, with distinct, patchy-to-continuous clay films lining pores, on pedfaces, and bridging grains. Calcium carbonate is disseminated in the soil matrix.

Stratum II. This is a thick stratum of massive to bedded fine to very fine sand with numerous discrete sand and gravel lenses. It reaches a meter thick in places (at the east and north edge of Grid 2), but is truncated by matrix-supported flow remnants to the north, clearly evident in Trench 23. The stratum is generally about 40 to 50 cm thick. Where portions of the upper stratum remain, the bedded fine sand and gravel lenses show a moderately developed 4Bwk; however, there is subtle evidence for soil development (e.g., slight reddening), suggesting that numerous pauses in deposition may be present within the stratum.

Stratum III. The overlying layer is very similar to Stratum II. Interbedded, upwardly fining, fine to medium sand and silt laminations show thin and discontinuous silt and clay lining and drapes on ripples. Small channels of matrix-supported, poorly sorted gravels to 2.5 cm in diameter and general gravel lag line the lower contact. The stratum is highly turbated with filled burrows (krotovina) throughout; lithic debitage is com-

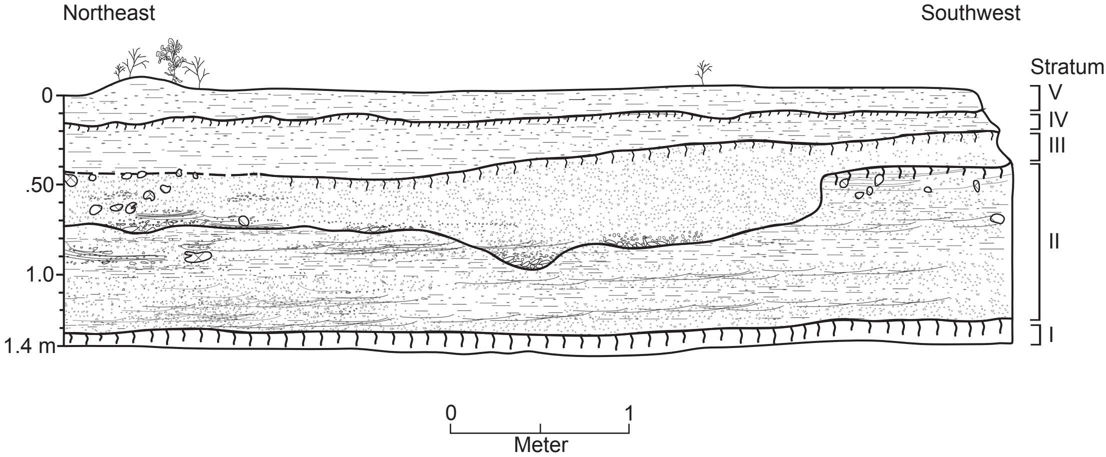


FIGURE 15. 26HU1830 north profile of Trench 23 in vicinity of Grid 2. Based on original illustration courtesy of Thomas F. Bullard.

mon in the matrix and burrows. Stratum III appears to have at least two distinct phases of deposition separated by a brief period of stability, which allowed weak and incipient soils to develop (3Bwk). The stratum is typically 15 to 30 cm thick.

Stratum IV. This is a massive to locally bedded, very fine to coarse, poorly sorted sand. The deposit coarsens upward in small packages, usually 5 to 10 mm thick; each set is capped by silt and clay laminations 1 to 2 mm thick. Small channels of coarse sand are present throughout the stratum. However, the internal stratigraphy of Stratum IV is often disturbed by prevalent bioturbation. Remnants of a weak to moderately developed soil (2Avk–2Bwk–Ck) are present, but the upper part of the soil has been removed by erosion (i.e., only 2Bwk present) in places. This is generally a flat-lying stratum varying in thickness from 20 to 35 cm; it thickens to the north. The cultural features of Grid 2 are in this stratum.

Stratum V. The cultural features contained in Stratum IV are buried by the capping Stratum V, a massive to locally laminated fine to very fine sand and silt. This stratum has a very weak Av–Ck soil profile. The aeolian deposit is bioturbated.

Grid 2 North and the Feature 9-1 House Structure. This feature was originally recognized as a charcoal stain in the north wall of Backhoe Trench 9, but wasn't identified as a house structure (Feature 9-1) until subsequent excavation of a larger 5 × 5 m exposure (Grid 2 North, 212–216N/201–205E; fig. 17). In addition, a 1 × 4 m trench (208–211N/E203) was excavated, connecting this exposure with the Feature 2-1 and 2-2 Living Area. Feature 9-1 was excavated stratigraphically, and included the removal of a postoccupational fill zone (fig. 18) exposing the surface of the feature floor.

The feature is centrally located within the exposure, measures approximately 3.0 m in diameter, and is circular in plan. The floor is roughly 10 cm thick with somewhat stronger development near its perimeter, where it appears to have been cut into the underlying substrate. Patches of soil oxidation and a number of large rocks were observed within the floor fill and underlying matrix. As reported elsewhere, the floor also yielded a comparatively higher density of artifacts and animal bone. The floor was excavated according to quadrant; a series of soil samples were obtained from the floor prior to and during excavation.

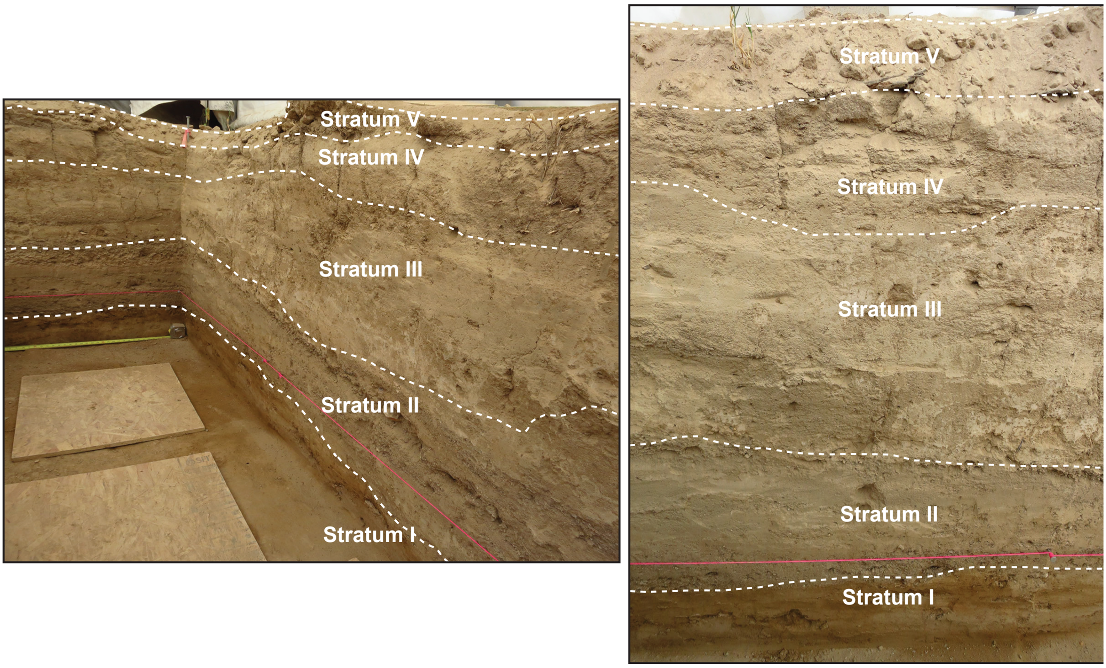


FIGURE 16. 26HU1830 Photographic rendering of stratigraphy of Grid 2 extension. Photos courtesy of Thomas F. Bullard.

A number of subfeatures were documented on the floor, including 16 small, round, charcoal stains; these were found along the perimeter of the structure and are interpreted as "post-holes" that supported the superstructure of the house. A central hearth was also recorded, as well as two pits, and a series of depressions. Subfeatures were excavated as separate analytical units.

Two radiocarbon dates were obtained from the floor of Feature 9-1 (table 13): 2976 cal B.P. (Beta-357808) and 3006 cal B.P. (Beta-357809). In addition, 20 projectile points, of which 13 were diagnostic, were recovered from Feature 9-1 and the surrounding Grid 2 North area. The diagnostic points include nine Elko series, two Gatecliff, as well as single examples of lanceolate and Great Basin Stemmed series points. The predominance of Elko series points is in keeping with the Middle Archaic time frame indicated by the radiocarbon dates. Nine *Olivella* shell beads were also recovered from the Grid 2 North exposure. These include four "C2" specimens with suggested time spans of 2150–1530 cal B.P. or 930–685 cal B.P. (Groza et al., 2011; Bennyhoff and Hughes, 1987). The earlier dating bracket appears to be more consistent with the other Middle Archaic chronological data sets from this context (table 14). A single A1b bead was also recovered; this bead dates anywhere from 3500 cal B.P. to the Contact Period. The remaining beads are mostly of indeterminate type. In sum, chronological information from the Feature 9-1 house structure and the surrounding Grid 2 North exposure indicates a strong Middle Archaic occupation.

Grid 2 West Feature 2-1 and 2-2 Living Area. This area includes two discrete feature areas (2-1 and 2-2) and adjacent cultural deposits. The entire area was excavated as a 5 × 5 m exposure (Grid 2 West; 203–207N/200–204E; see fig. 14: Detail Map 2). All units were excavated by 10 cm level to a depth of 100 cm below surface; select units were excavated to depths ranging between 110 and 140 cm below surface.

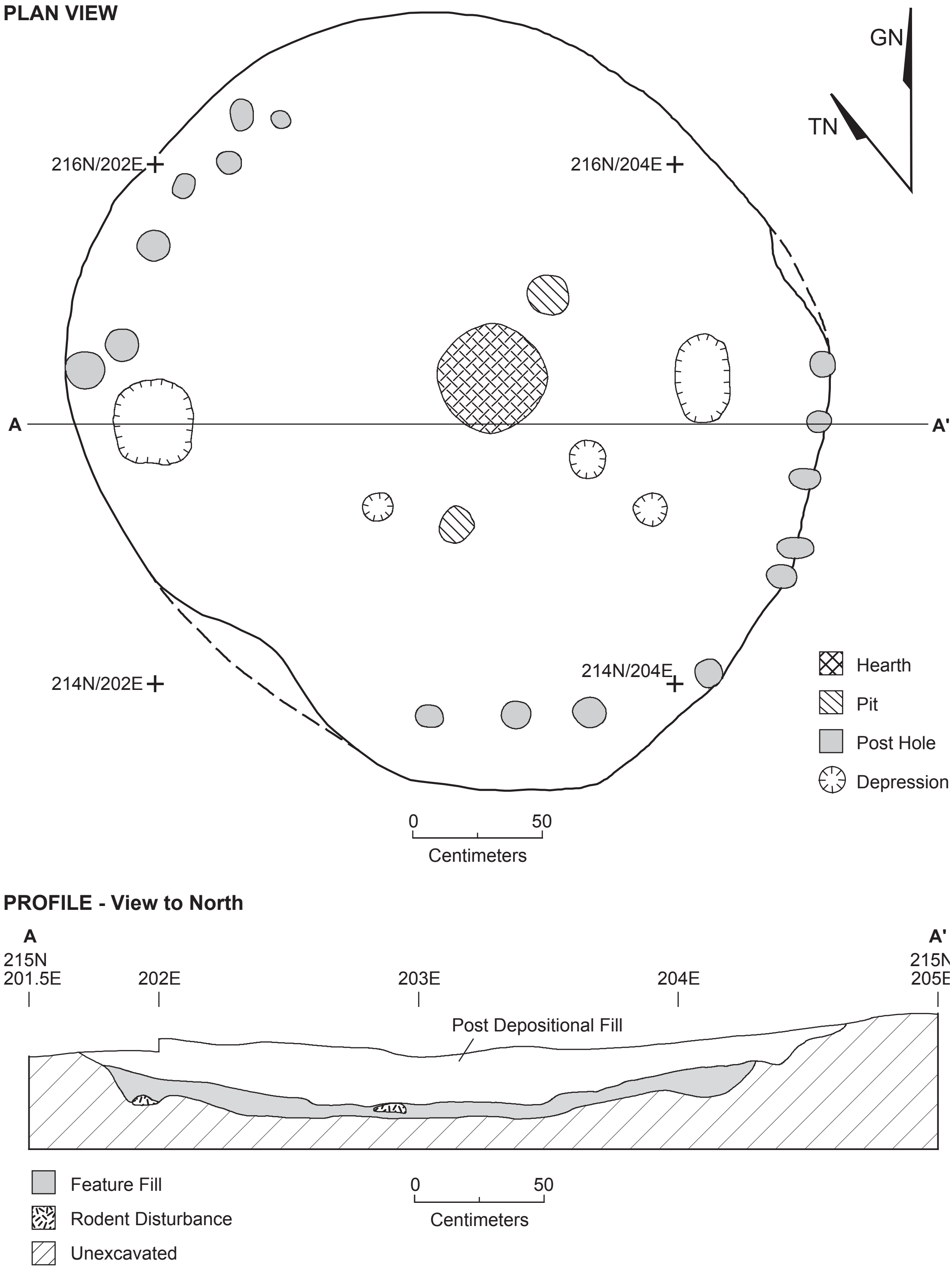


FIGURE 17. 26HU1830 Feature 9-1, house structure.

FIGURE 18. 26HU1830 Grid 2 exposure overview preexcavation.

Feature 2-1 was first recognized as a concentration of rock (not fire affected) at about 20–30 cm below the ground surface in Units 204N/20–203E and 205/201–202E, and measuring 1.09 × 1.86 m in plan. Feature 2-2 is a very small but eclectic artifact concentration observed in 207N/E201 at 35–50 cm below the ground surface. Associated artifacts include ground stone, handstones, bifaces, several formed flake tools, a modified obsidian flake, and large bone fragments, as well as debitage. The feature has no distinct fill or outline, and appears to be the remnants of small activity/processing area.

A single radiocarbon date of 2945 cal B.P. (Beta-387621) was obtained from the Feature 2-1 and 2-2 Living Area statistically contemporaneous with the Feature 9-1 house structure. A total of 12 time-sensitive projectile points was recovered from Grid 2 West, including nine Elko series, two Rosegate, and one indeterminate variant. Again, these data point to a strong Middle Archaic use of the Grid 2 West Feature 2-1 and 2-2 Living Area.

Grid 2 East Feature 2-3 Hearth Area. This feature, located about 12 m south of the Feature 9-1 house structure, was discovered some 50 cm below the ground surface during test unit excavation, and was subsequently uncovered within a 3 × 3 m block exposure (Grid 2E, 203–205N and 209–211E; see fig. 14: Detail Map 2). It is a shallow basin, measuring 2.78 × 2.54 m in plan, and extends about 43 cm from top to bottom in vertical profile. The feature fill consists of a complex matrix of mottled, charcoal-stained deposit with pink-orange oxidation observed along its margins in some areas. The fill deposit contains a large number of small bone fragments, as well as small fire-affected rock fragments. It also appears to have a central core (Subfeature 2-3.2) that that is rimmed by a more diffuse charcoal-stained deposit.

TABLE 13
Radiocarbon Dates from 26HU1830
TU = Test Unit.

Cat. No.	Locus	Provenience	Feature	Level	Lab. No. (Beta-)	Sample Description	Delta ^{13}C	Conventional Age (B.P.)	Error	Median Probability (cal B.P.)	2σ Range
20061	–	Feature 17	17	–	386898	Rabbitbrush charcoal	-23.1	1230	±30	1165	1068–1261
20064	–	Feature 4-4	4-4	–	386900	Greasewood charcoal	-23.4	1330	±30	1273	1184–1301
20065	–	Feature 4-5	4-5	–	386901	Greasewood charcoal	-22.7	1360	±30	1290	1188–1334
20063	–	Feature 4-3.1	4-3.1	–	386899	Greasewood charcoal	-21.8	1410	±30	1317	1285–1359
20066	–	Feature 4-6	4-6	–	386902	Greasewood charcoal	-21.8	1450	±30	1340	1299–1389
18004	G	TU N207/E201	2-2	5	387621	Mammal bone	-18.2	2840	±30	2945	2866–3056
20067	G	Feature 9-1	9-1	3	357808	Greasewood charcoal	-23.3	2860	±30	2976	2879–3066
20068	G	Feature 9-1	9-1	3	357809	Greasewood charcoal	-22.1	2880	±30	3006	2888–3079
20062	G	Feature 2-3	2-3	–	386897	Greasewood charcoal	-23.6	2930	±30	3081	2976–3168

TABLE 14
Modified Bone and Shell from 26HU1830

Material	Type	cal B.P. Range	Middle Archaic	Late Archaic A	Noncomponent	Total
Shell bead						
Olivella	A1b	5500–contact	–	–	1	1
Olivella	C2	2150–1530; 930–685	4	–	–	4
Olivella	Possible C or E	–	1	–	–	1
Olivella	Indeterminate	–	4	–	–	4
Bone bead						
Hare, black-tailed	Tube	–	1	–	–	1
Mammal, medium	Tube	–	1	–	–	1
Mammal, indeterminate	Tube	–	1	–	–	1
Bone awl						
Mammal, indeterminate	–	–	1	–	–	1
Modified bone						
Mammal, large	Indeterminate	–	6	–	–	6
Mammal, indeterminate	Indeterminate	–	12	–	–	12
Vertebrate, indeterminate	Indeterminate	–	1	1	–	2
Total			32	1	1	34

Additionally, there is a discrete charcoal stained pocket situated in proximity to Subfeature 2-3.2 that is interpreted as "clean-out" deposit associated with the hearth. Given these attributes, it probably functioned as a hearth/processing feature.

A single radiocarbon date was obtained from charcoal fragments recovered from the feature. It returned a date of 3081 cal B.P. (Beta-386897), again contemporaneous with the Middle Archaic Feature 9-1 house structure and Feature 2-1 and 2-2 living surface. Seven projectile points were recovered from this area, four Elko series variants and three indeterminate, again substantiating the Middle Archaic time frame for the use of this area.

Grid 3 Midden Area. The Grid 3 exposure consists of a 5 × 5 m excavation (300–304N/300–304E), in addition to test unit TU 10 (1 × 1 m), which abuts the exposure just south of the 300N line (see fig. 14: Detail Map 3; fig. 19). The exposure was excavated as a series of 1 × 1 m units. Each unit was excavated to a depth of between 100 and 300 cm below ground surface, depending on yield.

Backhoe trenches in the area of Grid 3 exposed low dunes and sand sheets, with the dune's western margin showing the influence of wet-dry moisture cycles contained in a small playette basin (figs. 20, 21). The stratigraphic trenches were typically about a meter deep and three primary strata were recognized. The Stratum I soil (3Bwk – Ck) is moderately developed; its A horizon has been removed by erosion. The soil formed on Stratum II is similar (2B2k – Ck) but is weakly developed; it's A horizon is also scoured. Stratum III is a thin, relatively young aeolian deposit capping the dune area.

The subsurface potential of this area was first recognized in Backhoe Trench 16 with the discovery of Feature 17, an amorphous pocket of charcoal-stained deposit and fire-affected rock situated roughly 20–40 cm below an undulating dune surface. This feature was identified during excavation of test unit TU 10, and during subsequent exposure of Grid 3. Feature 17 yielded a radiocarbon date of 1165 cal B.P. Several similar pockets of discolored soil and fire-affected rock

FIGURE 19. 26HU1830 Grid 3 exposure overview.

were identified in Backhoe Trench 16 (Features 16 and 18) but not formally tested.

No other features or radiocarbon assays were obtained from Grid 3; however, there is a vertical profile of projectile point types that suggests the presence of two spatiotemporal components. The upper component, Strata III and II, extending to about 80 cm below surface, yielded the aforementioned radiocarbon date and four Rosegate series projectile points; whereas a single Gatecliff and four Elko series points were recovered from below 90 cm in Stratum I. Thus, there is a stratigraphic break at about 80 cm below the surface corresponding to the change in point types. In sum, two components are recognized in the Grid 3 exposure: an upper Late Archaic deposit corresponding to Strata II and III and radiocarbon dated to 1165 cal B.P., and a lower Middle Archaic deposit below the 80 cm level and corresponding to Stratum I.

There is some additional support for this stratachronological relationship in the form of two optical luminescence dates obtained from Grid 3 (see McGuire et al., 2017, for a discussion of this analysis). The stratigraphically inferior sample, obtained from a Stratum I sediment sample from TU N303/E302 returned a date of 5680 ± 580 B.P., whereas the stratigraphically superior sample, obtained from Stratum II sediments in TU N303/E300 were dated to 1500 ± 200 B.P. While the lower date is slightly older than the Middle Archaic profile provided by the projectile points, it has a relatively large standard error and probably should be treated with some caution. The later date is compatible with the Late Archaic radiocarbon and point data associated with Strata II and III.

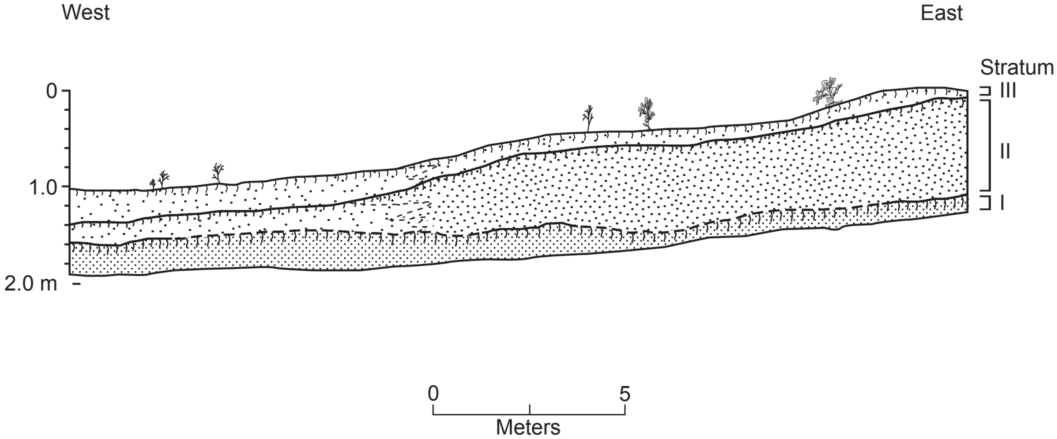


FIGURE 20. 26HU1830 Trench 4 profile, Grid 3 midden area. Based on original illustration courtesy of Thomas F. Bullard.

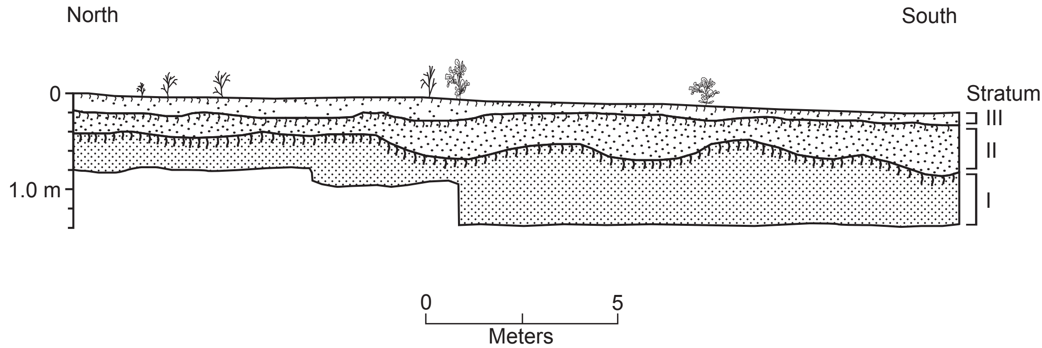


FIGURE 21. 26HU1830 Trench 16 profile, Grid 3. Based on original illustration courtesy of Thomas F. Bullard.

Grid 4 Midden Feature Area. Deposits in this area are composed of overlapping sand and silty sand strata at least 1.5 m deep (fig. 22). As exposed in Trench 2, four strata comprise the higher portion of this zone, grading to interfingering silts and sands at the dune margin at the eastern end of the trench. Although field notes document "soil breaks," the degree of past soil development cannot be discerned from the profiles. It is, however, likely that the deposits in this area correlate with the dune-building evident in Stratum II at Grid 3 and, indeed, date to roughly the same period.

The main focus of work in this area was conducted in a roughly rectangular exposure encompassing 404–410N/400–410E (see fig. 14: Detail Map 1). This area is located immediately northeast of Locus C. It was targeted as a result of backhoe excavations in Backhoe Trench 11 which revealed Feature 4-1, a hearth/processing feature, in the trench sidewall. Subsequent hand excavations of the exposure documented six additional features. Unit excavations within the exposure ranged in depth from 90 to 150 cm below the ground surface, depending on artifact yield. A total of 65.29 m^3 of deposit were hand-excavated from the exposure.

The dune deposits in this area appear to have attracted a great deal of prehistoric activity, as rep-

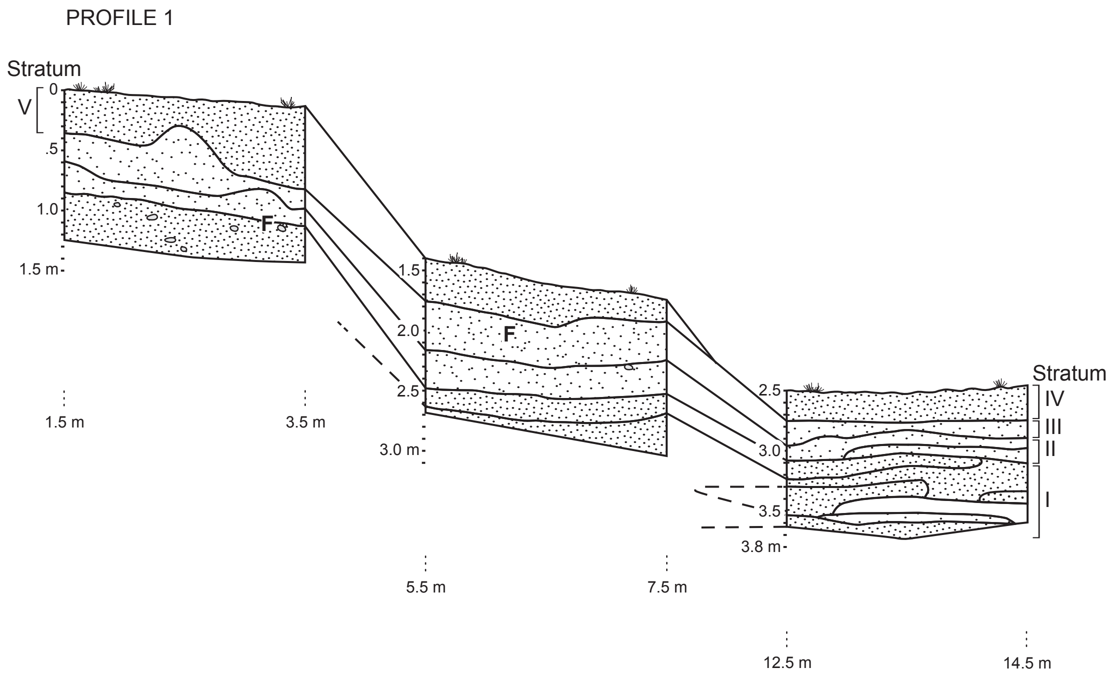


FIGURE 22. 26HU1830 Grid 4 midden area: feature area, Trench 2 profile.

resented by eight subfeatures documented in the exposure: 4-1, 4-3.1, 4-3.2, 4-4, 4-5, 4-6, 4-7, and 4-8 (table 15). Six of these are thermal features that appear to have functioned as either hearths or processing features. These are generally spatially discrete and often basin shaped in profile; some contain fire-affected rock. The remaining two features are more diffuse midden smears that may be the disturbed remnants of hearth or processing features. Most of the features contain small amounts of debitage and bone, the exception being Feature 4-3.1, which contained a large quantity of debitage (*n* = 1460; table 16) and several bifaces and flake tools. Given this superabundance, it was thought that this feature may have been used for the heat treatment of CCS, although no such evidence was observed on materials recovered from this context.

Interestingly, of the four subfeatures radiocarbon dated, all returned dates between 1330 and 1450 cal B.P. (see table 13), suggesting that prehistoric use of this particular part of the site occurred during a very short period of time at the beginning of the Late Archaic Period. This is confirmed by the recovery of two Rosegate projectile points from this area.

OTHER SITE CONTEXTS: There are a number of other surface and subsurface contexts at the site that produced materials that are not assignable to a particular time period. A small number of projectile points were recovered from these contexts, but they tend to be both temporally divergent and widely scattered and provide no clear spatio-temporal trends. For these reasons, these contexts are assigned to an atemporal, residual component (table 16).

COMPONENT DEFINITION AND CHRONOLOGICAL SUMMARY: An analysis of projectile points, regardless of their context, tends to mirror the component designations at the site, which rely more heavily on radiocarbon dating; Elko-series points are the most abundant (*n* = 39), with Rosegate forms a distant second (*n* = 11; table 17). There are a number of point variants recovered from the site that both pre- and postdate these Middle and Late Archaic markers. The most abundant of these outli-

TABLE 15
Midden Feature Area and Subsurface Features at 26HU1830, Grid 4
cmbs = centimeters below surface.

Subfeature	Type	Unit; Depth (cmbs)	Dimensions (cm)	Description	^{14}C Median Probability (cal B.P.)
4-1	Thermal feature	402N/400E; Maximum depth 90–100	60–70 cm diameter	Charcoal-stained deposit estimated to be roughly circular; basined in profile; some fire-affected rock. Disturbed.	None
4-3.1	Midden concentration	401–402N/408–410E; 60–90	Amorphous, lens-shaped midden concentration	Mottled, charcoal-stained deposits.	1317
4-3.2	Midden concentration	399–400N/409–410E; 90–100	Amorphously shaped but with distinct boundaries	Mottled and patchy, charcoal-stained deposits. Slightly basined in profile. Feature 4-3.1 superimposed on Feature 4-3.2.	None
4-4	Thermal feature	403–404N/402E; 50–60	45 × 30	Oval-shaped thermal stain with charcoal-stained fill and orange oxidation along its perimeter. Basin haped in profile.	1273
4-5	Thermal feature	404N/403–404E; 90–110	50 × 30	Oval-shaped thermal feature with some fire-affected rock and zones of oxidation and charcoal.	1290
4-6	Thermal feature	403–404N/403–404E; 100–130	70 × 70	The central core of the feature is triangular in shape, measuring 70 × 70 cm. It is basin shaped in profile and is complex zone of fire-affected rock, charcoal stained deposits, and rodent disturbance.	1340
4-7	Thermal feature	402–403N/406–407E; 110–120	75 × 35	The feature is oval shaped but very thin and not well developed in profile. It consists of fire-affected rock, and discontinuous charcoal stains.	None
4-8	Thermal feature	403N/404–405E; 90–120	140 × 100+	Feature described as an amorphous ash concentration with pockets of charcoal staining and oxidation. Rodent disturbed.	None

ers are Gatecliff and Humboldt forms ($n = 5$ and 6, respectively), which are generally considered to be Early Archaic markers. Also found were three Great Basin Stemmed points, suggesting that the site may have received at least some visitation during the Paleoarchaic Period. At the latest end of the prehistoric sequence are two Desert Side-notched projectile points.

There are four separate, dated component areas at 26HU1830, including two each of Middle Archaic and Late Archaic vintage. The most impressive with regard to both artifact and feature content is the Grid 2 Habitation Area, which includes the Grid 2 North and Feature 9-1 House Structure; the Grid 2 West Feature 2-1 and 2-2 Living Area; and the Grid 2 East Feature 2-3 Hearth Area. Moreover, this area appears to have been occupied for a narrow time frame within the Middle Archaic, around 3000 years ago based on a series of radiocarbon assays. The other Middle Archaic context is documented in deposits below 80 cm below surface in the Grid 3 exposure. It was recognized primarily on the basis of the stratigraphic positions of various diagnostic projectile points.

The most developed Late Archaic context at 26HU1830 was documented in the Grid 4 exposure, which also contained a series of eight ther-

TABLE 16
Artifact Inventory from 26HU1830

Type	Middle Archaic								Late Archaic A													
	Grid 2 North Feature 9-1	Grid 2 North	Grid 2 East Feature 2-3	Grid 2 East	Grid 2 West	Grid 2 Other	Grid 3 >80 cmbs	Subtotal	Grid 1	Grid 3 <80 cmbs	Grid 4 Feature 4-1	Grid 4 Feature 4-3.1	Grid 4 Feature 4-3.2	Grid 4 Feature 4-4	Grid 4 Feature 4-5	Grid 4 Feature 4-6	Grid 4 Feature 4-7	Grid 4 Feature 4-8	Grid 4 Other	Subtotal	Non-component	Total
Flaked stone																						
Projectile point	3	17	–	7	12	2	5	46	–	9	–	–	–	–	–	–	–	–	2	11	35	92
Biface	16	49	1	13	34	6	38	157	–	36	–	4	–	–	1	–	–	2	66	109	113	379
Drill	–	2	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	1	1	1	4
Formed flake tool	7	16	–	7	26	–	2	58	1	11	–	–	–	–	–	–	–	1	3	16	51	125
Flake tool	9	29	2	10	23	3	10	86	1	27	–	3	–	–	–	–	–	–	29	60	52	198
Cobble tool	–	–	–	–	2	–	–	2	–	–	–	–	–	–	–	–	–	–	1	1	1	4
Core tool	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	1	1	1	3
Core	–	–	–	–	4	1	1	6	–	4	–	–	–	–	–	–	–	–	5	9	29	44
Tested cobble	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Debitage	1939	6158	674	1847	5111	449	4600	20,778	165	12,356	–	1460	42	1	7	59	3	41	10,574	24,708	7541	53,027
Ground stone																						
Millingstone	–	2	–	3	2	1	–	8	–	–	–	–	–	–	–	–	–	–	1	1	17	26
Handstone	1	–	–	–	2	–	–	3	–	–	–	–	–	–	1	–	–	–	6	7	6	16
Mortar	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Anvil	1	–	–	–	4	–	–	5	–	–	–	–	–	–	–	–	–	–	–	–	–	5
Battered cobble	2	–	1	–	4	–	1	8	–	2	–	–	–	–	–	–	–	–	4	6	9	23
Miscellaneous ground stone	–	3	–	4	5	–	1	13	–	–	–	–	–	–	–	–	–	–	1	1	2	16
Miscellaneous prehistoric items																						
Bead, shell	–	9	–	–	–	–	–	9	–	–	–	–	–	–	–	–	–	–	–	–	1	10
Bead, bone	3	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Awl	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Game piece	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Modified bone	17	–	2	–	–	–	–	19	–	–	–	–	–	–	–	–	–	–	1	1	–	20
Faunal remains																						
Bone	3896	1978	1600	1750	1607	268	229	11,328	9	299	3	72	–	–	5	4	–	32	1244	1668	278	13,274
Shell	–	–	–	–	–	–	1	1	–	3	–	–	–	–	–	–	–	–	1	4	4	9
Total	5895	8263	2280	3641	6838	730	4888	32,535	176	12,747	3	1539	42	1	14	63	3	76	11,940	26,604	8143	67,282

mal features (see table 15). Radiocarbon dates cluster between 1340 and 1273 cal B.P., putting the formation of the component toward the early end of the Late Archaic. The remaining Late Archaic component was identified in the upper deposit—above 80 cm below surface—in the Grid 3 exposure, and dated to 1165 cal B.P. Because both Late Archaic areas date to the early end of the interval, which traditionally extends to 600 cal B.P., the materials from the Grid 3 and Grid 4 areas are designated Late Archaic A to acknowledge the narrow time frame of the occupations.

All remaining site contexts not included in the temporal components identified above are considered atemporal, and their respective materials are designated noncomponent (table 17).

Assemblage

A total of 67,282 archaeological items was recovered form 26HU1830, more than 98% of which was debitage and bone fragments. The assemblage includes the full complement of flaked stone tools (projectile points, bifaces, drills, flake tools, core tools, cobble tools, and cores), and processing tools (millingstones, handstones, one bowl mortar, anvils, battered cobbles, and miscellaneous ground stone). Other artifacts recovered were shell beads, modified bone and shell, and historic-era debris. The artifact inventory is arrayed by component in table 16, while the faunal remains are presented in table 21. Provided below is a more in-depth discussion of each artifact and ecofact class by component.

Middle Archaic Component: *Projectile Points*. A total of 46 projectile points were recovered from Middle Archaic contexts, more than half of which (n = 24) are Elko-series points (see table 17). Forty-three are fashioned from obsidian and three from CCS. Sixteen are complete or near-complete specimens, whereas the remainder are broken and represented by mostly proximal fragments. The CCS specimens are all proximal fragments.

Bifaces. A total of 157 bifaces was recovered from the two Middle Archaic components at the site (table 18). The majority of this tool class was fashioned from obsidian (56%), followed by CCS (41%), fine-grained volcanics (3%), and metasedimentary material (1%). The decreasing mean thickness of bifaces through the production stages indicates that both obsidian and CCS were subjected to a systematic reduction process culminating in finished tools. The obsidian bifaces are represented more by finished, Stage 5 pressure-flaked implements, whereas the CCS bifaces are more evenly divided among Stage 3 percussion and Stage 4 and Stage 5 pressure-flaked tools, suggesting that a greater range of CCS reduction occurred in these components.

The popularity of obsidian bifaces during this period in comparison to Late Archaic A toolstone material profiles (which is also observed in the debitage) suggests a much wider toolstone conveyance system associated with Middle Archaic populations. The nearest obsidian source is located ~20–25 km from the site, whereas a number of CCS source outcrops probably exist in much closer proximity to the site.

Formed Flake Tools. Formed flake tools exhibit purposefully modified (retouched) edges that are used for a variety of cutting, scraping, and chopping tasks associated with a variety of materials (e.g., wood, bone, hide, as well as roots, tubers, and other plant material). A total of 58 was recovered from Middle Archaic contexts (table 18); the majority (64%) have more than one utilized edge. Unlike bifaces, most of the tools in this class (83%) are fashioned from CCS, perhaps because this material is more durable for the intended uses described above; other materials recovered include obsidian (10%), and fine-grained volcanics (7%). As expected, they tend to made out of more robust cortical and interior flakes, as opposed to more gracile bifacial thinning flakes.

Flake Tools. A total of 86 simple flake tools was recovered from the two Middle Archaic components. These more expedient tools are identified by observable edge damage caused by use. Unlike formed flake tools, most (74%) have

TABLE 17
Projectile Point Assemblage from 26HU1830
CCS = cryptocrystalline silicate; cmbs = centimeters below surface FGV = fine-grained volcanic.

	Middle Archaic							Late Archaic A				
Projectile Point	Grid 2 North Feature 9-1	Grid 2 North	Grid 2 East	Grid 2 West	Grid 2 Other	Grid 3 >80 cmbs	Subtotal	Grid 3 <80 cmbs	Grid 4	Subtotal	Noncomponent	Total
Obsidian												
Great Basin Stemmed	–	1	–	–	–	–	1	–	–	–	1	2
Contracting Stem	–	–	–	–	–	–	–	–	–	–	1	1
Humboldt	–	–	–	–	–	–	–	–	–	–	5	5
Gatecliff	1	1	–	–	–	1	3	–	–	–	2	5
Elko	1	7	4	8	1	3	24	–	–	–	11	35
Lanceolate	–	1	–	–	–	–	1	–	–	–	–	1
Rosegate	–	–	–	2	–	–	2	3	2	5	3	10
Desert Side-notched	–	–	–	–	–	–	–	–	–	–	1	1
Indeterminate dart	–	–	–	–	–	–	–	–	–	–	2	2
Indeterminate arrow	–	–	–	–	–	–	–	–	–	–	1	1
Indeterminate	1	6	3	1	1	–	12	3	–	3	4	19
CCS												
Great Basin Stemmed	–	–	–	–	–	–	–	1	–	1	–	1
Humboldt	–	–	–	–	–	–	–	–	–	–	1	1
Elko	–	1	–	1	–	1	3	–	–	–	1	4
Rosegate	–	–	–	–	–	–	–	1	–	1	–	1
Desert Side-notched	–	–	–	–	–	–	–	–	–	–	1	1
Indeterminate arrow	–	–	–	–	–	–	–	1	–	1	–	1
FGV												
Humboldt	–	–	–	–	–	–	–	–	–	–	1	1
Total	3	17	7	12	2	5	46	9	2	11	35	92

only one utilized edge. There is a more equitable distribution of material types, which is led by CCS (59%) and followed by obsidian (34%) and fine-grained volcanics (6%). Interestingly, biface-thinning flakes comprise a large percentage of these tools forms (26%), whereas cortical flakes represent only 14% of this class. These data suggest that flake tools were used for more delicate cutting and scraping tasks in comparison to formed flake tools.

Other Flaked Stone Tools. A small number of other flaked stone artifacts was recovered, including cores, cobble cores, and a core tool (table 18). The cores include obsidian, CCS, and fine-grained volcanic specimens; most exhibit multidirectional flake scars, although a single CCS specimen had only unidirectional flake scarring. Two cobble tools were found, both fashioned from a fine-grained volcanic material; both are angular cobble blocks with evidence of use damage on at least one edge. The single core tool is also made of fine-grained volcanic material.

Debitage. A total of 53,027 unmodified flakes was recovered from the site (table 19). In Middle Archaic components, obsidian comprises 32% of this assemblage class, falling to 6% for the Late Archaic components. As noted above, to the extent that CCS is more available locally, this would indicate a major drop in the geographic extent of toolstone conveyance during the Late Archaic. A review of the technological flake categories contained in an analytical sample obtained from these two components suggests that while there was a shift to greater use of CCS during the Late Archaic, the reduction strategies used to process this local material did not substantially change.

Milling and Processing Equipment. Despite virtually equivalent cubic meters of hand excavation associated with Middle and Late Archaic components, a review of table 20 reveals a much higher density of milling and processing equipment (e.g., millingstones, handstones, one bowl mortar, anvil stones, and miscellaneous ground stone) in the Middle Archaic component.

The eight Middle Archaic millingstones are all too fragmentary to determine whether they are shaped, although two have a rough ovate shape in plan. Material types are eclectic and include felsite, sandstone, sedimentary rock, quartzite, and fine-grained volcanic material. One specimen exhibits bifacial use wear, but the remainder are unifacial. Also recovered was a slab of volcanic tuff with a small mortar indentation on its surface.

Three handstones were recovered, two whole specimens and one fragmentary. The whole specimens are manufactured from felsite and granite, and the fragmentary item from a sedimentary material. The whole specimens are both shaped, circular in plan and ovate in section; pecking was observed on both. The fragmentary item is ovate in section but of undetermined outline. Also recovered were a number of rock fragments with obvious grinding wear that were too fragmentary to classify; these were designated miscellaneous ground stone.

The Middle Archaic assemblage also includes an assortment of anvils and battered cobbles, the former absent from Late Archaic site contexts. The anvils exhibit heavily pecked zones on otherwise flat surfaces, which produces a small, amorphous indentation. They appear to be the result of pounding on a hard object, such as a core, as means to test or split the object. In this sense, they may be related to lithic production, as opposed to food processing. They are informal tools and exhibit little shaping or other modification. If their inferred function is correct, they may be paired with the battered cobbles recovered from the Middle Archaic component. These tools are fashioned mostly from fine-grained volcanic cobbles and exhibit pounding, crushing, and flaking damage along one or more edges.

Modified Bone and Shell. In addition to the shell beads previously discussed, a variety of modified animal bone was also recovered from Middle Archaic contexts (see table 14). Most of these are indeterminate fragments of mammal bone with small zones of polish. Also recovered were three bone bead tubes and an awl fragment. One of the tubes was fashioned from a jackrabbit long bone. The presence of shell and bone beads speaks to the habitation pose of the Grid 2 Habitation Area. Such items are mostly missing from the Late Archaic components.

Faunal Remains. A total of 11,328 bones and bone fragments was recovered from the two Middle Archaic components at the site, the vast majority from the Grid 2 Habitation Area. Fourteen separate taxa were recognized, along with a large number of indeterminate mammalian bone fragments, the latter divided into large (artiodactyl-size), medium (rabbit-size), and small (rodent-size) classes. The identifiable specimens include artiodactyls, represented mostly by mule deer, lagomorphs including jackrabbits and cottontails, and rodents, as well as a small number of carnivores, birds, lizards, snakes, and other reptiles; all data are presented by component in table 21.

The AI for the identifiable artiodactyl and rabbit remains for Middle Archaic component

TABLE 18
Flaked Stone Tool Inventory from 26HU1830
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic.

Type	Middle Archaic				Late Archaic A			Noncomponent					Total
	Obsidian	CCS	FGV	Metasedimentary	Obsidian	CCS	FGV	Obsidian	CCS	FGV	Greywacke	Rhyolite	
Biface													
Stage 1	–	–	–	–	–	2	–	1	6	–	–	–	9
Stage 2	5	7	–	–	–	4	–	4	15	–	–	–	35
Stage 3	5	17	–	–	3	14	–	4	17	1	–	–	61
Stage 4	22	17	2	1	1	41	–	6	14	–	–	1	105
Stage 5	46	18	2	–	6	28	–	28	7	–	–	–	135
Indeterminate stage	10	5	–	–	1	9	–	6	3	–	–	–	34
Subtotal	88	64	4	1	11	98	–	49	62	1	–	1	379
Drill													
Diamond bit cross section	–	1	–	–	–	1	–	–	–	–	–	–	2
Lenticular bit cross section	–	1	–	–	–	–	–	–	1	–	–	–	2
Subtotal	–	2	–	–	–	1	–	–	1	–	–	–	4
Formed flake tool													
Reworked biface blank	–	–	–	–	–	–	–	1	–	–	–	–	1
Biface-reduction flake blank	–	2	–	–	1	1	–	–	–	–	–	–	4
Interior flake blank	6	22	4	–	2	8	2	8	18	5	1	–	76
Cortical flake blank	–	18	–	–	–	–	–	2	11	1	–	–	32
Flake blank	–	1	–	–	–	–	–	–	1	–	–	–	2
Chunk blank	–	–	–	–	–	1	–	–	–	–	–	–	1
Tabular cobble blank	–	1	–	–	–	–	–	–	–	–	–	–	1
Indeterminate blank type	–	4	–	–	–	1	–	1	2	–	–	–	8
Subtotal	6	48	4	–	3	11	2	12	32	6	1	–	125
Average number of modified edges	1.7	2.1	1.5	–	1.3	1.6	2.0	1.7	2.2	2.2	2.0	–	2.0
Flake tool													
Biface-reduction flake blank	12	10	–	–	2	16	–	1	3	–	–	–	44
Interior flake blank	5	31	3	–	1	26	2	5	25	–	–	–	98

TABLE 18 (*Continued*)

Type	Middle Archaic				Late Archaic A			Noncomponent					Total
	Obsidian	CCS	FGV	Metasedimentary	Obsidian	CCS	FGV	Obsidian	CCS	FGV	Greywacke	Rhyolite	
Cortical flake blank	5	7	–	1	1	3	-	4	8	-	-	-	29
Flake blank	1	–	–	–	–	2	–	1	–	–	–	–	4
Indeterminate blank type	6	3	2	–	–	6	1	2	2	1	–	–	23
Subtotal	29	51	5	1	4	53	3	13	38	1	–	–	198
Average number of modified edges	1.3	1.2	1.4	1.0	1.5	1.4	2.0	1.4	1.4	1.0	–	–	1.4
Cobble tool													
Angular cobble blank	–	–	2	–	–	1	–	–	–	1	–	–	4
Subtotal	–	–	2	–	–	1	–	–	–	1	–	–	4
Core tool													
Globular cobble blank	–	–	1	–	–	–	–	–	–	–	–	–	1
Indeterminate blank type	–	–	–	–	–	1	–	1	–	–	–	–	2
Subtotal	–	–	1	–	–	1	–	1	–	–	–	–	3
Core													
Multidirectional	1	1	3	–	–	5	–	–	18	5	–	1	34
Unidirectional	–	1	–	–	–	3	–	1	2	–	–	–	7
Bipolar	–	–	–	–	–	1	–	1	–	–	–	–	2
Indeterminate form	–	–	–	–	–	–	–	–	1	–	–	–	1
Subtotal	1	2	3	–	–	9	–	2	21	5	–	1	44
Tested cobble													
Globular cobble blank	–	–	–	–	–	–	–	–	1	–	–	–	1
Subtotal	–	–	–	–	–	–	–	–	1	–	–	–	1
Total	124	167	19	2	18	174	5	77	155	14	1	2	758

TABLE 19
Debitage Analysis from 26HU1830
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic; Indet. = indeterminate.

Debitage	Middle Archaic					Late Archaic A					Noncomponent					Total
	Obsidian	CCS	FGV	Quartzite	Indet.	Obsidian	CCS	FGV	Quartzite	Indet.	Obsidian	CCS	FGV	Quartzite	Indet.	
Diagnostic																
Core reduction	3	12	–	–	–	–	13	2	–	–	1	13	–	–	–	44
Core reduction/ flake tool production	2	4	–	–	–	2	9	–	–	–	1	4	1	–	–	23
Biface production	25	58	–	–	–	8	94	–	–	1	13	50	–	1	–	250
Tool finishing/ resharpening	13	5	–	–	–	1	10	–	–	–	6	23	–	–	–	58
Nondiagnostic																
General percussion	119	167	3	–	–	16	321	–	1	–	15	130	3	–	–	775
Indeterminate type	130	280	6	–	–	30	566	1	5	1	29	188	1	–	–	1237
Not analyzed	6387	13,290	228	45	1	1545	21,920	69	92	1	1534	5463	58	6	1	50,640
Total	6679	13,816	237	45	1	1602	22,933	72	98	3	1599	5871	63	7	1	53,027

TABLE 20
Ground Stone Tool Inventory from 26HU1830

Type	Middle Archaic								Late Archaic A				Noncomponent						Total
	Grinding	Pecking	Pounding	Crushing	Flaking	Grinding and Pounding	Flaking and Micro-flaking	Indeterminate Wear	Grinding	Pecking	Flaking	Grinding, Pecking, and Flaking	Grinding	Pecking	Pounding	Flaking	Grinding and Pounding	Indeterminate Wear	
Millingstone																			
One-use wear surface	7	–	–	–	–	–	–	–	1	–	–	–	17	–	–	–	–	–	25
Two-use wear surfaces	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1
Subtotal	7	–	–	–	–	1	–	–	1	–	–	–	17	–	–	–	–	–	26
Handstone																			
One-use wear surface	1	–	–	–	–	–	–	–	2	–	–	–	4	–	–	–	–	–	7
Two-use wear surfaces	2	–	–	–	–	–	–	–	1	–	–	–	2	–	–	–	–	–	5
Three-use wear surfaces	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1
Subtotal	3	–	–	–	–	–	–	–	3	–	–	1	6	–	–	–	–	–	13
Mortar																			
One-use wear surface	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Subtotal	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Anvil																			
One-use wear surface	–	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5
Subtotal	–	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5
Battered cobble																			
One-use wear surface	–	–	–	–	5	–	–	–	–	1	1	–	–	2	–	3	–	–	12
Two-use wear surfaces	–	–	1	–	–	–	1	–	–	–	2	–	–	–	–	1	–	–	5
Four-use wear surfaces	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1
Indeterminate number of wear surfaces	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	3
Subtotal	–	–	2	–	5	–	1	–	–	1	3	–	–	2	2	4	–	1	21
Miscellaneous ground stone																			
One-use wear surface	9	1	–	1	–	–	–	–	1	–	–	–	1	–	–	–	–	–	13
Two-use wear surfaces	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Indeterminate number of wear surfaces	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
Subtotal	9	1	–	1	–	–	–	1	1	–	–	–	1	–	–	–	1	–	15
Total	20	6	2	1	5	1	1	1	5	1	3	1	24	2	2	4	1	1	81

TABLE 21
Faunal Remains from 26HU1830

Common Name	Taxon	Middle Archaic		Late Archaic A		Noncomponent		Total	
		Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
Bird									
Bird, perching	Passeriformes	1	0.01	6	0.17	–	–	7	0.18
Bird, indeterminate	Aves, indeterminate	4	0.43	1	0.66	–	–	5	1.09
Mammal									
Deer, mule	*Odocoileus hemionus*	52	168.82	1	1.86	–	–	53	170.68
Artiodactyl, indeterminate	*Artiodactyla*, Indeterminate	186	88.08	22	4.58	21	4.82	229	97.48
Coyote	*Canis latrans*	12	23.12	–	–	–	–	12	23.12
Carnivore, indeterminate	*Carnivora*, Indeterminate	22	2.95	–	–	6	3.64	28	6.59
Hare, black-tailed	*Lepus californicus*	407	84.40	94	16.33	9	1.27	510	102.00
Rabbit, cottontail	*Sylvilagus* spp.	–	–	–	–	1	0.17	1	0.17
Hare/rabbit	Leporidae	88	3.57	24	0.83	2	0.11	114	4.51
Mouse, deer	*Peromyscus* spp.	–	–	1	0.03	–	–	1	0.03
Mouse, Western harvest	*Reithrodontomys megalotis*	–	–	2	0.04	–	–	2	0.04
Pocket gopher, Bottae's	*Thomomys bottae*	–	–	12	3.14	–	–	12	3.14
Rat, kangaroo	*Dipodomys* spp.	5	0.14	67	2.26	–	–	72	2.40
Squirrel/chipmunk	Sciuridae	84	4.59	53	2.31	17	0.36	154	7.26
Woodrat	*Neotoma* spp.	1	0.23	–	–	–	–	1	0.23
Rodent, indeterminate	Rodentia, indeterminate	49	0.75	133	2.07	8	0.09	190	2.91
Mammal, large	Mammalia, large	3112	1010.92	132	30.27	86	33.67	3330	1074.86
Mammal, medium	Mammalia, medium	1408	163.89	284	19.70	10	1.41	1702	185.00
Mammal, small	Mammalia, small	411	16.44	101	1.84	16	0.52	528	18.80
Mammal, indeterminate	Mammalia, indeterminate	5441	213.55	597	13.97	98	4.32	6136	231.84
Reptile									
Iguana	*Iguana* spp.	–	–	1	0.01	–	–	1	0.01
Lizard, horned	*Phrynosoma* spp.	21	0.36	57	0.95	2	0.04	80	1.35
Lizard	Lacertilia	14	0.16	49	0.48	1	0.01	64	0.65
Snake, coachwhip/whipsnake	*Masticophis* spp.	9	0.16	–	–	–	–	9	0.16
Snake, nonvenomous	Colubridae	1	0.01	27	0.60	–	–	28	0.61
Snake, venomous	Viperidae	–	–	1	0.02	–	–	1	0.02
Snake	Serpentes	–	–	–	–	1	0.01	1	0.01
Reptile, indeterminate	Reptilia, indeterminate	–	–	3	0.01	–	–	3	0.01
Total		11,328	1782.58	1668	102.13	278	50.44	13,274	1935.15

areas at this site is 0.32, whereas the AI for identifiable Late Archaic components is 0.16. The AI for the Middle Archaic large- and middle-sized mammalian bone elements is 0.69, while the Late Archaic AI for these same size classes is 0.34. In sum, there is a strong indication that large-game procurement was comparatively more important during the Middle Archaic Period than the Late Archaic. The implications of this pattern are more fully addressed in Research Synthesis section of this report.

Late Archaic A Component: *Projectile Points*. A total of 11 projectile points were recovered from Late Archaic A contexts, most of them Rosegate variants (see table 17). Eight are made of obsidian and three from CCS. Five are complete or near-complete specimens, and the remainder are mostly proximal fragments. The small sample of CCS specimens are mostly fragmentary: they include both medial and proximal fragments, as well as one complete specimen.

Bifaces. A total of 109 bifaces was recovered from the two Late Archaic components at the site (see table 18). The majority of this tool class was fashioned from CCS (90%), followed by obsidian CCS (10%). Noteworthy is the decrease in the use of obsidian for biface production during the Late Archaic: from 56% during the Middle Archaic to 10% in Late Archaic components. To the extent that CCS is more available locally, this would indicate a major fall-off in the geographic extent of toolstone conveyance during the Late Archaic.

There is also a complete range of reduction stages represented in the CCS bifaces dating to this period, again suggestive of more local toolstone acquisition and production. In contrast, most Late Archaic obsidian bifaces are finished Stage 5 implements perhaps transported to the site from more distant locations.

Formed Flake Tools. Noteworthy perhaps is the more limited representation of Late Archaic formed flake tools in comparison to their Middle Archaic counterparts; just 16 such tools were recovered from Late Archaic contexts (see table 18). This suggests a reduction in the heavy-duty cutting, scraping, and chopping tasks associated with these tools during this period. Most (69%) have multiple zones of edge modification. Material preferences still favor CCS (69%), although this is less dramatic than Middle Archaic formed flake tools. Interestingly, cortical flakes are not represented, again suggesting less of a reliance on heavy-duty processing tasks.

Flake Tools. A total of 60 flake tools was recovered from Late Archaic contexts; most (63%) exhibit one utilized edge. Perhaps mirroring a broader trend for CCS toolstone in general, most Late Archaic flake tools are fashioned from CCS (88%), followed by much smaller amounts of obsidian (4%) and fine-grained volcanics (3%). The CCS tools are dominated by interior flakes and biface-thinning flakes.

Other Flaked Stone Tools. A small number of other flaked stone artifacts were recovered, including nine cores, a cobble core, and a core tool (see table 18). The cores are entirely made of CCS and most exhibit multidirectional flake scars, although several specimens have unidirectional flake scarring and a single specimens exhibited evidence of bipolar reduction. The cobble core and core tool are also fashioned from CCS, the former is made from an angular cobble blank, the latter from an indeterminate blank type.

Debitage. As previously discussed, the Late Archaic witnessed a significant shift toward the use of more locally available CCS, and away from obsidian. Obsidian accounts for just 6% of Late Archaic debitage (see table 20). Flaked stone reduction technologies associated with CCS, however, do not appear to have substantially changed, as the representation of major flake-type categories varies little between the Middle and Late Archaic periods (see table 20).

Milling and Processing Equipment. As previously reviewed, a range of milling and processing tools were recovered in Late Archaic contexts, but generally at much lower frequency (see table 19). Thus, only one millingstone was found, an unshaped, thin slab fashioned from sandstone with unifacial use wear. Four handstones were documented, three assembled from multiple refitted fragments; quartzite is the dominate material. Most are elliptical in plan, and ovate to elongate in cross section. Finally, six battered cobbles were found, three whole specimens and three fragments. These tools are fashioned from fine-grained volcanic, CCS, and felsite cobbles, and exhibit pounding, crushing, and flaking damage along one or more edges.

Faunal Remains. A total of 1668 bones and bone fragments was recovered from the two Late Archaic components at the site, most from the Grid 4 Midden Feature Area (see table 21). The overall representation of taxa do not differ substantially from Middle Archaic components, although as we have previously noted there appears to be a diminished reliance on large-game procurement during the Late Archaic. Whereas the Middle Archaic AI for identifiable artiodactyl and rabbit remains from Middle Archaic components is 0.32, this value falls to 0.16 during the Late Archaic. The AI for the Middle Archaic large- and middle-sized mammalian bone elements is 0.69, while the Late Archaic AI for these same size classes is 0.34. The implications of this pattern are more fully address in Research Synthesis section of this report.

Noncomponent Areas: A sizeable assemblage of materials from undated site contexts was recovered from 26HU1830. These items are tabulated in the artifact summary and analytical tables presented in this discussion; more detailed analytical results are available in McGuire et al. (2017).

Site Summary

A review of the 73 time-sensitive projectile points recovered from 26HU1830 reveals that the site has sustained some visitation throughout the Holocene, the exception being the Post-Mazama Period, as no Northern Side-notched points were documented. Conversely, the dominant periods of occupation based on these time markers are the Middle and Late Archaic A periods.

More to the point, however, are the proximal positions of substantial Middle and Late Archaic components at 26HU1830 that allow us to compare prehistoric habitation and land use across these time periods. There are two spatially distinct Middle Archaic components at the site, the first and most complex encompasses virtually all of the Grid 2 Area, the second is situated in stratigraphically inferior deposits in the Grid 3 Midden Area. Late Archaic components include all of the Grid 4 Midden Feature Area and the upper midden deposits in Grid 3.

The Grid 2 Middle Archaic component is replete with a house structure (Feature 9-1) and associated external living area (Feature 2-1 and 2-2 Living Area, and adjacent hearth Feature 2-3 Hearth Area). The house structure appears to have been cut into the underlying sterile deposit and is reminiscent of other Great Basin Middle Archaic domiciles in that it is both comparatively large and complex; it contains numerous postholes, rock concentrations and zones of soil oxidation, as well as an assortment of artifactual material and faunal bone debris. Two radiocarbon dates from Feature 9-1 clearly place its use at about 3000 years ago, i.e., at the early end of the Middle Archaic Period. Both the Feature 2-1 and 2-2 Living Area and Feature 2-3 Hearth Area are situated within several meters of the house structure and appear to be elements of the same habitation complex; both share statistically identical radiocarbon dates with the house structure. By contrast, the Middle Archaic midden deposit in Grid 3 is bereft of features but does exhibit a relatively low-density accumulation of mostly artifacts and faunal remains.

The habitation pose of the Middle Archaic components gives way in Late Archaic times to an archaeological record characterized more by processing features, as represented by a series of thermal features observed in the dune matrix of the Grid 4 exposure. These features generally contain a discrete zone of charcoal and/or fire-affected rock, usually with small amounts of debitage and bone. The exception is Feature 4-3.1, which contained an abundance of CCS flaked stone artifacts and debitage. Although suggestive of a heat-treated feature, no such evidence of thermal modification was observed on flaked stone materials from this context. At Grid 4, these features were in use over a relatively thin slice of time between 1340 and 1165 cal B.P. Late Archaic deposits were also identified in the upper stratigraphic levels of Grid 3, but in this case absent the processing features.

As with many habitation contexts within the project area, dune deposits appear to have been attractive to prehistoric populations. The accumulation of these sands, as evidenced by the depths of cultural deposits and features, may have aided in their preservation. In sum, the Grid 2 Middle Archaic feature complex appears to represent contemporaneous residential habitations, whereas the Late Archaic occupation appears more multivariate, ranging from near-contemporaneous, intensive processing activities, as represented by the Grid 4 feature inventory, to more generalized habitation that produced no features (see Grid 3).

Perhaps the most dramatic aspect of the assemblage at 26HU1830 is the change in toolstone material types, with the Middle Archaic use of obsidian yielding to CCS in the Late Archaic. This isn't just a matter of degree but a wholesale change, with obsidian comprising 32% of Middle Archaic debitage, but falling to just 6% during the Late Archaic. This pattern holds through a variety of tool classes. To the extent that obsidian is of exotic origin, whereas CCS is considered more locally obtainable, these data indicate a much more extensive land-use system during the Middle Archaic that included forays to distant obsidian sources. This pattern is confirmed to some extent by observing the stage representation in Middle Archaic bifaces, where most obsidian forms are complete or near-complete Stage 4 and Stage 5 implements (see table 18). By contrast, the CCS bifaces dating to this time are represented by a wider range of production stages suggesting on-site tool production from locally available material.

We also see a greater use of formed flake tools during the Middle Archaic in relation to simple flake tools. These tools appear to have been used for more robust processing tasks, as they are often fashioned from large cortical flakes and have multiple zones of edge wear. Their greater representation in Middle Archaic components at 26HU1830 may be tied to longer-term habitation that may have included not only an array of food processing tasks, but also domestic woodworking activities.

Also striking is the much higher density of milling and processing equipment observed in the Middle Archaic components. While plant gathering and processing probably played important roles in both Middle and Late Archaic occupation of the site, we suspect the greater density of these tools in Middle Archaic components relates to longer term habitation and domestic use during this time, as opposed to shorter-term, specialized processing activities characterizing Late Archaic occupation.

Finally, there also appears to have been a subsistence shift with regard to Middle versus Late Archaic hunting patterns at the site, with the former showing a much stronger proclivity for the taking of large game. The pattern holds for both identifiable faunal remains, and those classified only to size category. A strong Middle Archaic focus on large game procurement has been observed elsewhere in the Great Basin and is further discussed in the Synthesis section of this volume.

26HU1876 SITE REPORT

Site 26HU1876 is a sprawling multicomponent site located within and adjacent to the Sulphur Springs airstrip. It is nearly one kilometer across, both north to south and east to west (figs. 23, 24), and was originally described as a "temporary camp location and processing area that contains both ground and flaked stone tools, flakes, and several possible deflated hearth locations" (Kautz, 2010). One primary locus was identified in the central-eastern portion of the site. Locus 1 (subsequently referred to here as the Grid 1 Area) is the focus of the current data-

FIGURE 23. 26HU1876 site and Locus B overview.

recovery effort. As originally recorded, it measures 200 m (N-S) × 120 m (E-W) and contained an estimated 500 flakes, along with projectile points, bifaces, millingstones, and seven fire-affected rock concentrations.

The site is situated at the edge of the Black Rock playa resting on the low-gradient alluvial fan and aeolian sand sheet west of the high dune forms of the Sulphur Springs dune field. Local features include a series of small sand hummocks, surface gravels, and deflation zones. Vegetation across the site is sparse, consisting of greasewood, saltbush, rabbitbrush, halegeton, and tumble mustard. Much of the site's original landscape has been altered by grading associated with construction of the airstrip, and by other historic-era and modern activities, although portions of the site remain substantially unmodified.

Field Methods

Work at 26HU1876 included an initial surface reconnaissance and artifact collection that included confirmation of various loci and surface concentrations of fire-affected rock noted on previous site records. As indicated above, the effort quickly focused on the Locus 1, Grid 1 Area. Initial testing of the area was informed by surface concentrations of fire-affected rock. One such concentration, Feature 12, was subject to initial test excavation (Test Unit 1). The unit revealed artifact-bearing, charcoal-stained deposits (midden) at depth and was subsequently expanded by the addition of a series of contiguous 1 × 1 m control units into the Grid 1 block exposure. The exposure is roughly rectangular in shape and measures 10 to 12 m long and 7 to 9 m wide (fig. 24, Detail Map 1). Thir-

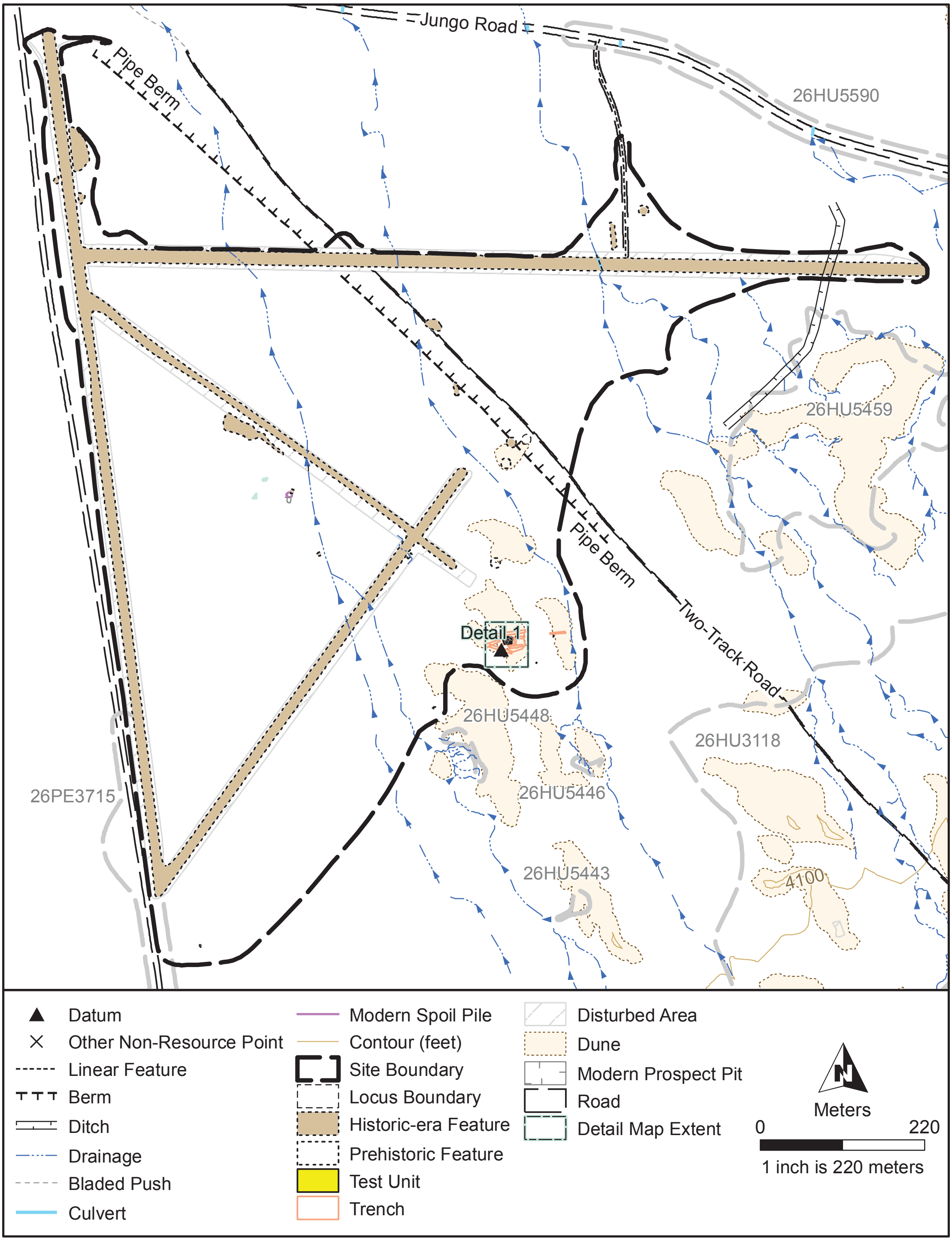


FIGURE 24. 26HU1876 sketch map.

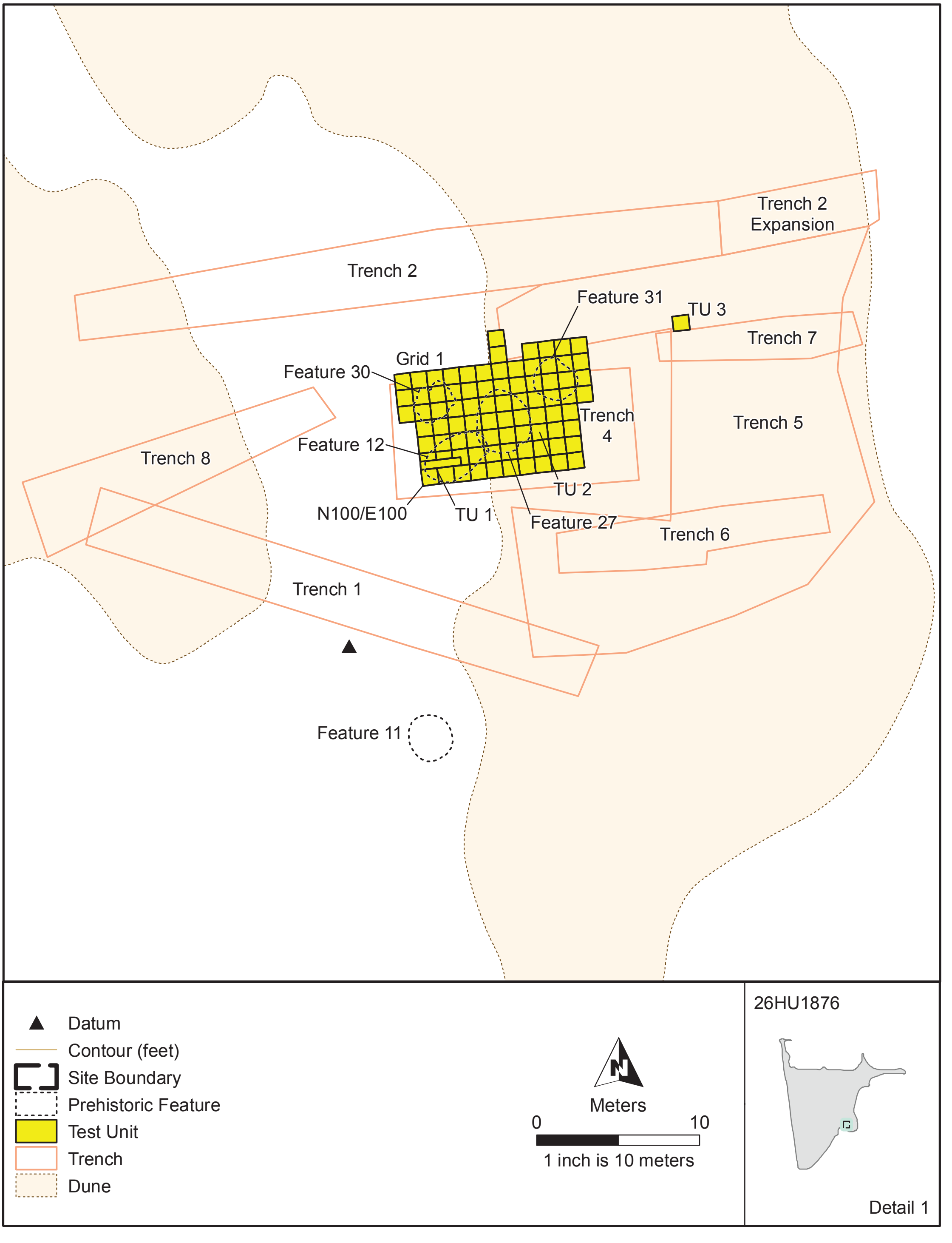


FIGURE 24 (*continued*). 26HU1876 sketch map, Detail 1.

teen features and subfeatures were identified in the Grid 1 exposure (see Grid 1 Area). Generally, these were excavated as separate analytical units and their contents reported separately. A total of 83 m^2 of block exposure was hand-excavated at Grid 1 representing about 63 m^3 of deposit (table 22).

Use of mechanical excavation (front-loaders and backhoes) was also employed in the Grid 1 vicinity. Six backhoe trenches were excavated (see fig. 24), mostly as a geomorphological assessment of the area, but also as a test for buried cultural deposits. Also, portions of the dune surface to the east of Grid 1, including the eastern half of Grid 1, were removed to facilitate the excavation of underlying cultural deposits.

Site Structure and Chronology

As previously discussed, while the site is extensive, virtually all the data recovery directed at prehistoric components was confined to Grid 1. The exception to this includes a smattering of surface artifacts recovered from the site, including four projectile points (two Elko series, one Cottonwood, and one Small-stemmed), nine bifaces, one formed flake tool and one millingstone. The following discussion is directed at the structure and chronology of the Grid 1 exposure and associated backhoe trenching activity.

Grid 1 Area: Representative stratigraphy and soils for Grid 1 are described for Trench 2 (figs. 25, 26). For the most part, the three-stratum aeolian sequence observed throughout the dune field is present in the local stratigraphic profile.

The profile of Trench 2 is approximately 50 m long and oriented east-west across two dune crests separated by a lower interdune area. The trench exposes thick aeolian deposits (Strata III and II) on its east and west ends; these strata thin toward the center of the trench where aeolian Stratum II transitions into cemented playette (lacustrine) sediment above a fluvial deposit (Stratum I). Stratum I, likely underlying much of the site area, and certainly the archaeological deposit surrounding Grid 1, shows a well-developed paleosol marked by reddened and cemented Btk horizons. The extreme hardness of cemented nodules in the Btkb2 horizon of Stratum I suggests cementation by calcium carbonate and silica. Stratum I likely predates most of the Holocene aeolian activity in the Sulphur Springs dune field.

The archaeological assemblage at Grid 1 is confined to Strata II and III. These aeolian strata thicken toward the dune crests; Grid 1 occupies the windward side of the eastern dune crest at Trench 2. Stratum II shows a weak to moderate Bwkb1 soil profile that changes little across the area of Grid 1. The soil shows that the dune was stable for a period of time, probably in the late Holocene. When local aeolian activity resumed, winds removed the surface of Stratum II, removing its A horizon during minor scouring. The capping aeolian deposit, certainly late Holocene to modern in age, is similar to the underlying dune and sandsheet deposit, reaching 50 cm in depth in places. This late deposit shows a weakly developed A-Ck soil horizon at the modern surface.

The Grid 1 exposure is dominated by a series of house structures and features (fig. 27), all radiocarbon dated to a narrow time frame in the Late Archaic Period (table 23). This is corroborated by projectile point profile from the exposure (table 24); 14 of the 18 points recovered are Rosegate series variants. A smattering of older (Northern Side-notched) and later-dating forms (Desert Side-notched) suggests at least some site visitation before and after the primary occupation. The structural and temporal characteristics of each feature is reviewed below.

Features: *Feature 30, House Structure*. This circular zone of soil discoloration, measuring 2.36 m (N-S) × 2.54 m (E-W), was identified 50–60 cm below the prepared excavation surface, and from 84 to 126 cm below the original ground surface (i.e., before mechanical scraping), in the northwestern zone of the Grid 1 exposure (figs. 28–30). The floor zone is a shallow basin in profile and ranges from 15 cm thick at its center to about 5 cm at its margins

TABLE 22
Excavation Summary for 26HU1876

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Late Archaic B (m^3)
1	Nonlocus	Grid 1 N101/E100	0.5 × 2.5	0.44
2	Nonlocus	Grid 1 N102/E107	1 × 1	1.23
3	Nonlocus	–	1 × 1	0.96
N100/E100	Nonlocus	Grid 1	1 × 1	0.33
N100/E101	Nonlocus	Grid 1	1 × 1	0.44
N100/E102	Nonlocus	Grid 1	1 × 1	0.79
N100/E103	Nonlocus	Grid 1	1 × 1	0.87
N100/E104	Nonlocus	Grid 1	1 × 1	0.94
N100/E105	Nonlocus	Grid 1	1 × 1	1.03
N100/E106	Nonlocus	Grid 1	1 × 1	0.89
N100/E107	Nonlocus	Grid 1	1 × 1	0.90
N100/E108	Nonlocus	Grid 1	1 × 1	0.87
N100/E109	Nonlocus	Grid 1	1 × 1	0.68
N101/E100	Nonlocus	Grid 1	0.5 × 1/1 × 1	0.53
N101/E101	Nonlocus	Grid 1	0.5 × 1/1 × 1	0.51
N101/E102	Nonlocus	Grid 1	0.75 × 1/1 × 1	0.86
N101/E103	Nonlocus	Grid 1	1 × 1	0.97
N101/E104	Nonlocus	Grid 1	1 × 1	0.85
N101/E105	Nonlocus	Grid 1	1 × 1	1.07
N101/E106	Nonlocus	Grid 1	1 × 1	0.90
N101/E107	Nonlocus	Grid 1	1 × 1	0.77
N101/E108	Nonlocus	Grid 1	1 × 1	0.67
N101/E109	Nonlocus	Grid 1	1 × 1	0.67
N102/E100	Nonlocus	Grid 1	1 × 1	0.72
N102/E101	Nonlocus	Grid 1	1 × 1	0.70
N102/E102	Nonlocus	Grid 1	1 × 1	1.20
N102/E103	Nonlocus	Grid 1	1 × 1	1.11
N102/E104	Nonlocus	Grid 1	1 × 1	0.98
N102/E105	Nonlocus	Grid 1	1 × 1	1.03
N102/E106	Nonlocus	Grid 1	1 × 1	0.91
N102/E108	Nonlocus	Grid 1	1 × 1	0.71
N102/E109	Nonlocus	Grid 1	1 × 1	0.66
N103/E100	Nonlocus	Grid 1	1 × 1	0.86
N103/E101	Nonlocus	Grid 1	1 × 1	0.68
N103/E102	Nonlocus	Grid 1	1 × 1	0.81
N103/E103	Nonlocus	Grid 1	1 × 1	0.88
N103/E104	Nonlocus	Grid 1	1 × 1	0.95
N103/E105	Nonlocus	Grid 1	1 × 1	0.97

TABLE 22 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Late Archaic B (m^3)
N103/E106	Nonlocus	Grid 1	1 × 1	0.83
N103/E107	Nonlocus	Grid 1	1 × 1	0.72
N103/E108	Nonlocus	Grid 1	1 × 1	0.63
N103/E109	Nonlocus	Grid 1	1 × 1	0.65
N104/E099	Nonlocus	Grid 1	1 × 1	0.74
N104/E100	Nonlocus	Grid 1	1 × 1	0.93
N104/E101	Nonlocus	Grid 1	1 × 1	0.86
N104/E102	Nonlocus	Grid 1	1 × 1	1.00
N104/E103	Nonlocus	Grid 1	1 × 1	0.96
N104/E104	Nonlocus	Grid 1	1 × 1	1.08
N104/E105	Nonlocus	Grid 1	1 × 1	1.05
N104/E106	Nonlocus	Grid 1	1 × 1	0.77
N104/E107	Nonlocus	Grid 1	1 × 1	0.70
N104/E108	Nonlocus	Grid 1	1 × 1	0.64
N104/E109	Nonlocus	Grid 1	1 × 1	0.65
N104/E110	Nonlocus	Grid 1	1 × 1	0.49
N105/E099	Nonlocus	Grid 1	1 × 1	0.80
N105/E100	Nonlocus	Grid 1	1 × 1	0.90
N105/E101	Nonlocus	Grid 1	1 × 1	0.88
N105/E102	Nonlocus	Grid 1	1 × 1	0.85
N105/E103	Nonlocus	Grid 1	1 × 1	0.83
N105/E104	Nonlocus	Grid 1	1 × 1	0.90
N105/E105	Nonlocus	Grid 1	1 × 1	0.98
N105/E106	Nonlocus	Grid 1	1 × 1	0.62
N105/E107	Nonlocus	Grid 1	1 × 1	0.66
N105/E108	Nonlocus	Grid 1	1 × 1	0.48
N105/E109	Nonlocus	Grid 1	1 × 1	0.45
N105/E110	Nonlocus	Grid 1	1 × 1	0.39
N106/E099	Nonlocus	Grid 1	1 × 1	0.50
N106/E100	Nonlocus	Grid 1	1 × 1	0.69
N106/E101	Nonlocus	Grid 1	1 × 1	0.76
N106/E102	Nonlocus	Grid 1	1 × 1	0.75
N106/E103	Nonlocus	Grid 1	1 × 1	0.58
N106/E104	Nonlocus	Grid 1	1 × 1	0.65
N106/E105	Nonlocus	Grid 1	1 × 1	0.57
N106/E106	Nonlocus	Grid 1	1 × 1	0.61
N106/E107	Nonlocus	Grid 1	1 × 1	0.46
N106/E108	Nonlocus	Grid 1	1 × 1	0.47
N106/E109	Nonlocus	Grid 1	1 × 1	0.44

TABLE 22 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Late Archaic B (m^3)
N106/E110	Nonlocus	Grid 1	1 × 1	0.46
N107/E105	Nonlocus	Grid 1	1 × 1	0.51
N107/E107	Nonlocus	Grid 1	1 × 1	0.45
N107/E108	Nonlocus	Grid 1	1 × 1	0.74
N107/E109	Nonlocus	Grid 1	1 × 1	0.49
N107/E110	Nonlocus	Grid 1	1 × 1	0.76
N108/E105	Nonlocus	Grid 1	1 × 1	0.53
Total				63.19

(fig. 29). The floor is recognized by dark soil staining, fire-affected rock, and increased charcoal flecks, and it terminates on sterile compacted silt-sands. Reddish, oxidized soils were observed near the center of the feature. Charcoal staining and artifact densities were highest in the eastern portions of the feature.

Four distinct subfeatures, 29, 30.1, 30.2, and 30.3, were identified in the floor zone of the house structure (fig. 27). Subfeature 29 is a circular, basin-shaped pit measuring 40 × 45 cm in diameter and 14 cm deep. It was described by the field excavation team as a hearth/clean-out dump. Subfeature 30.1 is also a basin-shaped pit; it is situated slightly below portions of Subfeature 29, and is potentially part of the same construction. It measures 67 × 71 cm with a maximum depth of 28 cm. Subfeature 30.2 is a smaller, circular, basin-shaped pit, measuring 23 × 26 cm, with 5 cm of vertical extension. Filled with dark gray, charcoal-stained deposit, the field excavation team characterized this feature as a smudge pit. Subfeature 30.3 is also a smaller, circular, basin-shaped pit, measuring 22 × 34 cm in diameter and 6 cm thick.

Three radiocarbon dates, all reflective of Late Archaic occupation, are associated with the Feature 30 house structure: calibrated median probability dates of 941, 856, and 860 cal B.P. (see table 24), were obtained from subfeatures 29, 30, and 30.1, respectively. Artifacts associated with the structure include an unusually large number of millingstones, along with an assortment of flaked stone tools and debitage (table 25).

Feature 31, House Structure. This roughly circular house floor, measuring 2.37 m (N-S) × 2.55 m (E-W), was first identified 40–60 cm below the prepared surface of units 104N/107–109E (see fig. 27). The floor zone is a shallow basin in profile and ranges from 4 to 14 cm thick. The floor is recognized by dark soil staining, fire-affected rock, and increased charcoal and carbonate flecks, and terminates on sterile compacted silt-sands. The staining is most evident in the southeastern portion of the feature. Three subfeatures (31.1 through 31.3) were subsequently identified in this area (fig. 27).

Subfeature 31.1 measures 56 × 33 cm and approximately 17 cm deep; Subfeature 31.2 measures 43 × 35 cm, and cuts into the floor to a depth of 16 cm. Subfeature 31.3 is more irregular and extends across an area measuring 75 × 50 cm. The function of these subfeatures is not clearly indicated, although they appear to be hearths and/or processing features of some kind.

Median probability dates of 913 and 985 cal B.P. were obtained from Feature 31, and Subfeature 31.1, respectively (table 23). In addition, two Rosegate series projectile point were recovered, anchoring the structure firmly in the Late Archaic Period. Other items recovered from the feature include several bifaces, seven flake tools, one core, ochre, and one ground stone fragment, as well as a large quantity of debitage and faunal bone (table 25).

Feature 12. This feature was originally identified as a surface concentration of fire-affected

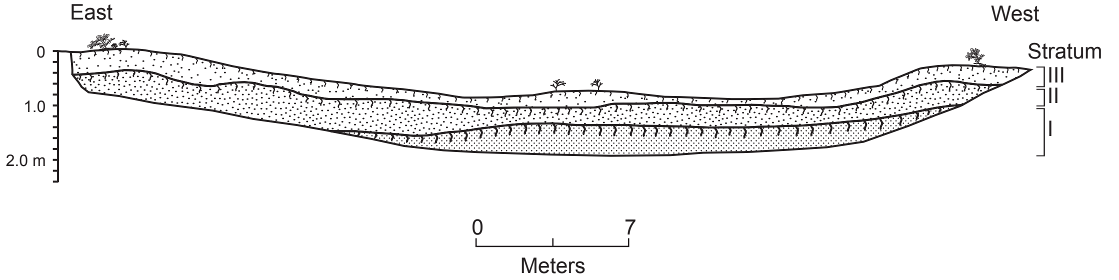


FIGURE 25. 26HU1876 schematic cross section of Trench 2 profile. Based on original illustration courtesy of Thomas F. Bullard.

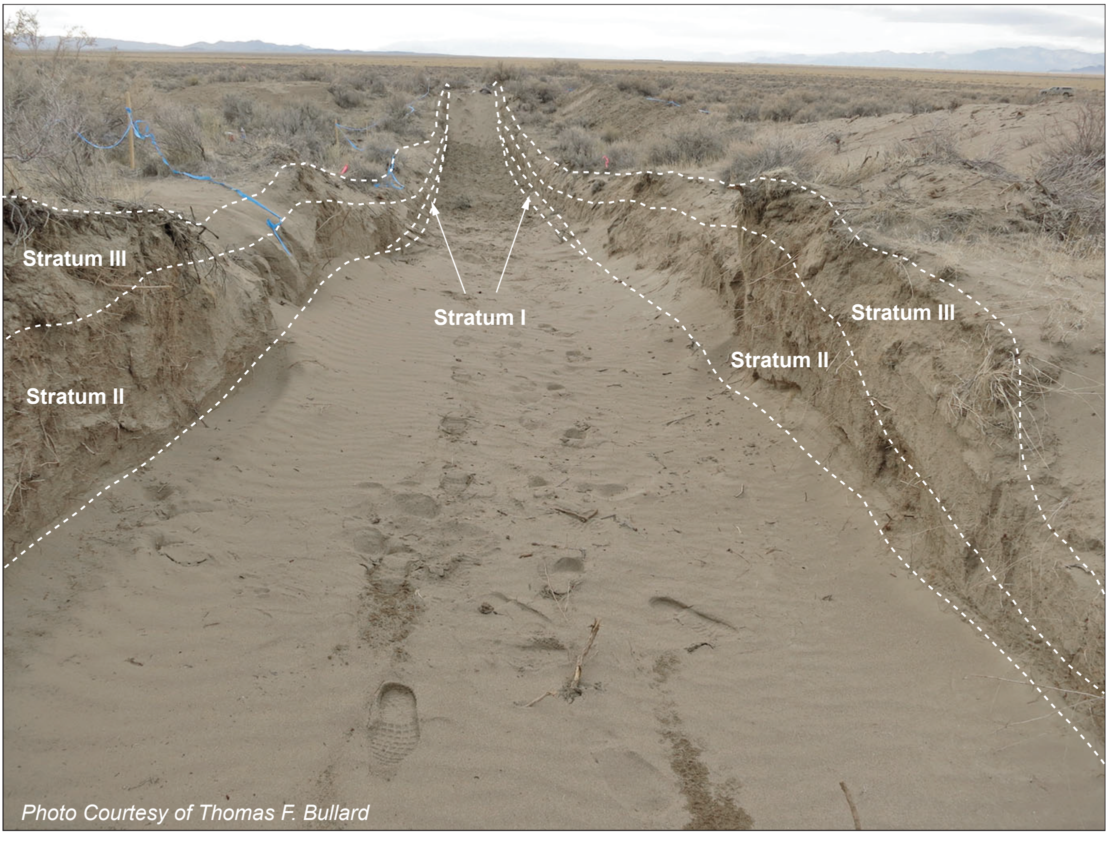


FIGURE 26. 26HU1876 photographic cross section of Trench 2.

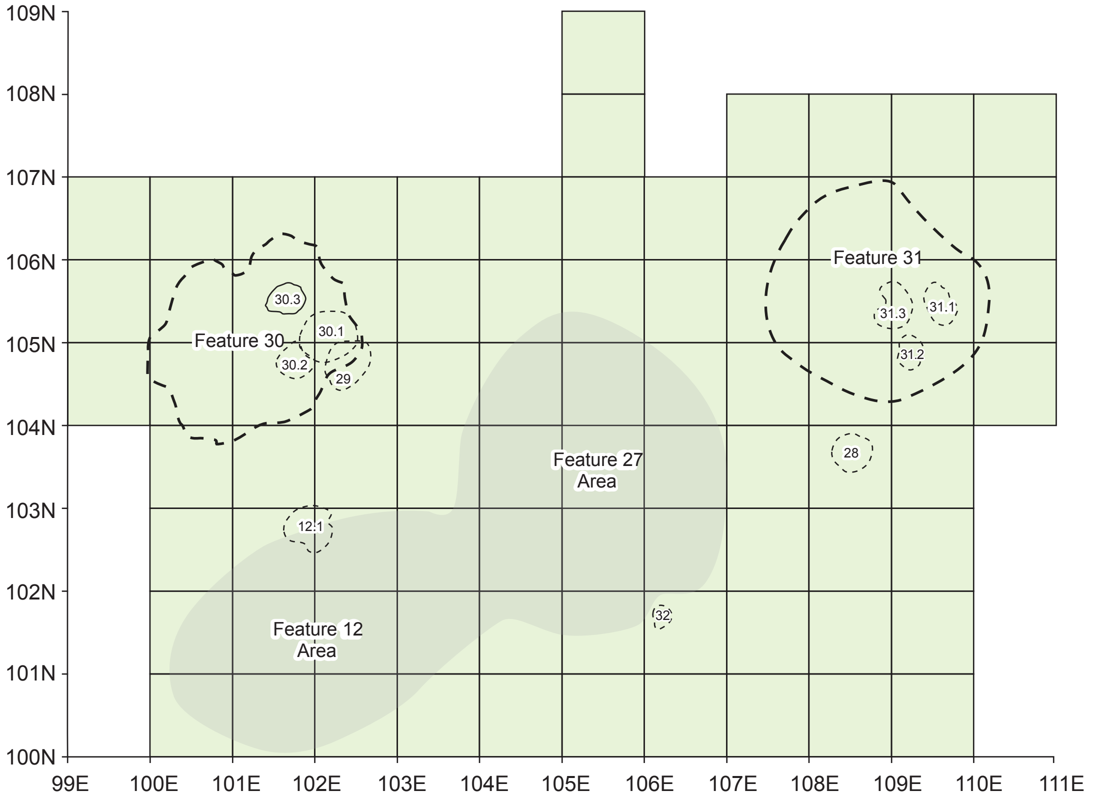


FIGURE 27. 26HU1876 Grid 1 feature plan view.

rock, and was maintained intact during subsequent exposure of this zone of Grid 1. The feature is situated in a 4.0 × 4.5 m area in the southwest corner of Grid 1, although its perimeter was difficult define. It is described as an approximately 20–40 cm thick, charcoal-stained midden deposit, and represents a continuation of the Stratum III deposits described for Feature 27 (see fig. 27). Portions of this feature were capped by as much 30 cm of dune sand, while others were exposed on the surface. The feature rests on compacted, sterile sands and silts. As with Feature 27, it appears to be a somewhat amorphous living surface. A more clearly defined subfeature (12.1) of this living surface is situated along the northern margin of Feature 12 (see fig. 27). This feature is a charcoal-stained basin roughly oval in plan, measuring 55 × 43 cm and more than 20 cm deep. It appears to be a hearth or processing feature. Small amounts of debitage and bone were recovered from the feature.

Two radiocarbon dates, one from Feature 12 and the other from Subfeature 12.1, were obtained from this area; the former produced a median probability date of 876 cal B.P., the latter 964 cal B.P., both confirming a Late Archaic time frame for Feature 12. A number of bifaces, formed and simple flake tools, cores, and debitage were also recovered from the feature; ground stone was limited to two nondiagnostic fragments (table 25).

Feature 27. This feature is described as a dense lens of charcoal and charcoal-stained deposits (Stratum II) that ranges from 20 to 40 cm thick and lies on compacted sterile sands and silts (Stratum I). The contact between these two strata undulates, creating several pitlike pockets of midden. The area is roughly oval in shape and merges

TABLE 23
Radiocarbon Dates from 26HU1876
TU – test unit.

Cat. No.	Locus	Provenience	Feature	Level	Lab. No. (Beta-)	Sample Description	Delta ^{13}C	Conventional Age	Error	Median Probability (cal B.P.)	2σ Range
20072	–	Feature 30	30	–	386886	Greasewood charcoal	-21.6	960	±30	856	796–929
20070	–	Feature 28	28	2	386885	Rabbitbrush charcoal	-22.3	970	±30	860	796–933
20073	–	Feature 30.1	30.1	–	343317	Charcoal	-23.5	970	±30	860	796–933
20076	–	TU N101/E104	12	8	339422	Greasewood charcoal	-22.9	980	±30	876	796–956
20074	–	Feature 31	31	–	386887	Greasewood charcoal	-22.9	990	±30	913	798–961
20071	–	Feature 29	29	–	343316	Charcoal	-23.5	1020	±30	941	829–981
20069	–	Feature 12.1	12.1	–	386884	Greasewood charcoal	-22.7	1060	±30	964	927–1052
20075	–	Feature 31.1	31.1	–	386888	Greasewood charcoal	-22.7	1080	±30	985	932–1059

TABLE 24
Projectile Point Assemblage from 26HU1876
CCS = cryptocrystalline silicate.

Projectile Point	Late Archaic B		Noncomponent		Total
	Obsidian	CCS	Obsidian	CCS	
Northern Side-notched	1	–	–	–	1
Elko	–	–	2	–	2
Rosegate	4	10	–	–	14
Small Stemmed	–	–	–	1	1
Cottonwood	–	–	–	1	1
Desert Side-notched	–	2	–	–	2
Indeterminate	–	1	–	–	1
Total	5	13	2	2	22

TABLE 25
Artifact Inventory from 26HU1876

Type	Late Archaic B	Noncomponent	Total
Flaked stone			
Projectile point	18	4	22
Biface	97	11	108
Drill	1	–	1
Formed flake tool	8	1	9
Flake tool	56	–	56
Cobble tool	3	–	3
Core	7	–	7
Debitage	18,600	38	18,638
Ground stone			
Millingstone	19	1	20
Misc. ground stone	6	–	6
Misc. prehistoric items			
Bead, bone	2	-	2
Awl	3	-	3
Modified bone	1	–	1
Modified stone	1	–	1
Faunal remains			
Bone	2464	4	2468
Total	21,286	59	21,345

with Feature 12 to the southwest (see fig. 27); both appear to represent a living surface of some sort.

No radiocarbon dates were obtained from this feature, although the stratigraphic context is comparable to the other Late Archaic features in Grid 1. Feature 27 contains a range of artifacts and habitation debris similar to the adjacent structures (i.e., projectile points, bifaces, flake

FIGURE 28. 26HU1876 Feature 30 preexcavation overview.

FIGURE 29. 26HU1876 Feature 30 profile.

FIGURE 30. 26HU1876 Feature 30 postexcavation overview.

tools, millingstones, debitage, and faunal bone). Field excavators reported a comparatively high density of CCS debitage, much of it heat treated, and speculated that the feature might have been a processing area for lithic production.

Feature 28. This feature is a small, circular, basin-shaped zone of soil discoloration and fire-affected rock located in Unit 103N/108E. It measures 47 × 48 cm in diameter, and is 9 cm in maximum vertical extent. The feature is interpreted as a hearth, possibly associated with external domestic activity centered around the Feature 31 house structure located immediately adjacent. A median probability date of 860 cal B.P. (see table 23) was obtained from rabbitbrush charcoal at Feature 28. Only a small amount of bone was recovered.

Feature 32. Feature 32 is a small, basin-shaped charcoal concentration measuring about 25 × 20 cm, located on the southern periphery of Feature 27 (see fig. 27). It extends between 79 and 89 cm below the surface. The feature contained no artifactual debris or faunal material and was inferred by field personnel to have functioned as a possible smudge pit.

Discussion and Component Definition: The Grid 1 exposure revealed a feature complex consisting of two house structures (features 30 and 31), several adjacent midden concentrations inferred to be living surfaces associated with the houses (features 12 and 27), as well as a series of smaller, discrete circular basin features generally inferred to be hearths or processing features. In addition, the houses themselves exhibit a variety of similar, small, basin features also interpreted as hearths or processing features. Most of this feature assemblage was constructed on sterile, compacted silts and sands some 60 to 80 cm below the original ground surface (Stratum I).

The available radiometric data from these features and subfeatures documented within the Grid 1 exposure indicates a very narrow occupation spanning between 950 and 850 cal B.P. in the Late Archaic Period. This apparent contemporaneity suggests that the Grid 1 features and deposits are part of a complex habitation exhibiting a community-level structure; therefore, all of the Grid 1 Area materials probably date to the Late Archaic Period. Because the narrow range of dates corresponds to the latter end of this interval, the component is designated Late Archaic B to distinguish it from the earlier Late Archaic A components identified at 26HU1830.

The small quantity of artifacts documented outside of the Grid 1 Area is considered atemporal and designated noncomponent.

Assemblage

More than 24,000 archaeological items were recovered form 26HU1876, the vast majority consisting of debitage and bone fragments (see table 25). The assemblage includes the full complement of flaked stone tools (projectile points, bifaces, drills, formed flake tools, core tools, cobble tools, and cores), and a more limited assemblage of ground stone (millingstones, and miscellaneous ground stone). Other artifacts recovered include, modified bone and ochre, as well as modified stones and manuports. As previously mentioned, almost all this material was recovered from the Grid 1 Area and is dated to the latter end of the Late Archaic Period. Provided below is a more in-depth discussion of each artifact and ecofact class.

Late Archaic B Component: *Projectile Points*. A total of 18 projectile points were found in the Late Archaic B component. They consist mainly of Rose Spring–series variants, but also include two Desert Side-notched points and one indeterminate form (see table 24). Thirteen are fashioned from CCS and five from obsidian. The CCS specimens are mostly complete or near complete; only four are fragmentary. The obsidian points comprise three whole or near-complete specimens and two proximal fragments.

Bifaces. A total of 97 bifaces was recovered from Late Archaic contexts at the site (table 26). In contrast to the obsidian-rich Middle Archaic components from this project, the vast majority of this tool class was fashioned from CCS (93%), while only 7% was made from obsidian. The two

TABLE 26
Flaked Stone Tool Inventory from 26HU1876
CCS – cryptocrystalline silicate; FGV – fine-grained volcanic.

Type	Late Archaic B					Noncomponent		Total
	Obsidian	CCS	FGV	Felsite	Slate	Obsidian	CCS	
Biface								
Stage 1	–	2	–	–	–	–	–	2
Stage 2	–	6	–	–	–	–	1	7
Stage 3	–	17	–	–	–	–	3	20
Stage 4	–	34	–	–	–	–	4	38
Stage 5	2	15	–	–	–	1	–	18
Indeterminate stage	4	17	–	–	–	–	2	23
Subtotal	6	91	–	–	–	1	10	108
Drill								
Lenticular bit cross section	–	1	–	–	–	–	–	1
Subtotal	–	1	–	–	–	–	–	1
Formed flake tool								
Biface-reduction flake blank	–	1	–	–	–	–	–	1
Interior flake blank	–	3	–	–	–	–	–	3
Cortical flake blank	–	2	–	–	–	1	–	3
Indeterminate blank type	–	2	–	–	–	–	–	2
Subtotal	–	8	–	–	–	1	–	9
Average number of modified edges	–	1.8	–	–	–	3	–	1.9
Flake tool								
Reworked biface blank	1	–	–	–	–	–	–	1
Biface-reduction flake blank	–	13	–	–	–	–	–	13
Interior flake blank	–	24	6	–	–	–	–	30
Cortical flake blank	–	1	5	–	–	–	–	6
Flake blank	–	1	–	–	–	–	–	1
Indeterminate blank type	–	4	–	–	1	–	–	5
Subtotal	1	43	11	–	1	–	–	56
Average number of modified edges	1	1.4	1.6	–	1	–	–	1.4
Cobble tool								
Angular cobble blank	–	1	–	2	–	–	–	3
Subtotal	–	1	–	2	–	–	–	3
Core								
Multidirectional	–	5	–	–	–	–	–	5
Unidirectional	1	–	–	–	–	–	–	1
Indeterminate form	–	1	–	–	–	–	–	1
Subtotal	1	6	–	–	–	–	–	7
Total	8	150	11	2	1	2	10	184

diagnostic obsidian bifaces are finished, Stage 5, pressure-flaked implements, whereas the CCS bifaces are more evenly spread among all reduction stages, suggesting that a full range of CCS reduction occurred in these components. The pattern indicates an intensification of local toolstone procurement and processing during this period.

Formed Flake Tools and Drills. Formed flake tools exhibit purposefully modified (retouched) edges that are used for a variety of cutting, scraping, and chopping tasks associated with a variety of materials (e.g., wood, bone, hide, as well as roots, tubers, and other plant material). A total of eight formed flake tools and one drill was recovered from Late Archaic components; all fashioned from CCS (see table 26). Where it could be determined, most of the formed flake tools were fashioned from either cortical or interior flakes; one specimen was made from a biface-thinning flake. The drill exhibited a lenticulate-shaped bit in cross section.

Flake Tools. A total of 56 simple flake tools was recovered from the Late Archaic B component (see table 26). These more expedient tools are identified by observable edge damage resulting from use. While CCS is again the preferred raw material for this tool class (77%), the assemblage also includes a significant number of flake tools fashioned from a fine-grained volcanic material (20%). These may have been used for heavier-duty scraping and cutting tasks, as nearly half of the fine-grained volcanic flake tools are made from larger cortical flakes. Most of the CCS flake tools are fashioned from biface-thinning flakes or interior flake blanks.

Cores and Cobble Tools. Core reduction is indicated by the recovery of seven cores, six CCS and one obsidian. Where flake-scar orientation could be determined, all of the CCS cores exhibited a multidirectional orientation, whereas the obsidian core was unidirectional. Noteworthy is the higher frequency of early-stage CCS bifaces versus cores, as well as a similar trend toward biface reduction indicated in the debitage sample.

Two felsite cobble tools were also recovered, both made from angular cobble blanks. No felsite debitage was recovered from the site, suggesting that these cobble tools were not made on-site but transported from elsewhere. An additional CCS cobble tool was also documented. Together, these tools are functionally tied to heavy processing (e.g., the chopping, shredding, and pulping of tough, fibrous vegetal matter).

Debitage. A total of 18,600 unmodified flaked was recovered from the Late Archaic component (table 27). Fully 99% of this material is CCS, and the remaining 1% is mostly obsidian with trace amounts of fine-grained volcanic and quartz. Most of the obsidian originated from the Mount Majuba source (but XRF analysis was performed on only five specimens; see below, Obsidian Conveyance Patterns). This overall pattern marks a continuing trend through time toward greater use of more local CCS. A technological analysis of a sample of CCS debitage recovered this component indicates emphasis on biface thinning and biface production, which is also reflected in the biface production stages represented in the component. Core-flake production is also indicated, but appears to have been less sustained than biface production. As might be expected within a multifeature habitation area, tool finishing and resharpening occurred with some regularity.

Ground Stone. A total of 19 millingstones was recovered from the Late Archaic component, most from the Feature 30 house structure. Felsite and sandstone were the preferred materials for this tool class. Use wear is limited to light and moderate grinding. Interestingly, no handstones are reported from the site. The miscellaneous ground stone assemblage may include fragments of the missing handstones, as this category also includes specimens fashioned from fine-grained volcanic material. Use wear includes both light and moderate grinding, as well as some edge step fracturing. The presence of milling and processing equipment indicates that plant procurement and processing was an important element of the suite of habitation activities represented at the Grid 1 feature complex.

Modified Bone. Five modified bone artifacts were recovered from Late Archaic contexts at the site, including two tube beads and three awl frag-

TABLE 27
Debitage Analysis from 26HU1876
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic; Indet. = indeterminate.

Type	Late Archaic B					Noncomponent		Total
	Obsidian	CCS	FGV	Quartzite	Indet.	Obsidian	CCS	
Diagnostic debitage								
Core reduction	1	14	–	–	–	–	–	15
Core reduction/flake tool production	–	12	–	–	–	–	–	12
Biface production	–	58	–	1	–	–	–	59
Tool finishing/resharpening	1	32	–	–	–	–	–	33
Nondiagnostic debitage								
General percussion	4	315	–	–	–	–	–	319
Indeterminate type	1	443	–	–	–	–	–	444
Not analyzed	79	17,623	15	–	1	4	34	17,756
Total	86	18,497	15	1	1	4	34	18,638

ments. A fragment of modified bone of indeterminate function was also recovered. The tube beads were fashioned from bird and jackrabbit long bones. The awl fragments exhibit more or less continuous zones of polish on mammal bone unascribable to species.

Faunal Remains. A total of 2464 bone and bone fragments was recovered from the Grid 1, Late Archaic component at the site. Seventeen separate taxa were recognized, along with a large number of indeterminate mammalian bone fragments, the latter divided into large (artiodactyl-size), medium (rabbit-size), and small (rodent-size) classes. The identifiable specimens include artiodactyls, jackrabbits, and rodents, as well as a small number of carnivores, birds, lizards, snakes, and other reptiles; all data are presented by component in table 28.

A particular focus of the larger study is the changing use of large-game versus small-game resources, as measured by the AI. The AI for the identifiable artiodactyl and rabbit remains for the Late Archaic component is 0.03, whereas the AI for unidentifiable Late Archaic components is 0.06. Both of these measures show a very strong preference for small game resources during this time.

Noncomponent Areas: As presented in table 25, only a handful of artifacts and other cultural materials were recovered from noncomponent areas of the site, much of it from the surface. Noteworthy are two Elko-series projectile points indicative of Middle Archaic site visitation. Also recovered were several middle- and late-stage CCS bifaces, a formed flake tool, and a millingstone.

Site Summary

Although 26HU1876 is a sprawling multicomponent site, our understanding of the prehistoric occupation at the site comes almost entirely from excavations within the Grid 1 Area. The Grid 1 exposure, amounting to more than 83 m^2, revealed a series of features, the most important of which were floors of two house structures (features 30 and 31). The other features, mostly hearths, living surfaces, and thermal processing features, are situated in immediate proximity to the house structures and appear to be related to the habitation and domestic activities of the houses.

There is little question surrounding the dating of the house structures, features, and midden zones documented within the Grid 1 exposure: all seven radiocarbon dates obtained from this area date to a narrow time span between 950 and 850 cal B.P., i.e., the latter part of the Late Archaic Period (i.e., Late Archaic B). This dating is con-

TABLE 28
Faunal Remains from 26HU1876

Common Name	Taxon	Late Archaic B		Noncomponent		Total	
		Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
Bird							
Bird, perching	Passeriformes	6	0.17	–	–	6	0.17
Bird, indeterminate	Aves, indeterminate	5	0.50	–	–	5	0.50
Mammal							
Artiodactyl, indeterminate	Artiodactyla, indeterminate	7	0.58	1	24.63	8	25.21
Badger	*Melinae*	2	0.78	–	–	2	0.78
Coyote	*Canis latrans*	–	–	1	9.02	1	9.02
Carnivore, indeterminate	Carnivora, indeterminate	3	0.10	–	–	3	0.10
Hare, black-tailed	*Lepus californicus*	221	32.23	–	–	221	32.23
Hare/rabbit	Leporidae	31	1.50	–	–	31	1.50
Mouse, deer	*Peromyscus* spp.	1	0.02	–	–	1	0.02
Mouse, little pocket	*Perognathus longimembris*	1	0.01	–	–	1	0.01
Rat, kangaroo	*Dipodomys* spp.	66	4.56	–	–	66	4.56
Squirrel/chipmunk	Sciuridae	14	0.53	–	–	14	0.53
Woodrat	*Neotoma* spp.	2	0.28	–	–	2	0.28
Rodent, indeterminate	Rodentia, indeterminate	31	0.87	–	–	31	0.87
Mammal, large	Mammalia, large	49	12.67	1	145.44	50	158.11
Mammal, medium	Mammalia, medium	817	76.32	–	–	817	76.32
Mammal, small	Mammalia, small	84	2.09	–	–	84	2.09
Mammal, indeterminate	Mammalia, indeterminate	1031	28.40	1	0.03	1032	28.43
Reptile							
Lizard, horned	*Phrynosoma* spp.	48	0.61	–	–	48	0.61
Lizard	Lacertilia	42	0.47	–	–	42	0.47
Reptile, indeterminate	Reptilia, indeterminate	3	0.01	–	–	3	0.01
Total		2464	162.70	4	179.12	2468	341.82

firmed by the projectile point profile from the exposure, which is dominated by Rosegate-series variants. As we describe in the synthesis chapter of this report, the Grid 1 Habitation Area provides an interesting comparison to earlier dating Late Archaic A components documented at other project sites.

With regard to assemblage structure, we see a continuing trend away from the use of exotic obsidians toward the almost exclusive use of more local CCS. Obsidian comprises just 1% of the Grid 1 debitage, down from 32% in the Middle Archaic components at 26HU1830, and from 6% at the Late Archaic A components dating between 1340 and 1165 cal B.P. at 26HU1830. Flaked stone production at the site, recognized by a complete range of biface stages, is almost entirely centered on local

FIGURE 31. 26HU2871 site overview and well pad area.

CCS. Plant procurement and processing is indicated by the recovery of number of millingstones and millingstone fragments.

Finally, subsistence activities associated with hunting are almost entirely directed at small game resources during this period. The pattern holds for both identifiable faunal remains, as well as those classified only to size category. This, too, is compatible with an apparent intensification directed at locally available resources.

26HU2871 SITE REPORT

Site 26HU2871 is a large (600 × 300 m) accumulation of flaked stone tools and debitage, ground stone implements, and thermal features. It lies on a dissected alluvial fan and is associated with an old spring (fig. 31). Local vegetation is dominated by sagebrush, followed by lower densities of Great Basin rye, hopsage, blackbush, saltbush, rabbitbrush, bitterbrush, and halogeton.

Four artifact concentrations exist at the site. Locus A is located along its southern margin and includes a rather small (20 × 15 m) cluster of debitage (fig. 32). Locus B is larger (40 × 30 m) and is also limited to a concentration of debitage. Locus C (75 × 40 m) is the main occupational locus at the site and includes a rich assortment of artifacts and features. It lies just east of the old spring, and was the primary focus of the data recovery excavations. Finally, Locus D is lies northeast of Locus A, and is a small (15 × 10 m) cluster of flaked stone tools and debitage.

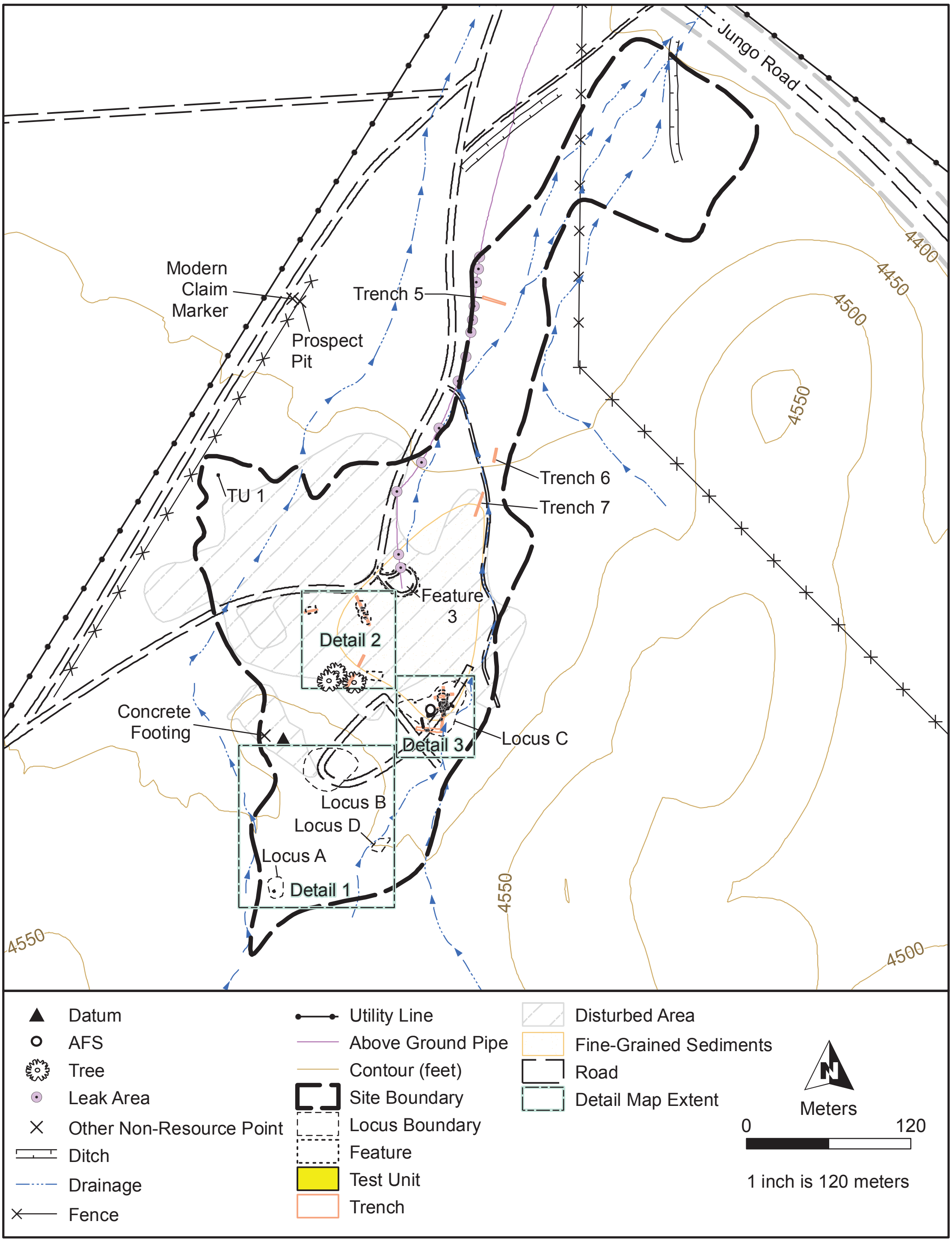


FIGURE 32. 26HU2871 sketch map.

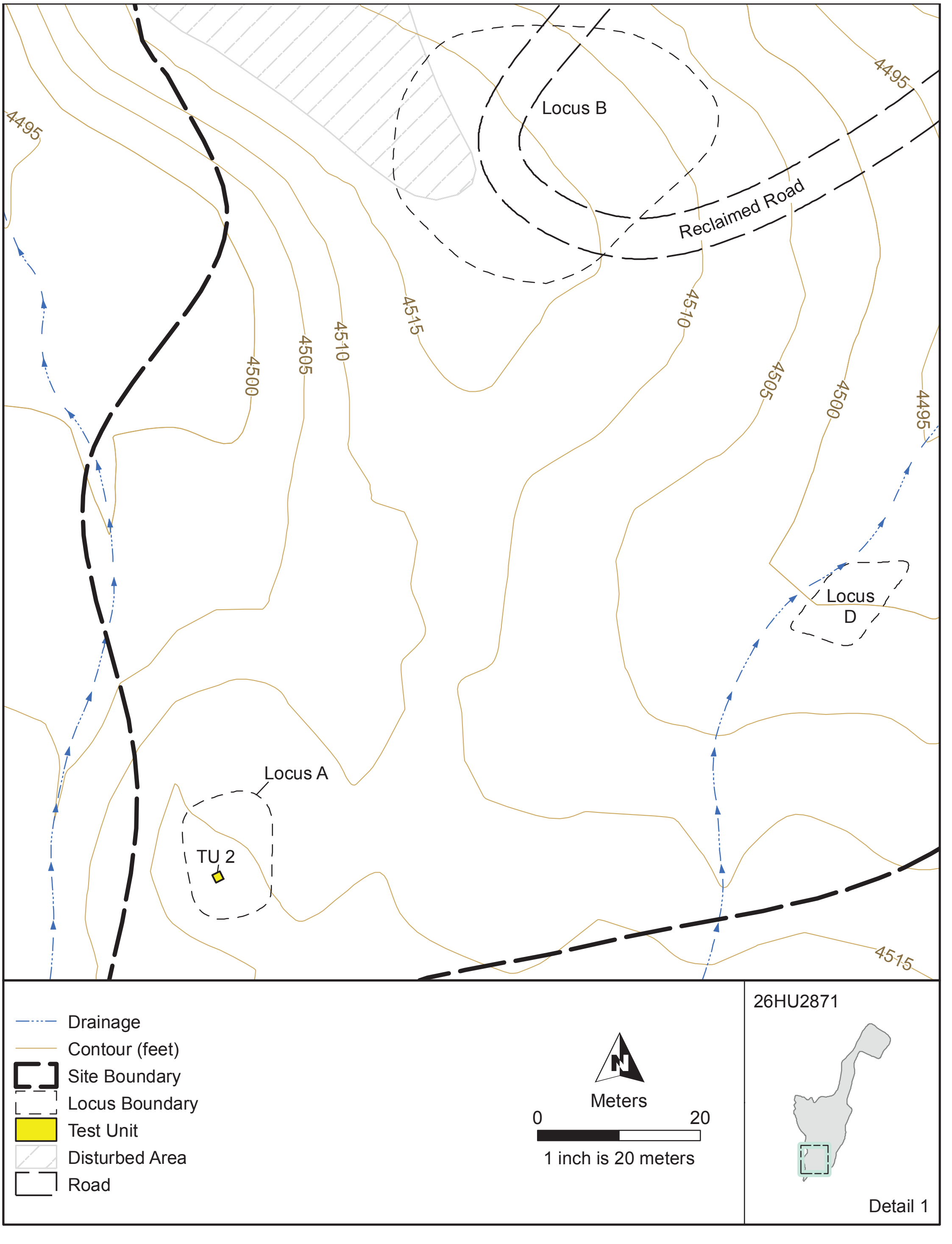


FIGURE 32 (*continued*). 26HU2871 sketch map, Detail 1.

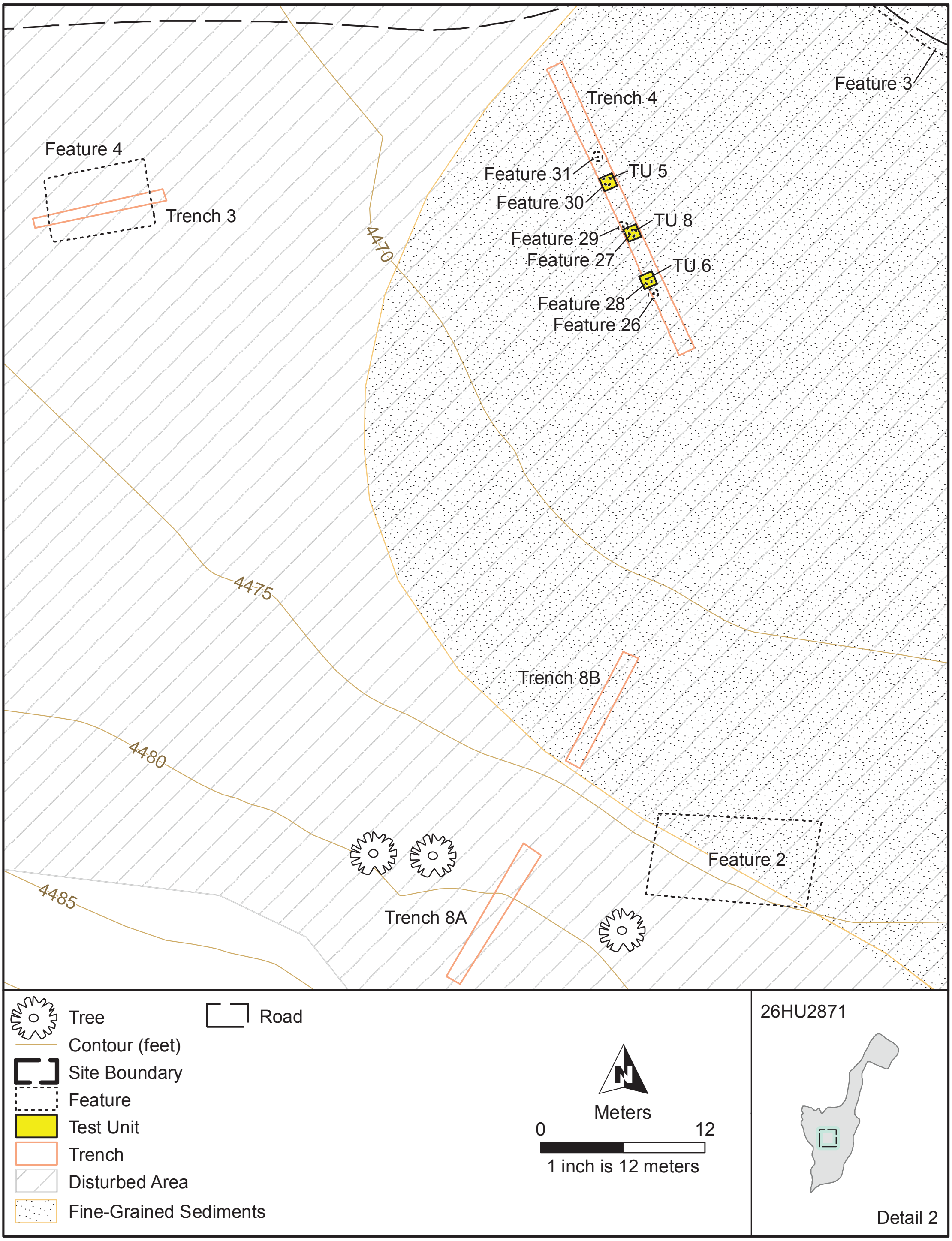


FIGURE 32 (*continued*). 26HU2871 sketch map, Detail 2.

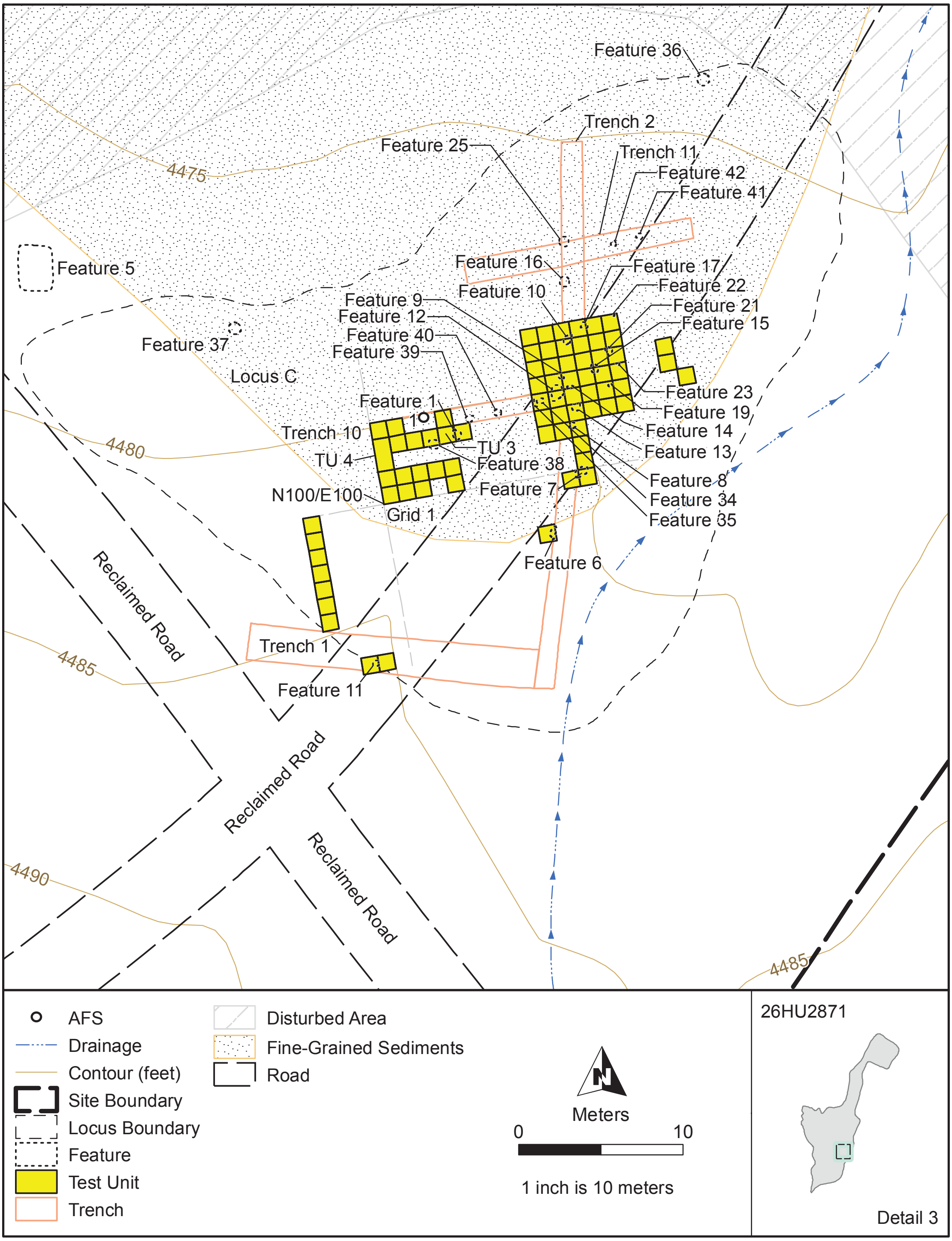


FIGURE 32 (*continued*). 26HU2871 sketch map, Detail 3.

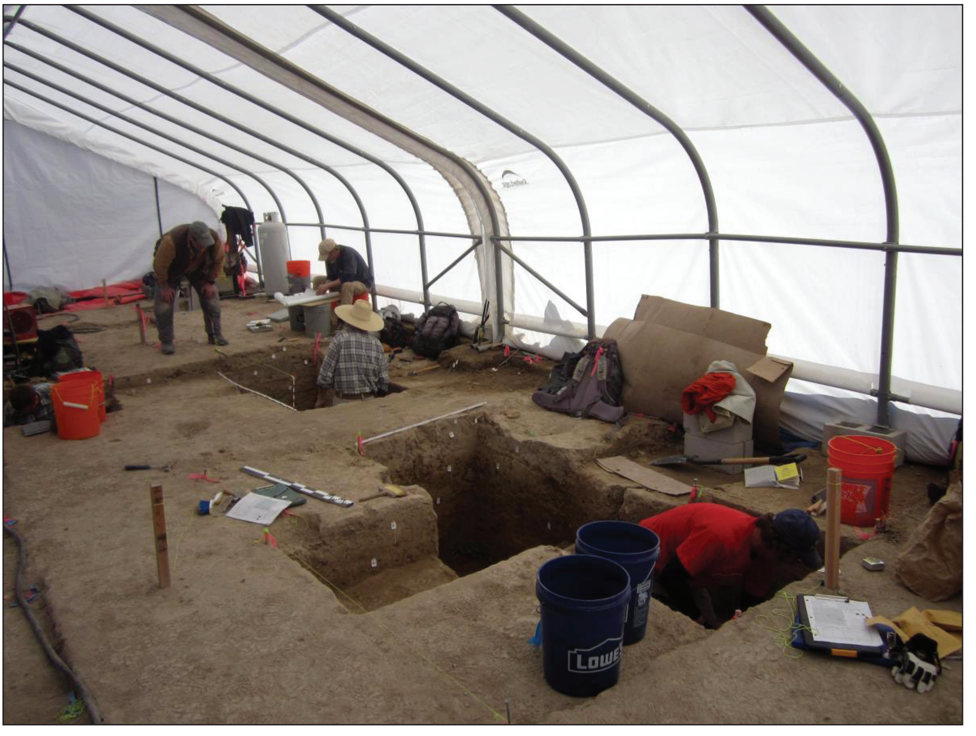


FIGURE 33. 26HU2871 Grid 1 overview and crew working.

Field Methods

Two phases of data recovery took place. Phase 1 began in September 2012, and included mapping, surface collection, subsurface testing, and backhoe trenching (Stoner et al., 2012). Based on the results of this work, it became clear that Locus C had significant subsurface cultural deposits with high frequencies of artifacts, faunal remains, fire-affected rock, and thermal features. As a result, the Phase 2 data recovery program started in October 2012. A formal grid system was established within Locus C (also known as Grid 1), followed by major subsurface excavations within the grid (figs. 33, 34). More than 75 1 × 1 m units were excavated in this location (table 29; see fig. 32: Detail Map 3).

In addition to controlled archaeological excavations, 11 backhoe trenches were excavated at 26HU2871. Ten of the trenches were inspected and described in varying levels of detail depending on the complexity and repetition of stratigraphy, weather conditions, and safe access. Stratigraphy and soils were investigated in three general areas: (1) Locus C trenches and excavations (trenches 1, 2, 10, and 11); (2) trenches in the vicinity of Lewis Spring (trenches 3, 4, 8a, and 8b); and (3) trenches on the fans extending northward along the drainage system (trenches 5, 6, and 7).

Site Structure and Chronology

We begin by reviewing the structural characteristics of the site, providing descriptions of the complex stratigraphy exposed in Locus C and Grid 1, as well as the multiple features encountered. We then review the distribution of time-sensitive projectile points and radiocarbon dates that, when combined with the features and sediment stratigraphy, are used to define a series of single-component areas for the site.

Geomorphology: Site 26HU2871 is centered on a low-gradient, north-sloping pediment form-

FIGURE 34. 26HU2871 Grid 1 overview postexcavation.

ing a north-trending drainage divide along a small set of parallel fault scarps. The landform slopes northward to a remnant spring wetland (Lewis Spring) before extending along two generations of Holocene-age fans and the active ephemeral drainage. The recent fans within the site area are inset into older (Pleistocene) alluvial fans that bound the site on the west and southwest. In exposures in the northern part of the site, the older fan deposits are buried by younger alluvial fan deposits. Colluvial slopes and associated small colluvial fans (talus) border the site on the east side. Large parts of the lower slopes have been disturbed by grading and presumed quarrying or borrow activity. Much of the central area of the site, especially in areas of loci B and C, has been disturbed by historic- and modern-era use, including road and water development. However, topographic undulations in the underlying pediment entrapped sedimentary overbank floods, sheet flows, and aeolian loess throughout the Holocene; these packages remain locally preserved and contain a relatively deep archaeological record. Locus C (fig. 35) is a good local example. This section presents strata descriptions, with special emphasis on Locus C, summarizing data gathered from stratigraphic profiles in backhoe trenches and archaeological excavations. The stratigraphy of Locus C correlates very well with strata throughout the site area.

Stratum I. Where preserved, Stratum I consists of a very thin (<2 cm) zone of organic matter and a thin layer (<8 cm) of fine sand, silt, and abundant roots that comprise the O, A, and C horizons of the surface soil (fig. 35). Stratum I has weak microstratification indicative of low-energy surface tractive flow by water, wind, or both. Some very fine gravel is also found in the deposit. The soil in this stratum is very thin and weakly developed, and its structure is massive to locally weak, very fine platy to granular. It con-

TABLE 29
Excavation Summary for 26HU2871

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Early Archaic (m^3)	Middle Archaic (m^3)	Middle/ Late Archaic (m^3)	Late Archaic (m^3)	Noncom-ponent (m^3)	Total (m^3)
1	Nonlocus	–	1 × 1	–	–	–	–	0.30	0.30
2	A	–	1 × 1	–	–	–	–	0.38	0.38
3	C	Grid 1 N103/E104	1 × 1	–	–	–	–	0.94	0.94
4	C	Grid 1 N102/E100	1 × 2	–	–	–	–	1.74	1.74
5	Nonlocus	Trench 4	1 × 1	–	–	–	–	0.10	0.10
6	Nonlocus	Trench 4	1 × 1	–	–	–	–	0.06	0.06
8	Nonlocus	Trench 4	1 × 1	–	–	–	–	0.02	0.02
N090/E097	C	Grid 1, Trench 1	1 × 1	0.08	–	–	–	–	0.08
N090/E098	C	Grid 1, Trench 1	1 × 1	0.08	–	–	–	–	0.08
N093/E095	C	Grid 1	1 × 1	0.28	–	–	–	0.21	0.49
N094/E095	C	Grid 1	1 × 1	0.25	–	–	–	0.24	0.49
N095/E095	C	Grid 1	1 × 1	1.22	–	–	–	0.71	1.93
N096/E109	C	Grid 1	1 × 1	0.35	–	–	–	–	0.35
N096/E095	C	Grid 1	1 × 1	1.22	–	–	–	0.33	1.55
N097/E095	C	Grid 1	1 × 1	0.34	–	–	–	0.13	0.47
N098/E095	C	Grid 1	1 × 1	0.28	–	–	–	0.20	0.48
N099/E111	C	Grid 1, Trench 2	1 × 1	–	–	0.12	–	0.06	0.18
N099/E112	C	Grid 1, Trench 2	1 × 1	–	–	0.06	–	0.06	0.12
N099/E095	C	Grid 1	1 × 1	0.25	–	–	–	0.15	0.40
N100/E100	C	Grid 1	1 × 1	0.28	–	–	–	0.50	0.78
N100/E101	C	Grid 1	1 × 1	0.35	–	–	–	0.41	0.76
N100/E102	C	Grid 1	1 × 1	0.26	–	–	–	0.64	0.90
N100/E104	C	Grid 1	1 × 1	0.23	–	–	–	–	0.23
N100/E112	C	Grid 1, Trench 2	1 × 1	–	–	–	–	0.15	0.15
N101/E100	C	Grid 1	1 × 1	0.37	–	–	–	0.49	0.86
N101/E101	C	Grid 1	1 × 1	0.20	–	–	–	0.59	0.79
N101/E102	C	Grid 1	1 × 1	0.23	–	–	–	0.57	0.80
N101/E103	C	Grid 1	1 × 1	0.27	–	–	–	0.55	0.82
N101/E104	C	Grid 1	1 × 1	0.25	–	–	–	0.85	1.10
N101/E112	C	Grid 1, Trench 2	1 × 1	–	–	–	0.15	0.07	0.22
N102/E110	C	Grid 1	1 × 1	–	–	–	0.07	0.13	0.20
N102/E111	C	Grid 1, Trench 2	1 × 1	–	–	–	0.20	0.22	0.42
N102/E112	C	Grid 1, Trench 2	1 × 1	–	–	–	0.10	0.31	0.41
TU N103/E101	C	Grid 1	1 × 1	0.48	–	–	–	0.48	0.96
N103/E102	C	Grid 1	1 × 1	0.26	–	–	–	0.53	0.79
N103/E103	C	Grid 1	1 × 1	0.15	–	–	–	0.76	0.91
N103/E105	C	Grid 1	1 × 1	–	–	–	–	0.79	0.79
N103/E110	C	Grid 1	1 × 1	–	–	–	0.16	0.07	0.23
N103/E111	C	Grid 1	1 × 1	–	–	–	–	0.42	0.42
N103/E112	C	Grid 1	1 × 1	–	–	–	–	0.02	0.02

TABLE 29 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Early Archaic (m^3)	Middle Archaic (m^3)	Middle/ Late Archaic (m^3)	Late Archaic (m^3)	Noncom- ponent (m^3)	Total (m^3)
N103/E113	C	Grid 1, Trench 2	1 × 1	–	–	–	0.02	0.20	0.22
N103/E114	C	Grid 1	1 × 1	–	–	–	0.13	0.06	0.19
N103/E115	C	Grid 1	1 × 1	–	–	–	0.04	0.15	0.19
N104/E100	C	Grid 1	1 × 1	–	–	–	–	0.55	0.55
N104/E101	C	Grid 1	1 × 1	0.30	–	–	–	0.38	0.68
N104/E104	C	Grid 1	1 × 1	0.19	–	–	–	0.49	0.68
N104/E110	C	Grid 1	1 × 1	–	0.62	0.20	0.05	0.32	1.19
N104/E111	C	Grid 1, Trench 2	1 × 1	–	0.58	0.21	0.05	0.44	1.28
N104/E112	C	Grid 1, Trench 2	1 × 1	–	0.64	0.14	0.10	0.42	1.30
N104/E113	C	Grid 1, Trench 2	1 × 1	–	0.67	0.30	0.39	0.45	1.81
N104/E114	C	Grid 1	1 × 1	–	0.52	0.15	0.05	0.49	1.21
N104/E115	C	Grid 1	1 × 1	–	0.51	0.23	0.23	0.36	1.33
N104/E119	C	Grid 1	1 × 1	–	–	–	–	0.13	0.13
N105/E110	C	Grid 1	1 × 1	–	–	–	0.10	0.17	0.27
N105/E111	C	Grid 1, Trench 2	1 × 1	–	0.58	0.20	0.09	0.37	1.24
N105/E112	C	Grid 1, Trench 2	1 × 1	–	–	–	0.10	0.04	0.14
N105/E113	C	Grid 1, Trench 2	1 × 1	–	–	–	0.04	0.14	0.18
N105/E114	C	Grid 1, Trench 2	1 × 1	–	–	–	0.08	0.10	0.18
N105/E115	C	Grid 1, Trench 2	1 × 1	–	0.68	0.18	0.06	0.30	1.22
N105/E118	C	Grid 1, Trench 2	1 × 1	–	–	–	–	0.18	0.18
N106/E110	C	Grid 1, Trench 2	1 × 1	–	–	–	0.16	0.05	0.21
N106/E111	C	Grid 1, Trench 2	1 × 1	–	–	–	0.06	0.20	0.26
N106/E112	C	Grid 1, Trench 2	1 × 1	–	–	–	0.03	0.16	0.19
N106/E113	C	Grid 1, Trench 2	1 × 1	–	–	–	0.06	0.32	0.38
N106/E114	C	Grid 1	1 × 1	–	0.62	0.20	0.10	0.31	1.23
N106/E115	C	Grid 1, Trench 2	1 × 1	–	0.92	0.09	0.18	0.30	1.49
N106/E118	C	Grid 1	1 × 1	–	–	–	–	0.13	0.13
N107/E110	C	Grid 1	1 × 1	–	–	–	0.03	0.11	0.14
N107/E111	C	Grid 1, Trench 2	1 × 1	–	–	–	0.07	0.08	0.15
N107/E112	C	Grid 1, Trench 2	1 × 1	–	–	–	0.14	0.12	0.26
N107/E113	C	Grid 1, Trench 2	1 × 1	–	–	–	0.17	0.09	0.26
N107/E114	C	Grid 1	1 × 1	–	0.48	0.20	0.10	0.33	1.11
N107/E115	C	Grid 1	1 × 1	–	0.65	0.12	0.03	0.44	1.24
N108/E110	C	Grid 1	1 × 1	–	–	0.10	–	0.12	0.22
N108/E111	C	Grid 1	1 × 1	–	–	0.06	–	0.11	0.17
N108/E112	C	Grid 1	1 × 1	–	–	–	0.16	0.07	0.23
N108/E113	C	Grid 1	1 × 1	–	–	–	0.14	0.05	0.19
N108/E114	C	Grid 1	1 × 1	–	0.44	0.20	0.15	0.35	1.14
N108/E115	C	Grid 1	1 × 1	–	0.66	0.10	0.14	0.38	1.28
Total				8.17	8.57	2.86	3.93	23.64	47.17

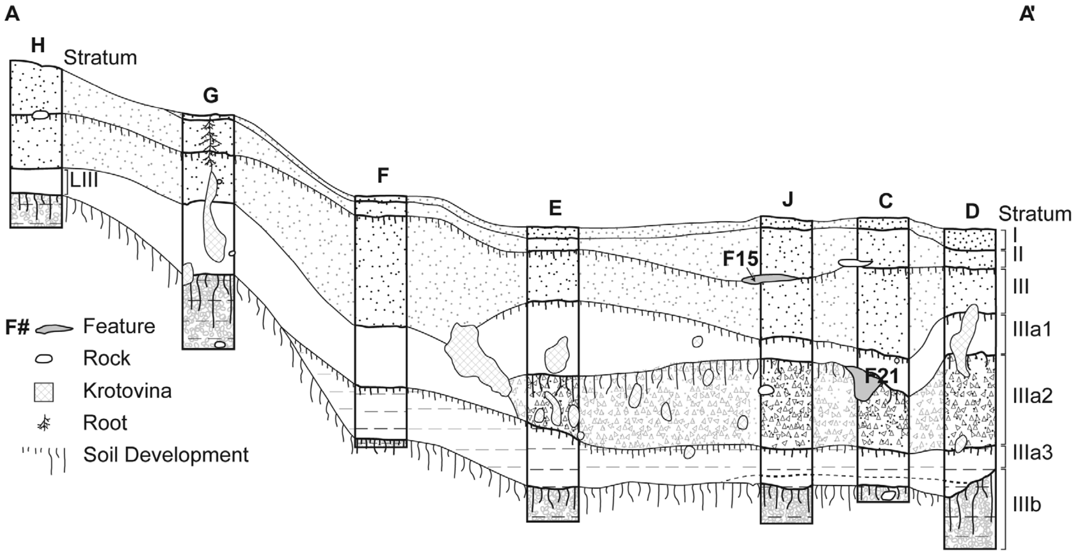


FIGURE 35. 26HU2871 Locus C stratigraphic profile.

tains calcium carbonate and is strongly effervescent when hydrochloric acid is applied.

A small hearth (Feature 1) within Stratum I produced a date of 697 cal B.P. (table 30). It is the most recent dated feature at the site and provides a limiting age for deposition of the sandy stratum within Locus C. Its young age is consistent with the weak degree of soil development observed. The date and the stratigraphic setting are also consistent with a Late Archaic Component designation for the assemblage found in this stratum (see Component Definition).

Stratum II. Stratum II is generally about 10 to 15 cm thick and composed of massive silt. It also contains small, thin (~10 cm) deposits of coarse sand and pebbly to fine, graded gravel filling shallow rills and small channels 15 to 25 cm wide. Fine to medium gravel is concentrated along the contact with the underlying stratum. The mixed-lithology gravel is mostly angular to subangular clasts 1 to 2 cm in long axis, although some larger clasts (3 to 5 cm) are present.

The upper part of the stratum shows a weak, thin, discontinuous, and slightly vesicular soil horizon with weak platy structure. The soil transitions in the lower part of Stratum II to a Bw horizon that becomes slightly reddened with depth and has massive to moderate, medium angular blocky peds; silt coatings line pores and bridge sand grains. Bioturbation is observed near the top of Stratum II and is characterized by burrows and fecal pellets of worms and insects; the burrows are typically a few millimeters in diameter. The lower contact with Stratum III is wavy to irregular and marked by the presence of fine gravel indicative of surface erosion.

Based on dated charcoal from hearth features, cultural features buried within Stratum II range in age from 1470 to 790 years cal B.P. (table 30). It is likely that brief pulses of sediment deposition buried the features over that period of time, and later features (i.e., those with dates similar to those found in Stratum I) may have been dug into Stratum II. Depositional pauses are apparent as thin turbation horizons marked by worm and insect burrows and fecal remains, but clear sedimentary breaks within Stratum II are absent. Soil formation consisting of weak Bwk permeating through the stratum is commensurate with 1000 to 2000 year old soils in the Great Basin. The date and the stratigraphic setting are also consistent with

TABLE 30
Radiocarbon Dates from 26HU2871

Cat. No.	Locus	Provenience	Feature	Level	Stratum	Lab No. (Beta-)	Sample Description	Delta ^{13}C	Conventional Age	Error	Median Probability (cal B.P.)	2σ Range
20077	C	Feature 1	1	–	I	335343	Greasewood charcoal	-21.7	770	±30	697	669–733
19971	C	Feature 10	10	–	II	383160	Charcoal	-23.2	880	±30	788	729–908
20084	C	Feature 41	41	–	II	386892	Greasewood charcoal	-24.1	890	±30	810	733–909
20085	–	TU 5	30	1	II	386890	Greasewood charcoal	-23.8	890	±30	810	733–909
20080	C	Feature 19	19	–	II	386889	Sagebrush charcoal	-22.8	1080	±30	985	932–1056
20090	C	TU N105/E115	–	6	IIIa1	343315	Charcoal	-23.3	1270	±30	1225	1147–1287
19968	C	Feature 7	7	–	II	386881	Rabbitbrush Charcoal	-22.7	1330	±30	1273	1184–1301
20082	C	Feature 34	34	–	IIIa1	386891	Shadscale charcoal	-10.7	1390	±30	1305	1278–1346
20083	C	Feature 38	38	–	Lower III	345541	Charcoal	-22.6	1420	±30	1323	1290–1368
20079	C	Feature 14	14	–	II	383161	Charcoal	-23.6	1540	±30	1451	1365–1524
20078	C	Feature 13	13	–	II	339421	Sagebrush charcoal	-23.6	1570	±30	1468	1395–1533
20092	C	TU N108/E115	–	4	IIIa1	350357	Mammal bone	-19.1	1930	±30	1879	1820–1946
20087	C	TU N104/E111	–	9	IIIa2	343439	Charcoal	-23.3	3010	±30	3200	3135–3334
20089	C	TU N104/E115	–	15	IIIb	342266	Charcoal	-21.8	3250	±30	3474	3399–3561
20081	C	Feature 21	21	–	IIIa2	342265	Charcoal	-21.7	3360	±30	3604	3555–3691
20088	C	TU N104/E112	–	8	IIIa3	343314	Charcoal	-23.7	3400	±30	3645	3572–3714
20086	C	TU N104/E111	–	7	IIIa2	343438	Charcoal	-22.6	3990	±30	4476	4415–4523
19956	C	TU N100/E102	–	4	IIIb	350355	Mammal bone	-18.2	6970	±30	7803	7706–7922
20091	C	TU N106/E114	–	15	IIIb	392068	Sediment	-22.9	10,210	±40	11,916	11,760–12,086

a Late Archaic Component designation for the assemblage found in this stratum.

Stratum III. Stratum III is considered separate from the underlying stratigraphic units defined as Strata IIIa1, IIIa2, and IIIa3. It consists of massive to very weakly stratified, very fine sand and silt. Some fine gravel (3 to 5 mm) is present, mostly floating in the fine-grained matrix and filling krotovina, which are quite common within this most highly turbated stratum within the local stratigraphic sequence. The undulatory nature of the upper contact is consistent with erosion of the upper part of Stratum III prior to Stratum II deposition.

The soil observed on Stratum III is relatively weakly developed. Remnants of a buried, weakly developed Avk horizon are suggested by a thin zone of platy structure with weak vesicle development that also shows a narrow zone (~10 cm) of bioturbation expressed as small, infilled burrows. The stratum shows weak to moderate evidence of a buried Bwk horizon with massive to weak, coarse, subangular blocky structure. Silt coatings are observed in pores, bridging sand grains, and partially lining gravel clasts. The contact with the underlying Stratum IIIa1 along the eastern end of the profile is usually sharp and undulating to planar, and in places is marked by the presence of small gravel.

If not for the remnants of the discrete Avk horizon and the thin zone of bioturbation near the top of Stratum III, it would appear that the soil formed on Stratum III is a continuation of the soil of Stratum II. However, the weak soil development caps and isolates a turbated deposit lacking radiocarbon dates and containing a mixed assemblage of temporally diagnostic artifacts—the assemblage from this stratum could not be assigned to a temporal component with any confidence.

Stratum IIIa1. Stratum IIIa1 consists of massive silt and very fine grained, subangular to subrounded sand. The deposit contains rounded fine gravel and subangular to subrounded, medium gravel floating in the fine-grained matrix and filling krotovina. Some original bedding and sedimentary structure is present, but most has been destroyed by bioturbation and pedogenesis. Bioturbation from small burrowing organisms is evident throughout much of the deposit, but very prominent near the upper contact. The frequency of krotovina in the stratum is very high. The soil formed on Stratum IIIa1 is weakly to moderately developed and consists primarily of a Bwk horizon. In places near the top of IIIa1, remnants of a vesicular A horizon can be seen as small blocks of silt that have platy structure and numerous small, irregular, vesicles.

Radiocarbon dates on charcoal from features and elsewhere in the Stratum IIIa1 deposits cluster between about 1320 and 1230 cal B.P. The assemblage from Stratum IIIa1 comprises a Middle/Late archaeological component.

Lower III. The massive deposit of Stratum III is not clearly split by Stratum IIIa1 in the western portion of Locus C where a gradient climbs to a low hummock. This hillslope, a pediment remnant, was not subject to the sequential deposition elsewhere in the locus. Although not directly dated, this deposit formed relatively early in the Holocene (it contains older projectile points) resting directly on the strong paleosol on the hilltop to the west. However, the deposit is heavily turbated and appears to be an eastward slump due to alluvial reworking. This depositional event occurred about the same time as deposition of Stratum IIIa2 and prior to Stratum IIIa3, and interfingers with the sequential strata of the deep portion of the locus (i.e., IIIa1 and IIIa2), and rests abruptly on Stratum IIIa3. The archaeological assemblage in this turbated and reworked stratum could not be assigned to a temporal component with any confidence.

Strata IIIa2 and IIIa3. Stratum IIIa2 is a very recognizable, highly bioturbated, fine-grained stratum with a texture of silt to medium sand. Reworked and heavily weathered Mazama tephra is present throughout the stratum. A moderate to well-developed soil is formed on Stratum IIIa2. The soil consists of a Bwk horizon in the upper 20 cm and two Btk horizons beneath the Bwk. The Bwk has generally massive structure, while the transitions to the Btk horizons show massive to weak subangular blocky structure with silt coatings and clay films lining pores and bridging grains. Separated by brief soil formation, Stratum IIIa3 is very similar to IIIa2, with little change in local depositional environment, marking the beginning of multiple, relatively thin sequences of fine-grained beds of aeolian silt and alluvial sand and gravel. Bioturbation from small burrowing organisms is evident throughout much of the IIIa3 deposit, but is less prevalent than that observed in Strata III, IIIa1, and IIIa2.

Charcoal within Stratum IIIa2 was deposited sometime between 4480 and 3200 cal B.P. (see table 30), and certainly well after the primary deposition of Mazama ash (~7700 cal B.P.). Feature 21, excavated into Stratum IIIa2 near the end of its deposition, contained charcoal dated to about 3600 cal B.P. A charcoal date from Stratum IIIa3 falls within the range from Stratum IIIa2, so separating the two strata temporally is not possible. While bioturbation may have mixed the deposits to a considerable degree, Stratum IIIa2 more than Stratum IIIa3, it is likely that these stratigraphic units were deposited in relatively rapid succession. The paleosol on Stratum IIIa2 is strongly developed, but this is likely due to silica enrichment due to the presence of volcanic glass. The alkalinity of dust derived from the Black Rock Desert playa has likely played a role in the apparent accelerated weathering of the Mazama ash, and the resulting soil development capping the fine-grained sequence. The archaeological assemblage derived from Strata IIIa2 and IIIa3 comprises a Middle Archaic cultural component.

Strata IIIb and IV. The deepest sedimentary stratum across much of the site, and clearly observed within Locus C, is Stratum IIIb. Stratum IIIb and the eroded pediment surface (Stratum IV) are alluvial deposits that are Pleistocene or older in age. A strongly developed paleosol formed on Stratum IIIb and extending into IV, shows a locally diagnostic "polka dot" pattern of secondary calcium-carbonate-cemented casts of roots and burrows, and other pedogenic accumulations in the Btk horizon, where secondary carbonate appears in isolated concentrations and as filaments. Reddened clay films (7.5YR) occupy well-formed ped faces, line pores, and coat fine gravel. Together, these soil characteristics are consistent with a latest Pleistocene age. Soil organics formed in Stratum IIIb are a minimum of 11,920 years old, as the landform was deposited prior to formation of the soil (see table 30). Older alluvial fans to the west have well-developed soils similar to the soil seen in IIIb and are truncated by the Sehoo highstand, indicating a pre-Sehoo age. The limited Middle Archaic archaeological assemblage found within this and underlying Stratum IV was deposited on the relict landform and, displaced downward by turbation and into once open burrows or structural spaces; it is likely temporally associated with the assemblage buried within and by the overlying strata (IIIa2 and IIIa3).

FEATURES: Thirty-three features were identified at 26HU2871 (table 31), 19 within the Grid 1 portion of the site, and the remaining 14 in surrounding backhoe trenches and hand-excavation units within Locus C. They include hearths, indeterminate thermal features, and artifact concentrations. Hearths (n = 19) are well-defined concentrations of charcoal (or charcoal staining) that are circular or basin in shape. Most of them contain flaked stone tools and debitage, while a lesser number have fire-affected rock and faunal remains. Indeterminate thermal features (n = 12) contain charcoal-stained sediment but they lack a well-defined boundary or shape; the majority of these were not excavated so the details of their associated assemblages are unknown. Of the ones that were excavated, some include limited amounts of fire-affected rock and/or flaked stone artifacts, but none include faunal remains. Finally, artifact concentrations (n = 2) are unique, high-density clusters of artifacts found on the surface of the site.

Hearths. These features are bimodal in their maximal horizontal dimension. The larger group (>50 cm; n = 7) produces a mean of 64.6 cm (standard deviation [s.d.] = 12.5; coefficient

TABLE 31
Feature Summary for 26HU2871
cmbs = centimeters below surface; Conc. = concentration; FAR = fire-affected rock; N = not present; PPT = projectile point; Y = present.

Feature	Type	Shape Profile	Shape Plan	Excavated	Debitage	PPT	Tools	FAR	Fauna	Flotation	^{14}C Median Probability cal B.P. (Beta-)	Trench	Grid	Stratum	Length (cm)	Width (cm)	Thickness (cm)
1	Hearth	Basin	Ovate	X	Y	N	Y	Y	Y	Y	697 (335343)	–	1	I	60	49	13
6	Hearth	Basin	Ovate	X	Y	N	N	Y	N	Y	–	2	1	II/IIA	84	37	11
7	Hearth	Basin	Ovate	X	Y	Y	Y	N	Y	Y	1273 (386881)	2	1	II/IIA	80	46	14
8	Hearth	Basin	Ovate	X	Y	Y	Y	N	N	Y	–	2	1	II/IIA	38	44	7
9	Hearth	Basin	Ovate	X	Y	N	N	N	N	Y	–	2	1	II/IIA	40	30	10
10	Hearth	Basin	Ovate	X	Y	N	Y	N	Y	Y	778 (383160)	2	1	II/IIA	52	50	11
11	Hearth	Circular	Basin	X	N	N	N	Y	N	Y	–	1	1	II/IIA	35	41	11
13	Hearth	Basin	Circular	X	Y	N	Y	N	N	Y	1468 (339421)	2	1	II/IIA	45	52	9
14	Hearth	Basin	Amorphous	X	Y	N	N	N	N	Y	1451 (383161)	2	1	II/IIA	28	45	14
15	Hearth	Basin	Ovate	X	Y	N	N	N	N	Y	–	2	1	II/IIA	62	46	9
17	Hearth	Basin	Amorphous	X	Y	N	N	N	N	Y	–	2	1	II/IIA	42	45	7
19	Hearth	Basin	Ovate	X	N	N	N	N	N	Y	98562 (386889)	–	1	II/IIA	27	25	9
21	Hearth	Basin	Amorphous	X	Y	N	Y	N	N	Y	3604 (342265)	–	1	IIIa2	54	50	16
30	Hearth	Ovate	Shallow Basin	X	Y	N	N	Y	N	Y	890 (386890)	4	–	IV	60	57	10
35	Hearth	Basin	Ovate	X	Y	N	Y	N	N	Y	–	–	1	III/IIIa3	50	23	10
39	Hearth	Basin	Amorphous	X	Y	Y	N	N	N	Y	–	10	–	II/IIA	32	54	5
40	Hearth	Basin	Circular	X	Y	N	Y	Y	N	Y	–	10	–	II/IIA	15	18	8
41	Hearth	Basin	Circular	X	Y	Y	Y	N	N	Y	810 (386892)	10	–	II/IIA	35	38	8
42	Hearth	Basin	Amorphous	X	N	N	Y	N	N	Y	–	10	–	II/IIA	30	30	5
16	Thermal	Basin	Unknown	–	–	–	–	–	–	–	–	2	–	III	–	–	–
23	Thermal	Basin	Amorphous	X	N	N	N	N	N	Y	–	–	1	30–43 cmbs	13	26	13
25	Thermal	Basin	–	–	–	–	–	–	–	–	–	2	–	IIIa1	–	–	–
26	Thermal	–	Unknown	–	Y	–	–	–	–	–	–	4	–	IV	40	50	–
27	Thermal	Shallow basin	Irregular	X	N	N	N	N	N	Y	–	4	–	IV	57	45	4
28	Thermal	Shallow basin	Irregular	X	Y	Y	Y	N	N	N	–	4	–	IV	36	41	8
29	Thermal	–	Unknown	–	–	–	–	Y	–	–	–	4	–	IV	36	60	–
31	Thermal	–	Circular	X	–	–	–	–	–	–	–	4	–		–	–	–
34	Thermal	Irregular	Amorphous	X	Y	N	Y	N	N	Y	1305 (386891)	–	1	IIIa1	32	43	7
36	Thermal	–	Amorphous	–	–	–	–	–	–	–	–	–	–	Surface	80	80	–
37	Thermal	–	–	–	–	–	–	–	–	–	–	–	–	Surface	80	80	–
38	Thermal	Basin	Half-circular	X	Y	Y	Y	N	N	Y	1323 (345541)	–	1	III/Lower III	32	38	29
12	Artifact Conc.	–	Ovate	X	Y	Y	Y	N	N	N	–	2	1	II/IIA	93	73	9
22	Artifact Conc.	–	–	X	N	N	N	N	N	N	–	2	1	IIIa2	13	26	13

FIGURE 36. 26HU2871 Feature 1 in profile.

of variation [c.v.] = 0.19), while the smaller group (<50 cm; *n* = 11) has a mean of 33.4 cm (s.d. = 8.4; c.v. = 0.25). Their corresponding thicknesses seem correlated, as the larger group has a mean of 12.0 cm (s.d. = 2.5; c.v. = 0.20), while the smaller group produced a mean of 8.5 cm (s.d. = 2.6; c.v. = 0.31). Most of the features in both size groups contained flaked stone tools and debitage, while fire-affected rock and faunal remains were found in the six of the larger group; only one of the smaller hearths had fire-affected rock and none had faunal remains. Figures 36 and 37 show examples of both groups.

Indeterminate Thermal Features. Due to the ephemeral nature of these features, the maximum horizontal dimension is only known for nine of the 12 features (see table 31). They tend to be in an intermediate size between the two groups of formal hearths, averaging 49.4 cm (s.d. = 15.4; c.v. = 0.31). Only five were excavated, and of this group three had flaked stone tools and debitage, and none contained fire-affected rock or faunal remains.

Artifact Concentrations. The two artifact concentrations were composed of a cluster of three cobbles, and a concentration of debitage with one Stage 5 biface fragment; both were in subsurface contexts.

Radiocarbon Dates. As outlined above (see Geomorphology), 19 radiocarbon dates were obtained from the site (see table 30). Of the 11 obtained from feature contexts, fully 10 of these dates fall within the Late Archaic Period, with their median probabilities ranging from 1470 to 700 cal B.P. They crosscut all of the feature types with no apparent pattern to their relative ages. They do, however, appear to form a bimodal distribution within the Late Archaic, with one group (*n* = 4) clustering around a mean age of 820 cal B.P. (s.d. = 104; c.v. = 0.13), and the other (*n* = 5) around a mean of 1360 cal B.P. (s.d. = 89; c.v. = 0.07).

The final feature radiocarbon assay produced a median probability date of 3600 cal B.P., falling within the Middle Archaic Period (Feature 21; see table 30). As will be discussed in more detail below, this feature was found relatively

FIGURE 37. 26HU2871 Feature 13 in plan. Note: The feature is 45 cm in maximum dimension and contains flaked stone tools and debitage, but lacks fire-affected rock and faunal remains.

deep in the deposit (Stratum IIIa2) and corresponds well with the Middle Archaic occupation of the site.

Most of the nonfeature dates are significantly earlier (see table 30). One falls within the Late Archaic (1230 cal B.P.), while four others span the Middle and Early Archaic (1880, 3200, 3470, 4480 cal B.P.). The earliest cultural date is 7803 cal B.P. (straddling the boundary between the Paleoarchaic and Post-Mazama periods), while a sediment sample from the paleosol formed on Stratum IIIb produced a noncultural date of 11,920 cal B.P.

Projectile Points. Fifty-six projectile points were recovered from 26HU2871, 43 from Grid 1, and the remaining 13 from other parts of the site (table 32). The Grid 1 sample includes a significant number that predate the ages of the radiocarbon dates, including Great Basin Stemmed (*n* = 9), Humboldt (*n* = 6), Gatecliff (*n* = 5), Elko (*n* = 8), and indeterminate dart fragments (*n* = 3). The Late Archaic Period is represented by a lesser number of items, including Rosegate (*n* = 3) and, perhaps, some indeterminate arrow fragments (*n* = 3). Finally, four indeterminate fragments could not be classified as either darts or arrows.

The remaining projectile points from the site represent a similar mix of time periods and include Great Basin Stemmed (*n* = 3), Humboldt (*n* = 3), Elko (*n* = 4), Rosegate (*n* = 2), and one indeterminate dart.

Component Definition: The following discussion outlines the vertical and horizontal distribution of time-sensitive projectile points, radiocarbon dates, and features, giving special attention to Grid 1 and findings from surrounding areas in Locus C. It is useful to divide Grid 1 into two parts, an eastern exposure (east of E110) and a western exposure (west of E110).

Eastern Exposure Chronostratigraphic Data. Beginning at the eastern exposure, the deepest stratum (IIIb) is an ancient buried soil (see Geomorphology), but includes a Middle Archaic date of 3470 cal B.P. (nonfeature) that likely

TABLE 32
Projectile Point Assemblage from 26HU2871
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic; OBS = obsidian.

Projectile Point	Grid 1									General Site Area Noncomponent			Total
	Early Archaic		Middle Archaic	Middle/ Late Archaic	Late Archaic		Noncomponent						
	OBS	CCS	OBS	OBS	OBS	CCS	OBS	CCS	FGV				
Great Basin Stemmed	–	–	–	–	–	–	8	–	1	2	–	1	12
Humboldt	4	–	–	–	–	–	2	–	–	3	–	–	9
Gatecliff	2	1	1	–	–	–	1	–	–	–	–	–	5
Elko	–	–	2	2	1	–	4	–	–	4	–	–	13
Rosegate	–	–	–	–	1	–	2	–	–	–	2	–	5
Indeterminate dart, fluted	–	–	–	–	–	1	–	–	–	–	–	–	1
Indeterminate dart	–	–	1	–	–	1	1	–	–	1	–	–	4
Indeterminate arrow	–	–	–	–	1	–	2	–	–	–	–	–	3
Indeterminate	1	–	1	–	–	–	2	–	–	–	–	–	4
Total	7	1	5	2	3	2	22	–	1	10	2	1	56

reflects the downward movement of material through turbation or postdepositional site activity. The overlying strata of IIIa3 and IIIa2 include radiocarbon dates of 3200, 3600 (Feature 21), 3650, and 4480 cal B.P., two Elko projectile points, a Gatecliff point, and a single indeterminate dart. The Elko point and first three radiocarbon dates show a continuance of the Middle Archaic occupation observed in Stratum IIIb, but the Gatecliff point and date of 4480 cal B.P. reveal an Early Archaic presence higher in the profile than would be expected.

The Middle Archaic component moves up the profile into Stratum IIIa1, evidenced by a radiocarbon date of 1880 cal B.P. (nonfeature), and an Elko point, but two Late Archaic dates of 1310 cal B.P. (Feature 34) and 1230 cal B.P. (nonfeature) also occur in this stratum in relatively close association with the Middle Archaic material.

No radiocarbon dates were obtained from Strata III within the eastern exposure, but a wide range of projectile types were recovered, including three Great Basin Stemmed points, three Elko, one indeterminate dart, and one Rosegate. This mixture makes no sense stratigraphically, and probably reflects the downhill movement of artifacts from the older, highly reworked sediments located at the western end of the profile.

Things become much more coherent when moving up the profile into Stratum II. This stratum includes multiple Late Archaic radiocarbon dates, all associated with features: 1470 cal B.P. (Feature 13), 1450 cal B.P. (Feature 14), 1270 cal B.P. (Feature 7), 990 cal B.P. (Feature 19), and 790 cal B.P. (Feature 10). A Rosegate point and one indeterminate arrow occur in this stratum too, but one Elko and three indeterminate darts were also found. Additional undated features occur in this stratum (features 7, 8, 9, 12, 15, 17, and 23), and it seems likely that they date to the Late Archaic as well.

The temporally diagnostic assemblage from Stratum I in Locus C is limited to one Great Basin Stemmed point.

*Eastern Exposure Componen*ts. Everything from Strata IIIb, IIIa3, and IIIa2 is considered Middle Archaic. While Stratum IIIa2 does contain a minimal amount of Early Archaic material mixed in, we do not think it is enough to seriously compromise the integrity of the component.

Stratum IIIa1 is a mixture of Middle and Late Archaic material and, therefore, it is assigned to a mixed Middle/Late Archaic component. Stratum III has a mixture of material from multiple time periods so it is assigned to the noncomponent category. Stratum II is mostly Late Archaic, but includes some Middle Archaic material as well. As a result, the Late Archaic component includes all the features and excavation units from Stratum II, except N104/E100, N104/E101, N103/E100, and N103/E105, which are assigned to the Middle/Late Archaic component. Finally, all other material from Stratum I and the surface belongs in the noncomponent category.

Western Exposure Chronostratigraphic Data. The deeply turbated Strata IIIb, Lower III, and III within the western exposure are hopelessly mixed. There is a Great Basin Stemmed projectile point and a possibly contemporaneous radiocarbon date of 7800 cal B.P. (nonfeature) in Stratum IIIb, but it also contains a Gatecliff point. Stratum Lower III also has a Great Basin Stemmed projectile point, but a radiocarbon date of 1320 cal B.P. from Feature 38. Finally, Stratum III and mixed deposits of Stratum III/Lower III retain this high degree of mixture, including two Great Basin Stemmed points, two Humboldt, an Elko, one Rosegate, and an indeterminate arrow.

The set of temporal indicators from Stratum II includes two Humboldt and two Gatecliff points, both dating to the Early Archaic. There is also a Great Basin Stemmed and an indeterminate arrow point, but they were found within the northwest and northeast margins of the exposure.

Early Archaic materials extend up into Stratum I, which includes two Humboldt points and one Gatecliff; the stratum also includes a Late Archaic radiocarbon date of 700 cal B.P. (Feature 1), which goes along with the other Late Archaic features at the site. Features 39 and 40, which are undated, are probably also associated with this group.

Western Exposure Components. The western exposure includes an Early Archaic component, a series of features dating to the Late Archaic (features 1, 39, and 40), and a significant amount of chronologically mixed deposits. The Early Archaic component includes all materials from Strata II and I, except for peripheral findings from units N104/E100, N104/E101, N103/E100, and N103/E105, which are mixed, noncomponent proveniences.

Other Locations. Excavations outside Locus C largely focused on features discovered during backhoe trenching. Most of the features, including features 5, 6, 8, 41, and 42, are assigned to the Late Archaic due to their stratigraphic setting and morphology. All other collections are assigned to the noncomponent category, due to uncertain age or lack of stratigraphic integrity.

Assemblage

The artifact assemblage from 26HU2871 is dominated by flaked stone tools and debitage, and this is true for all time periods represented at the site (table 33). In fact, ground and battered stone implements are completely absent from the component areas, and are represented in only noncomponent areas by one handstone, two millingstones, five battered cobbles, and one miscellaneous ground stone item. Only three bone tools were found (one Late Archaic, two noncomponent), further testifying to the rather narrow range of activities that occurred at this location.

Early Archaic Component: The Early Archaic flaked stone assemblage includes relatively equal amounts of bifaces (30%) and flake tools (26%), with lesser but significant frequencies of projectile points (17%), formed flake tools (15%), and cores (13%). Most of the projectile points (88%) are made from obsidian (see table 32), but this frequency drops within the other tool classes (formed flake tools, 71%; bifaces, 57%; flake tools, 42%; cores 0%), with the less formal tools made more often from CCS (table

TABLE 33
Artifact Inventory from 26HU2871

Type	Early Archaic	Middle Archaic	Middle/ Late Archaic	Late Archaic	Noncom-ponent	Total
Flaked stone						
Projectile point	8	5	2	5	36	56
Biface	14	13	17	40	132	216
Formed flake tool	7	5	3	6	50	71
Flake tool	12	20	26	26	107	191
Core tool	–	–	–	2	–	2
Core	6	6	10	9	37	68
Debitage	3939	3678	4214	8240	30,020	50,091
Ground stone						
Millingstone	–	–	–	–	2	2
Handstone	–	–	–	–	1	1
Battered cobble	–	–	–	–	5	5
Misc. ground stone	–	–	–	–	1	1
Miscellaneous prehistoric items						
Modified bone	–	–	–	1	2	3
Faunal remains						
Bone	45	78	52	20	409	604
Shell	–	–	–	–	3	3
Total	4031	3805	4324	8349	30,805	51,314

34). Debitage is intermediate along this trajectory, with 58% composed of obsidian, 39% CCS, and 2% made from fine-grained volcanic and other indeterminate stone (table 35).

Biface stages form a bimodal distribution with regard to material type (table 34), with all the obsidian being either Stage 4 or 5, and all the CCS specimens being Stage 3 or earlier. The formed flake tools show less variability, with both material types made from interior or cortical flakes. This is also the case for the simple flake tools. All the CCS cores and have multidirectional flake removals.

Only 1% of the Early Archaic debitage was analyzed (table 35). The obsidian sample is dominated by biface thinning (78%), followed by limited amounts of core reduction (9%) and tool finishing/resharpening (13%) debris. A more even mix of flake types are found within the CCS sample, including core reduction (31%), biface thinning (38%), and tool finishing/resharpening (31%) flakes.

Middle Archaic Component: Flake tools (41%) and bifaces (27%) continue to be the most abundant artifacts within the Middle Archaic component, followed by near-equal amounts of projectile points (10%), formed flake tools (10%), and cores (12%). All of the projectile points are made from obsidian (see table 32), but the relative frequency of obsidian specimens drops among the bifaces (54%), flake tools (50%), and formed flake tools (20%), and is completely replaced by CCS among the cores (table 34). Debitage is midway along this trajectory, with equal amounts of obsidian (47%) and CCS (47%), and only 6% made from fine-grained volcanic and other indeterminate stone (table 35).

TABLE 34
Flaked Stone Tool Inventory from 26HU2871
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic.

Type	Early Archaic		Middle Archaic			Middle/Late Archaic			Late Archaic			Noncomponent			Total
	Obsidian	CCS	Obsidian	CCS	FGV	Obsidian	CCS	FGV	Obsidian	CCS	FGV	Obsidian	CCS	FGV	
Biface															
Stage 1	–	1	–	–	–	–	–	–	–	–	–	–	4	–	5
Stage 2	–	1	–	2	–	–	3	–	–	7	–	2	17	–	32
Stage 3	–	3	1	1	–	2	–	–	1	7	–	8	16	1	40
Stage 4	3	–	–	1	1	2	–	–	1	10	–	10	22	2	52
Stage 5	5	–	4	–	–	2	1	–	4	6	–	25	9	–	56
Indeterminate stage	–	1	2	1	–	5	2	–	2	2	–	11	5	–	31
Subtotal	8	6	7	5	1	11	6	–	8	32	–	56	73	3	216
Formed flake tool															
Reworked biface blank	–	–	–	–	–	–	–	–	–	1	–	–	1	–	2
Biface-reduction flake blank	–	–	–	–	–	–	–	–	–	1	–	8	4	1	14
Interior flake blank	2	2	–	2	–	–	2	–	1	3	–	8	10	1	31
Cortical flake blank	2	–	1	1	1	–	1	–	–	–	–	–	5	–	11
Flake blank	–	–	–	–	–	–	–	–	–	–	–	1	1	–	2
Chunk blank	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Cobble blank	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Indeterminate blank type	1	–	–	–	–	–	–	–	–	–	–	2	4	2	9
Subtotal	5	2	1	3	1	–	3	–	1	5	–	19	27	4	71
Average number of modified edges	1.6	1.5	2.0	1.3	1.0	–	1.3	–	1.0	1.2	–	2.1	1.9	2.8	1.8
Flake tool															
Reworked biface blank	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Biface-reduction flake blank	–	–	1	1	–	3	4	–	2	6	–	15	8	1	41
Interior flake blank	2	6	9	4	–	2	9	1	–	13	2	20	25	2	95
Cortical flake blank	1	1	–	4	–	3	2	–	–	–	–	8	4	–	23
Flake blank	1	–	–	–	–	–	–	–	–	–	–	3	–	–	4

TABLE 34 (*Continued*)

Type	Early Archaic		Middle Archaic			Middle/Late Archaic			Late Archaic			Noncomponent			Total
	Obsidian	CCS	Obsidian	CCS	FGV	Obsidian	CCS	FGV	Obsidian	CCS	FGV	Obsidian	CCS	FGV	
Indeterminate blank type	1	–	–	1	–	2	–	–	–	3	–	9	10	1	27
Subtotal	5	7	10	10	–	10	15	1	2	22	2	55	48	4	191
Average number of modified edges	2.0	1.7	1.1	1.1	–	1.6	1.5	2.0	2.5	1.4	1.0	1.7	1.4	1.3	1.5
Core Tool															
Interior flake blank	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1
Cortical flake blank	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1
Subtotal	–	–	–	–	–	–	–	–	–	2	–	–	–	–	2
Core															
Multidirectional	–	6	–	5	–	1	5	–	–	7	–	1	29	1	55
Unidirectional	–	–	–	1	–	1	1	–	–	1	–	–	6	–	10
Bipolar	–	–	–	–	–	2	–	–	–	1	–	–	–	–	3
Subtotal	–	6	–	6	–	4	6	–	–	9	–	1	35	1	68
Total	18	21	18	24	2	25	30	1	11	70	2	131	183	12	548

TABLE 35
Debitage Analysis from 26HU2871
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic; Indet. = indeterminate.

Type	Early Archaic				Middle Archaic				Middle/Late Archaic				Late Archaic				Non-component				Total
	Obsidian	CCS	FGV	Indet.	Obsidian	CCS	FGV	Indet.	Obsidian	CCS	FGV	Indet.	Obsidian	CCS	FGV	Indet.	Obsidian	CCS	FGV	Indet.	
Diagnostic debitage																					
Core reduction	1	5	–	–	1	4	–	–	6	6	–	–	–	16	–	1	9	57	–	1	107
Core reduction/flake tool production	1	–	–	–	–	1	–	–	1	2	–	–	–	3	–	–	6	13	–	–	27
Biface production	18	6	–	–	9	15	–	–	5	20	1	–	5	55	–	1	88	132	2	1	358
Tool finishing/resharpening	3	5	–	–	8	1	–	–	2	4	–	–	3	11	–	–	54	17	–	–	108
Nondiagnostic debitage																					
General percussion	35	16	–	–	36	37	–	–	38	49	–	1	21	124	–	–	206	219	4	2	788
Indeterminate type	51	49	3	–	36	40	2	2	50	59	–	3	18	183	1	–	248	448	11	5	1209
Not analyzed	2188	1463	46	49	1636	1648	63	139	1711	2123	20	113	905	6791	25	77	11,237	16,547	292	421	47,494
Total	2297	1544	49	49	1726	1746	65	141	1813	2263	21	117	952	7183	26	79	11,848	17,433	309	430	50,091

All the projectile points are broken, consisting mainly of proximal fragments. Five of the obsidian bifaces could be classified according to reduction stage, with four (80%) assigned to Stage 5 and one (20%) to Stage 3 (see table 34). The CCS sample shows an earlier range of reduction stages, with 50% (*n* = 2) classified as Stage 2 and the other two falling in the Stage 3 and Stage 4 categories. The single felsite specimen is also a Stage 4. The small sample of formed-flake tools is made from either cortical or interior flakes across all material types. The obsidian simple flake tools are made from interior (*n* = 9) and biface-thinning (*n* = 1) flakes, while the CCS sample includes cortical (*n* = 4), interior (*n* = 4), and biface-thinning (*n* = 1) flakes. Finally, most of the cores (all CCS) have multidirectional flake removals (*n* = 5), with only one exhibiting unidirectional flaking.

Only 5% of the debitage was analyzed, and diagnostic attributes were obtained from only 1% of the assemblage (see table 35). Almost all the obsidian sample is composed of biface thinning (*n* = 9; 50%) and tool finishing/resharpening flakes (*n* = 8; 44%), while a slightly earlier reduction profile is exhibited by the CCS sample, with significant amounts of core reduction (*n* = 5; 24%) and biface-thinning (*n* = 15; 71%) flakes, but little in the way of tool finishing/resharpening flakes (*n* = 1; 5%).

Middle/Late Archaic Mixed Component: The mixed component of Middle and Late Archaic material shows a continued dominance of flake tools (45%) and bifaces (29%), followed by cores (17%), but much lower frequencies of projectile points (3%) and formed flake tools (5%). Both of the projectile points (100%) are made from obsidian (see table 32), but this frequency drops within the other tool classes (bifaces, 65%; cores, 40%; flake tools, 38%; formed flake tools, 0%; see table 34). Debitage shows a slight increase in CCS relative to the preceding time periods (53%), followed by obsidian (43%), fine-grained volcanic, and indeterminate stone (3%; see table 35).

Two projectile points were recovered from this component, both near-complete Elko-series specimens. The six diagnostic obsidian bifaces are equally distributed among stages 3, 4, and 5 (see table 34), while the CCS sample shows a dominance of Stage 2 forms (*n* = 3; 75%), followed by a single (25%) Stage 5 specimen. Formed flake tools are represented by only three CCS items made from cortical and interior flakes. Simple obsidian flake tools are made from cortical (*n* = 3; 38%); interior (*n* = 2; 25%), and biface-thinning (*n* = 3; 38%) flakes. The CCS simple flake tools are made from the same type of flake blanks, but with a higher proportion of interior flakes (*n* = 9; 60%) than biface-thinning (*n* = 4; 27%) or cortical (*n* = 2; 13%) flakes. Finally, the four obsidian cores include two bipolar specimens, and single examples of unidirectional and multidirectional forms. The CCS core sample is limited to the latter two forms, with multidirectional (83%) dominating the assemblage.

Only 5% of the Middle/Late Archaic debitage was analyzed, resulting in a sample of 47 flakes with diagnostic attributes (see table 35). The obsidian sample reflects a rather wide range of production activity, including significant quantities of core reduction (50%), followed by lesser frequencies of biface-thinning (36%) and tool finishing/resharpening (14%) debris. The CCS sample shows a higher proportion of biface-thinning flakes (62%), followed by core reduction (24%) and tool finishing/resharpening (12%) flakes.

Late Archaic Component: Bifaces (45%) and flake tools (30%) continue to be the most abundant artifacts within the Late Archaic component, followed by cores (10%), formed flake tools (7%), projectile points (6%), and core tools (2%). Major changes in material type occur relative to the preceding time periods, as the frequency of obsidian drops across all tool classes (projectile points, 60%; bifaces, 20%; formed flake tools, 17%; flake tools, 8%; and cores/core tools, 0%; see table 34). This is also the case for debitage, as CCS makes up fully 87% of the assemblage, while obsidian drops to only 12%, followed by a 2% contribution from fine-grained volcanic and other indeterminate stone (see table 35).

Projectile points include three obsidian and two CCS artifacts and are represented by both complete specimens and proximal fragments. Obsidian bifaces are dominated by Stage 5 forms (67%), followed by Stage 4 (17%) and Stage 3 (17%). A more even mix of stages is found within the CCS sample, with good representation from Stage 2 (23%), Stage 3 (23%), Stage 4 (33%), and Stage 5 (20%) forms. The single obsidian formed flake tool is made from an interior flake, while the majority of the CCS sample is also made from interior flakes (60%), followed by a biface-thinning flake (20%) and a reworked biface blank (20%). Both of the simple obsidian flake tools are made from biface-thinning flakes. This is also the case for six (32%) of the CCS flake tools, with the other 13 (68%) made from interior flake blanks. Two additional flake tools were made from fine-grained volcanic interior flakes. All the cores and core tools were made from CCS. The two core tools are made from interior and cortical flake blanks. Most of the cores have multidirectional flake removals (n = 7; 78%), while one has unidirectional flake removals (11%) and the other (11%) is a bipolar form.

About 5% of the Late Archaic debitage was analyzed, resulting in a sample of 95 flakes with diagnostic attributes. The obsidian sample is quite small (n = 9), consisting of biface thinning (n = 5) and tool finishing/resharpening flakes (n = 3). The CCS sample is much larger (n = 85) and shows a fuller range of reduction activity, including core reduction (22%), biface-thinning (65%), and tool finishing/resharpening (13%) flakes.

Noncomponent Areas: A broad mixture of time periods is represented in the noncomponent materials. Judging from the projectile points, they reflect activities dating to the Paleoarchaic, Early Archaic, Middle Archaic, and Late Archaic periods (see table 32). Although flaked stone tools and debitage continue to dominate the overall assemblage, there are a few ground (n = 4) and battered (n = 5) stone implements, as well as three pieces of modified bone (see table 33). The flaked stone assemblage is dominated by bifaces (37%) and flake tools (30%), followed by lesser frequencies of formed flake tools (14%), projectile points (10%), and cores (10%). Most of the projectile points (91%) are made from obsidian, but this frequency drops within the other tool classes (flake tools, 51%; bifaces, 42%; formed flake tools, 38%; cores, 3%), with the less formal tools made more often made from CCS. Debitage includes 58% CCS, 39% obsidian, and 2% made from fine-grained volcanic and other indeterminate stone.

Obsidian Source Profiles

Obsidian source data was generated from a sample of bifaces and projectile points (table 36). A wide range of types is represented within the sample, including 13 geographically discrete sources and one of unknown origin. Projectile points show the greatest range, represented by 12 sources, with a dominant presence of Mount Majuba (42%), followed by lower frequencies of Massacre Lake/Guano Valley (17%), Double H (9%), and Craine Creek (7%), and less than 5% from the other eight sources. Bifaces are represented by seven sources, five shared with the projectile points and two new ones. Similar to the projectile points, the most common sources include Mount Majuba (53%) and Massacre Lake/Guano Valley (13%), and only single examples from the others. Only a small proportion of the sample came from single-component areas, so not much can be said about change through time. This issue will be dealt with in greater detail in Summary and Conclusions, where we present a projectwide analysis of time-sensitive projectile points and other artifacts from single-component contexts.

Subsistence Remains

A limited number of subsistence remains was recovered from the site. These include vertebrate faunal remains.

TABLE 36
Obsidian Sources from 26HU2871

Type	Early Archaic	Middle Archaic	Middle/ Late Archaic	Late Archaic	Noncomponent	Total
Projectile point						
Beatys Butte	–	–	–	–	1	1
Bordwell Spring	–	–	–	–	1	1
Buffalo Hills	–	–	1	1	–	2
Craine Creek	–	1	–	–	2	3
Double H	–	–	–	–	4	4
Fox Mountain	1	–	–	–	1	2
Hawks Valley	–	1	–	–	–	1
Massacre Lake/Guano Valley	2	–	–	–	5	7
Mount Majuba	1	2	1	2	12	18
Paradise Valley	1	1	–	–	–	2
Seven Troughs Range	–	–	–	–	1	1
Unknown	–	–	–	–	1	1
Biface						
Buffalo Hills	–	–	–	–	1	1
Double H	–	–	–	–	1	1
Fox Mountain	–	–	–	–	1	1
Massacre Lake/Guano Valley	–	1	–	–	1	2
Mount Majuba	1	1	–	3	3	8
Nut Mountain	–	–	–	–	1	1
Pinto Peak	–	–	–	–	1	1
Total	6	7	2	6	37	58

Faunal Remains

Only 194 of the 603 animal bone fragments recovered from the site were found within component areas; the other 409 were found in mixed/noncomponent portions of the deposit (table 37). When comparing artiodactyls to rabbits, we find that artiodactyls are dominant in all four component areas (Early Archaic 17:0; Middle Archaic 31:3; Middle/Late Archaic 9:1; Late Archaic 13:0). When comparing the less diagnostic Large Mammal group (deer sized and larger) to the Medium Mammal group (includes jack rabbit- and coyote-sized animals), the latter make up a slightly higher contribution, but the number of specimens is quite low (there are only 24 specimens from all four time periods).

Site Summary

Site 26HU2871 is a large accumulation of prehistoric artifacts located on a low-gradient pediment adjacent to an old spring. Several time-sensitive projectile points and radiocarbon dates show that multiple periods of occupation are represented at the site, including materials dating to the Paleoarchaic, Early Archaic, Middle Archaic, and Late Archaic periods. Probably due to the presence of the spring, much of this material overlaps in space, making it impossible to separate out single-component assemblages across the surface of the site. Vertical stratigraphy does exist, and has helped alleviate this problem to a limited degree, but much of the buried material is also found in

TABLE 37
Faunal Remains from 26HU2871

Common Name	Taxon	Early Archaic		Middle Archaic		Middle/Late Archaic		Late Archaic		Noncomponent		Total	
		Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
Bird													
Falcon/caracara	Falconiformes	–	–	1	0.04	–	–	–	–	–	–	1	0.04
Mammal													
Deer, mule	*Odocoileus hemionus*	–	–	–	–	–	–	–	–	2	11.33	2	11.33
Artiodactyl, indeterminate	Artiodactyla, indeterminate	17	2.59	31	4.50	9	1.34	13	1.54	64	14.72	134	24.69
Dog/wolf/coyote/jackal/fox	Canidae	–	–	–	–	–	–	–	–	1	0.37	1	0.37
Carnivore, indeterminate	Carnivora, indeterminate	–	–	2	0.16	1	0.06	2	0.33	1	0.10	6	0.65
Hare, black–tailed	*Lepus californicus*	–	–	3	0.22	1	0.10	–	–	19	5.41	23	5.73
Rabbit, cottontail	*Sylvilagus* spp.	–	–	–	–	–	–	–	–	1	0.06	1	0.06
Mouse, little pocket	*Perognathus longimembris*	–	–	–	–	–	–	–	–	3	0.18	3	0.18
Pocket gopher, Bottae's	*Thomomys bottae*	–	–	–	–	–	–	–	–	1	0.02	1	0.02
Squirrel/chipmunk	Sciuridae	3	0.30	11	0.70	7	0.66	–	–	65	4.22	86	5.88
Rodent, indeterminate	Rodentia, indeterminate	–	–	8	0.26	7	0.13	–	–	23	0.67	38	1.06
Mammal, large	Mammalia, large	3	2.00	3	1.68	3	1.92	2	0.71	53	45.55	64	51.86
Mammal, Medium	Mammalia, Medium	9	1.68	–	–	4	1.17	–	–	30	5.08	43	7.93
Mammal, small	Mammalia, small	–	–	7	0.12	5	0.09	1	0.04	32	1.38	45	1.63
Mammal, indeterminate	Mammalia, indeterminate	12	0.94	11	0.26	14	2.75	2	0.16	114	8.38	153	12.49
Reptile													
Lizard, horned	*Phrynosoma* spp.	1	0.02	1	0.02	1	0.01	–	–	–	–	3	0.05
Total		45	7.53	78	7.96	52	8.23	20	2.78	409	97.47	604	123.97

mixed contexts. Despite these problems related to repeated occupation and overprinting, we were able to isolate single-component assemblages dating to the Early, Middle, and Late Archaic periods.

Although we could not isolate a single-component assemblage dating to the Paleoarchaic Period, it is represented by a significant number of Great Basin Stemmed projectile points, which will be discussed in more detail in Summary and Conclusions.

Both the Early and Middle Archaic components are dominated by flaked stone tools and debitage, and essentially lack ground and battered stone tools. The flaked stone assemblages are rather diverse, however, represented by projectile points, bifaces, formed flake tools, flake tools, cores, and debitage. Obsidian from a variety of sources dominates the projectile points, but its frequency vis-à-vis the more local CCS material goes down with decreasing artifact formality, with relatively low frequencies found among the flake tools and completely absent among the cores. Debitage is midway along this trajectory, with near-equal amounts of obsidian and CCS. This general profile of artifacts and material types indicates that the site was occupied by people who were primarily interested in producing and maintaining their hunting/butchering toolkits, with a strong emphasis placed on the use of obsidian from distant quarries. The focus on hunting is supported to a limited degree by the small faunal assemblages recovered from these two components, which show a dominance of artiodactyls.

The Late Archaic occupation is completely different from those preceding it, in two main dimensions. First, it is dominated by thermal features, including more than 20 assigned to the Late Archaic component. Many are formal hearths, reflecting multiple-use episodes, while others are more ephemeral in nature, reflecting short-term use. The presence of faunal remains in many of them shows that they were used for processing animals. Because little attention was given to the collection of flotation samples during the field phase, little can be said about other subsistence items consumed at the site.

Despite the large number of thermal features, the artifact assemblage remains dominated by flaked stone tools (i.e., one might expect an increase in milling gear, given the more intensive use of the site). The flaked stone assemblage does differ from the preceding occupations, however, by significant decreases in the use of obsidian. Using bifaces as an example, 58% of the Early and Middle Archaic sample is made from obsidian, while this drops to 20% within the Late Archaic assemblage. Debitage is even more extreme, with obsidian making up 55% of the Early and Middle Archaic assemblages, but only 12% of the Late Archaic sample. These findings indicate that the Late Archaic foraging range was smaller than those that came earlier, leading people to more intensively use the local area. This included a greater emphasis on CCS toolstone and perhaps local food resources, the latter reflected by the explosion in the frequency of thermal features.

26HU3118 SITE REPORT

Site 26HU3118 is a large (600 × 550 m) accumulation of flaked stone tools and debitage, ground and battered stone implements, and several clusters of fire-affected rock (figs. 38, 39). It occupies a series of sand dunes that overlay the alluvial fan and floodplain at the base of the Kamma Mountains. Most of these materials are found in a series of loci (A–N; fig. 39). All of these concentrations also include clusters of fire-affected rock, although the latter are also found outside the loci in more isolated contexts (fig. 39). Local vegetation is composed of diffuse to dense concentrations of greasewood with occasional clusters of saltbush and desert bunch grasses, including ricegrass.

Field Methods

Fieldwork began with surface reconnaissance, collection of formal tools, and mapping, all of which were used to delineate the loci and features. To develop a better understanding of

FIGURE 38. 26HU3118 site overview of preexcavated area of backhoe Trench 21.

the subsurface structure and composition of the site, 19 backhoe trenches (1–3; 5–6; 8–21) were excavated, focusing largely on the concentrations and features. Based on the trench findings, multiple test units (TUs) were used to further explore these areas, as well as feature areas not sampled by the backhoe trenches (fig. 39, Detail maps 1–4).

The most promising locations discovered by the backhoe trenches and test units were then intensively surface collected and excavated within a series of grids. Six grids were used: Grid 1 in Locus A (fig. 40), Grid 2 in Locus B, Grid 3 in Locus G, Grid 4 in Locus C (fig. 41), Grid 5 in Locus M, and Grid 6, also in Locus M (see also fig. 39: Detail Maps 1, 2, 6, 7, and 9). This effort resulted in the excavation of 113 test units for a total of 98.58 cubic meters of hand-excavated deposit (table 38). A summary of backhoe trenches is provided in table 39.

Site Structure and Chronology

The structural characteristics of the site are elucidated through description of the stratigraphic profiles exposed within the grid excavations, key backhoe trenches, and the multiple features encountered. We then review the distribution of time-sensitive projectile points, radiocarbon dates, and beads, which, when combined with the features and sediment stratigraphy, are used to define a series of single-component areas for the site.

Geomorphology: The site occupies a series of localized dune forms and a dissected sandsheet at the southern edge of the Sulphur Springs

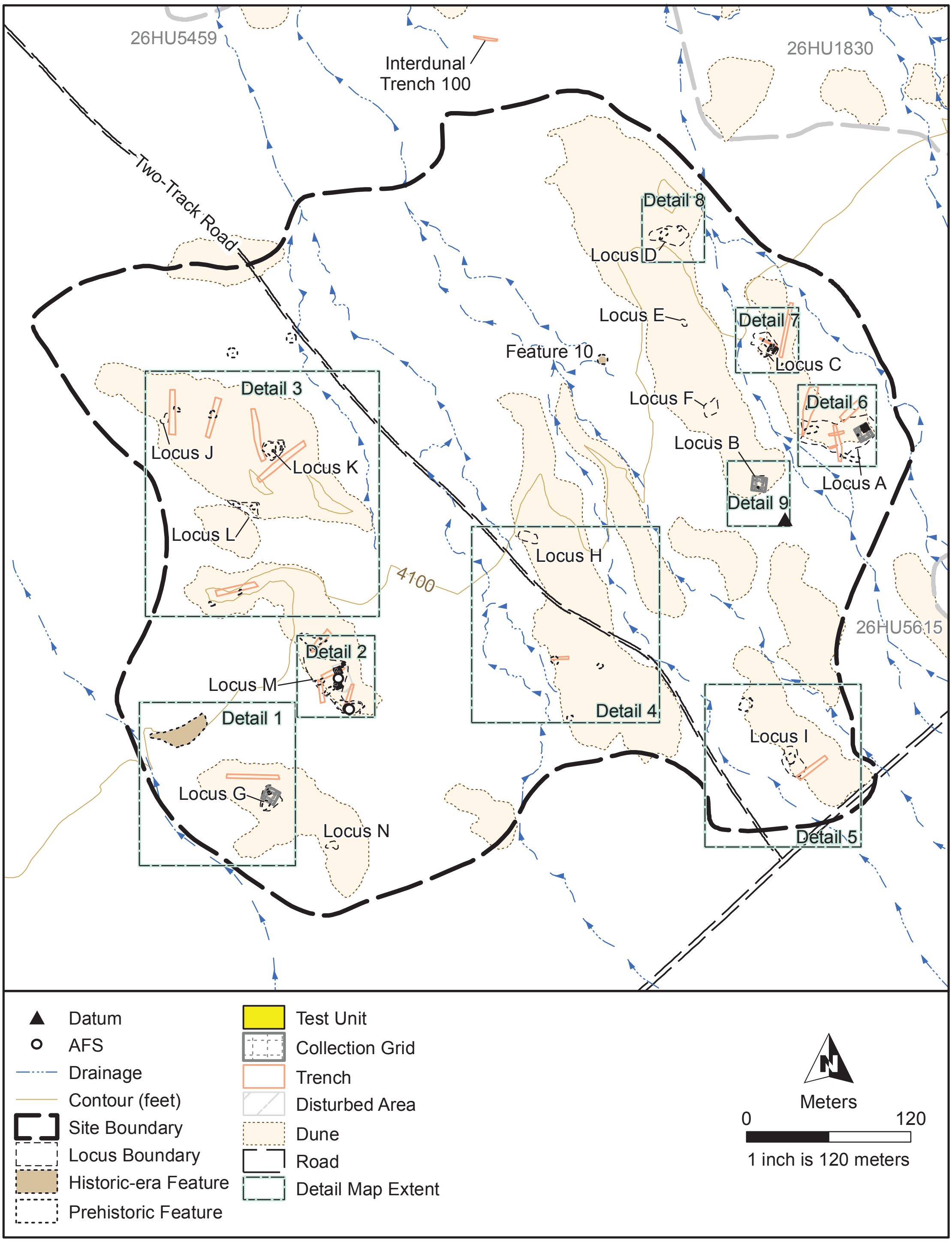


FIGURE 39. 26HU3118 sketch map.

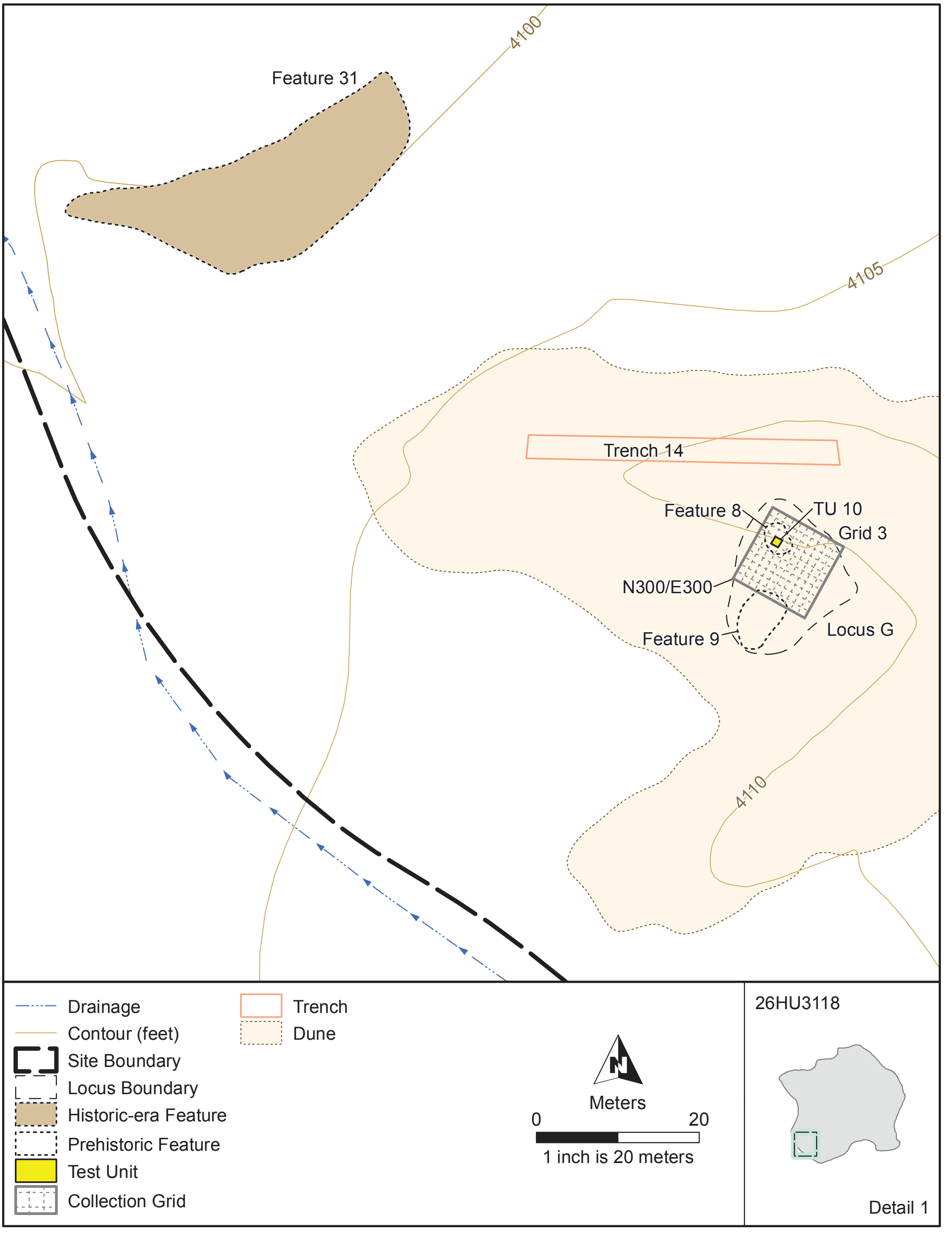


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 1.

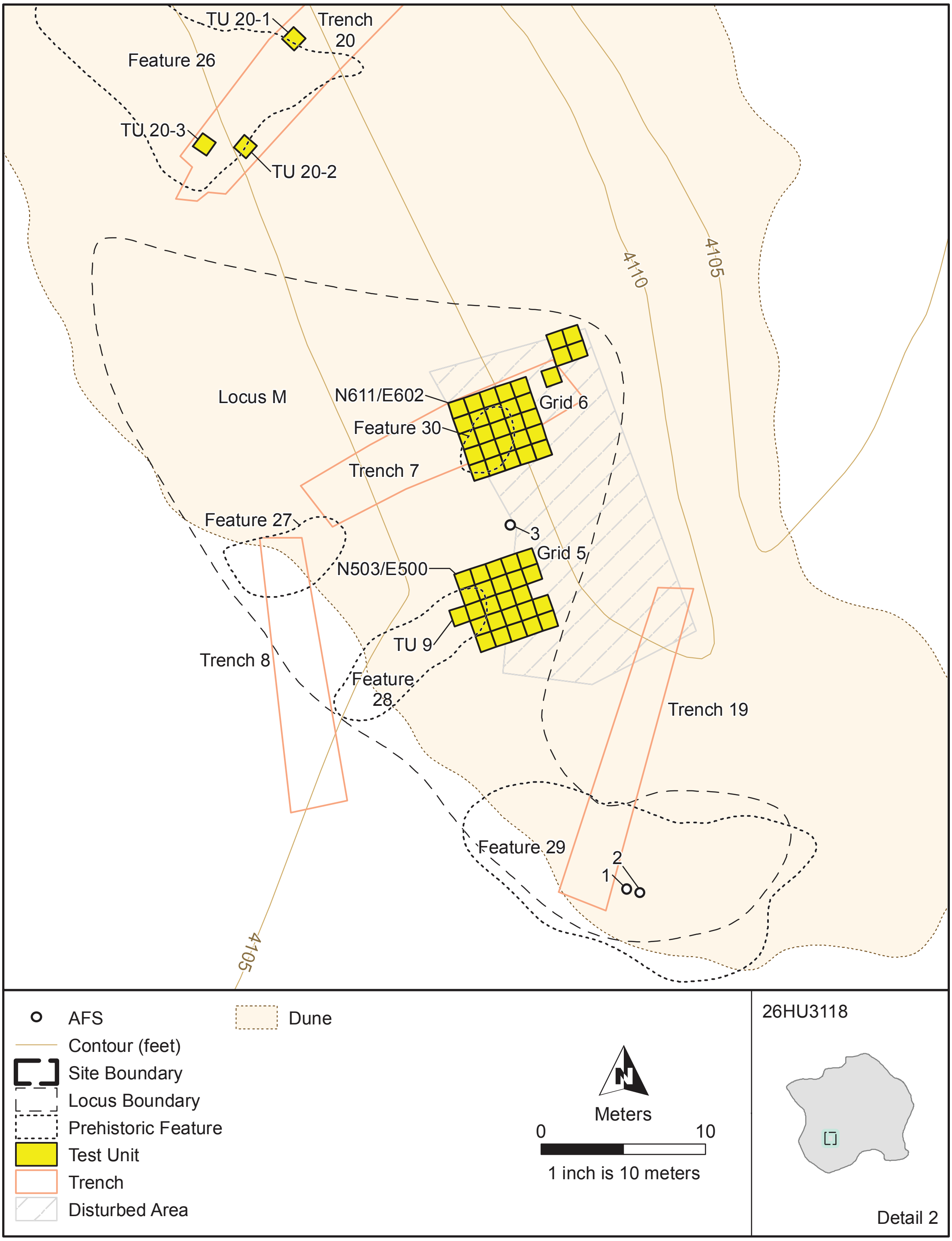


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 2.

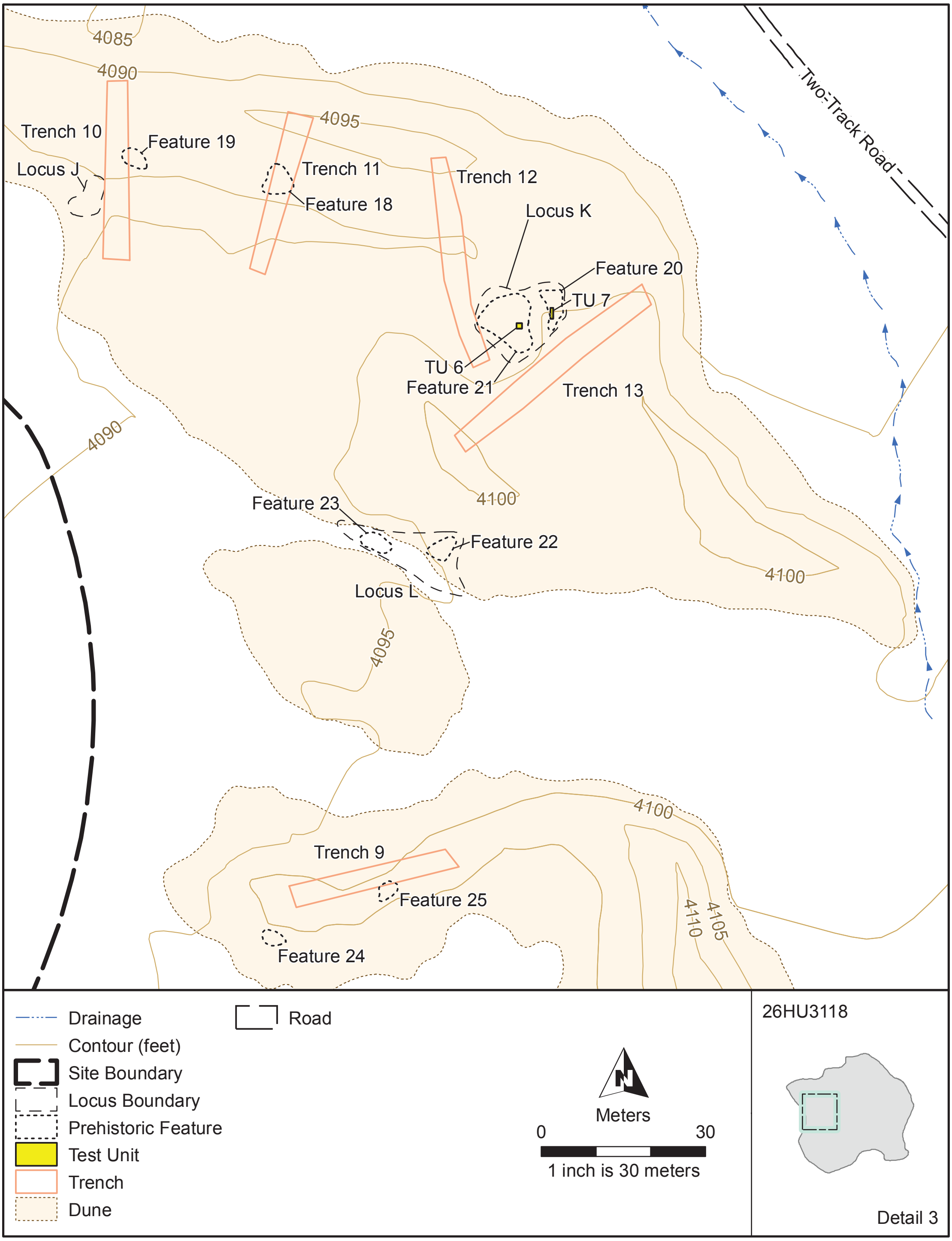


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 3.

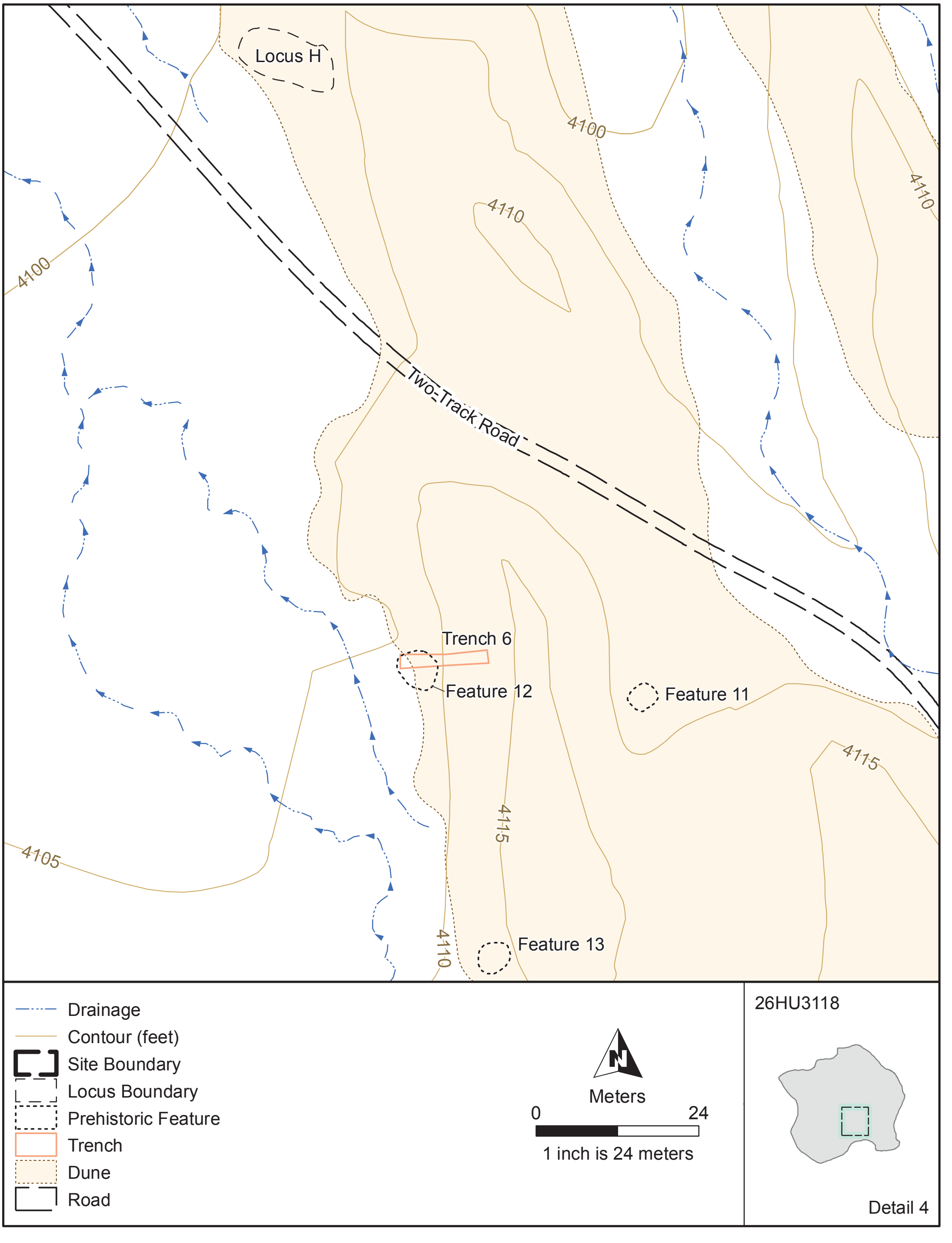


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 4.

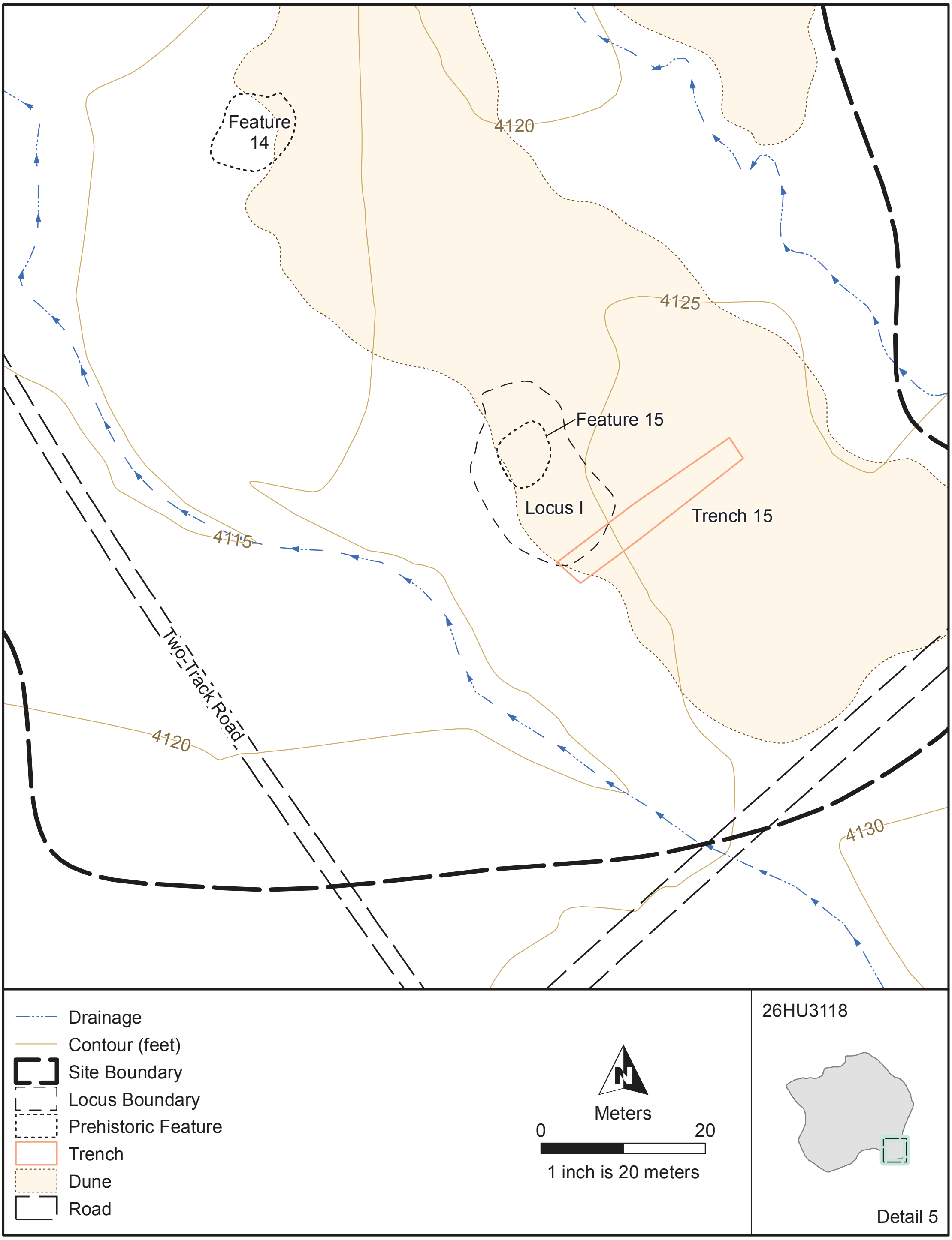


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 5.

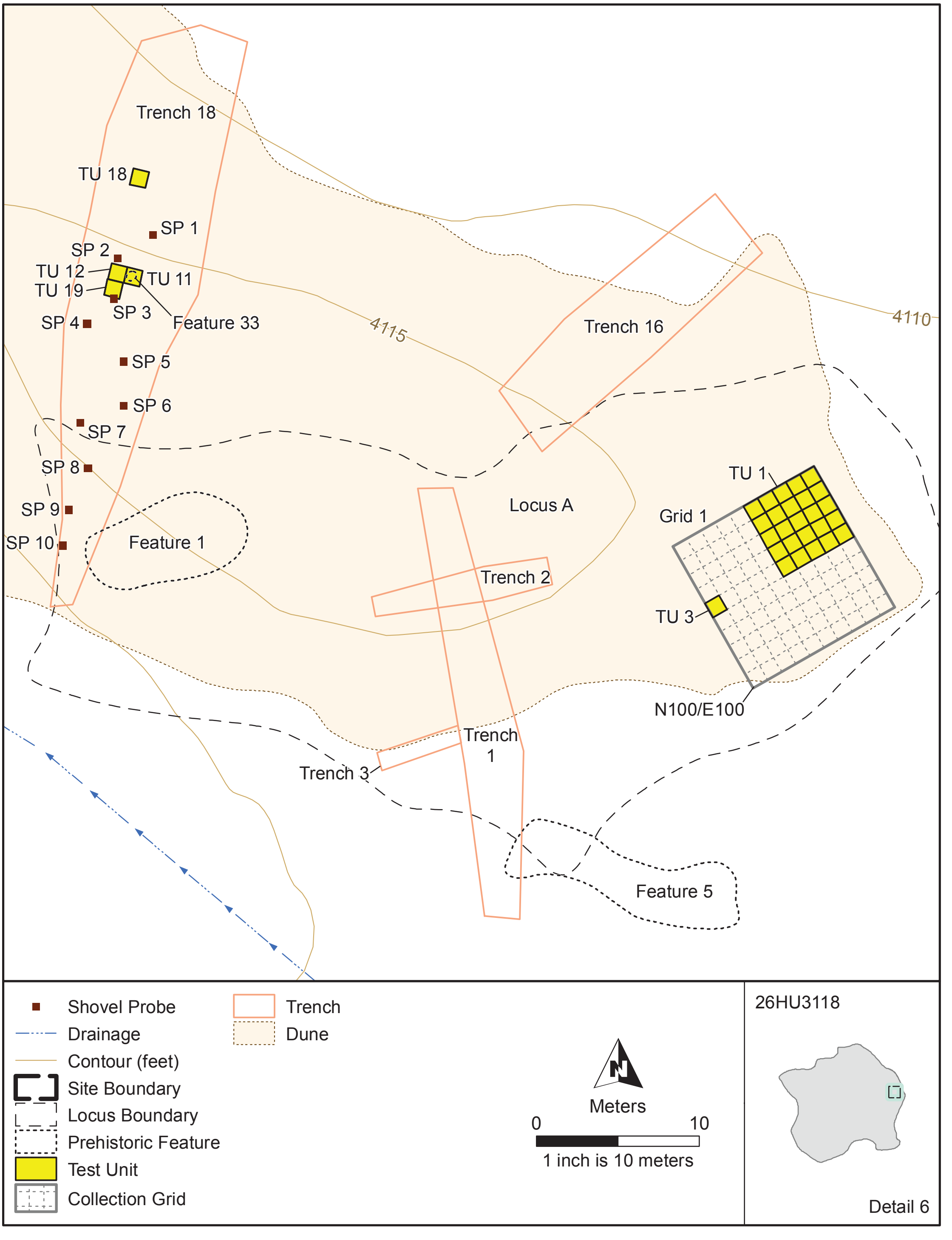


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 6.

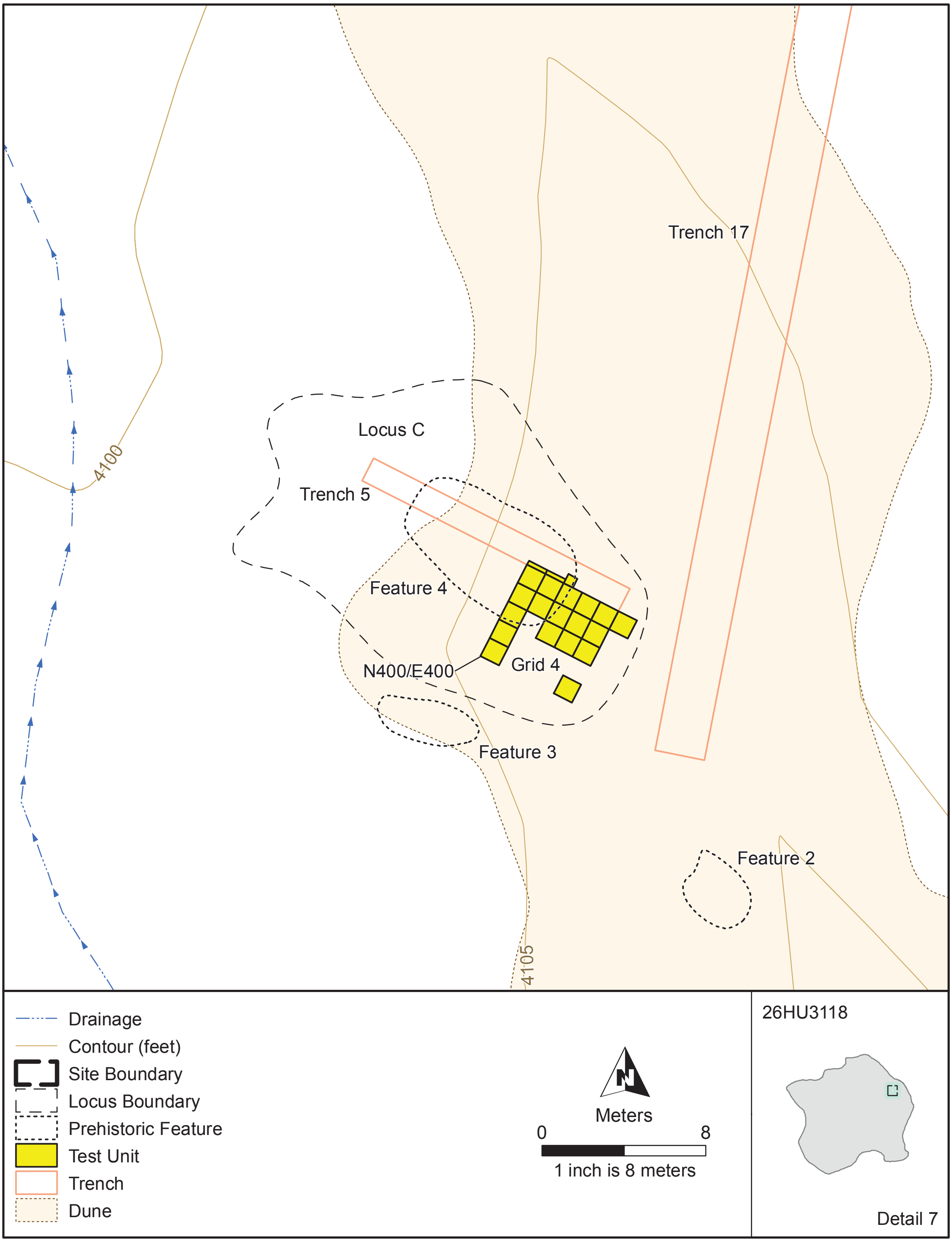


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 7.

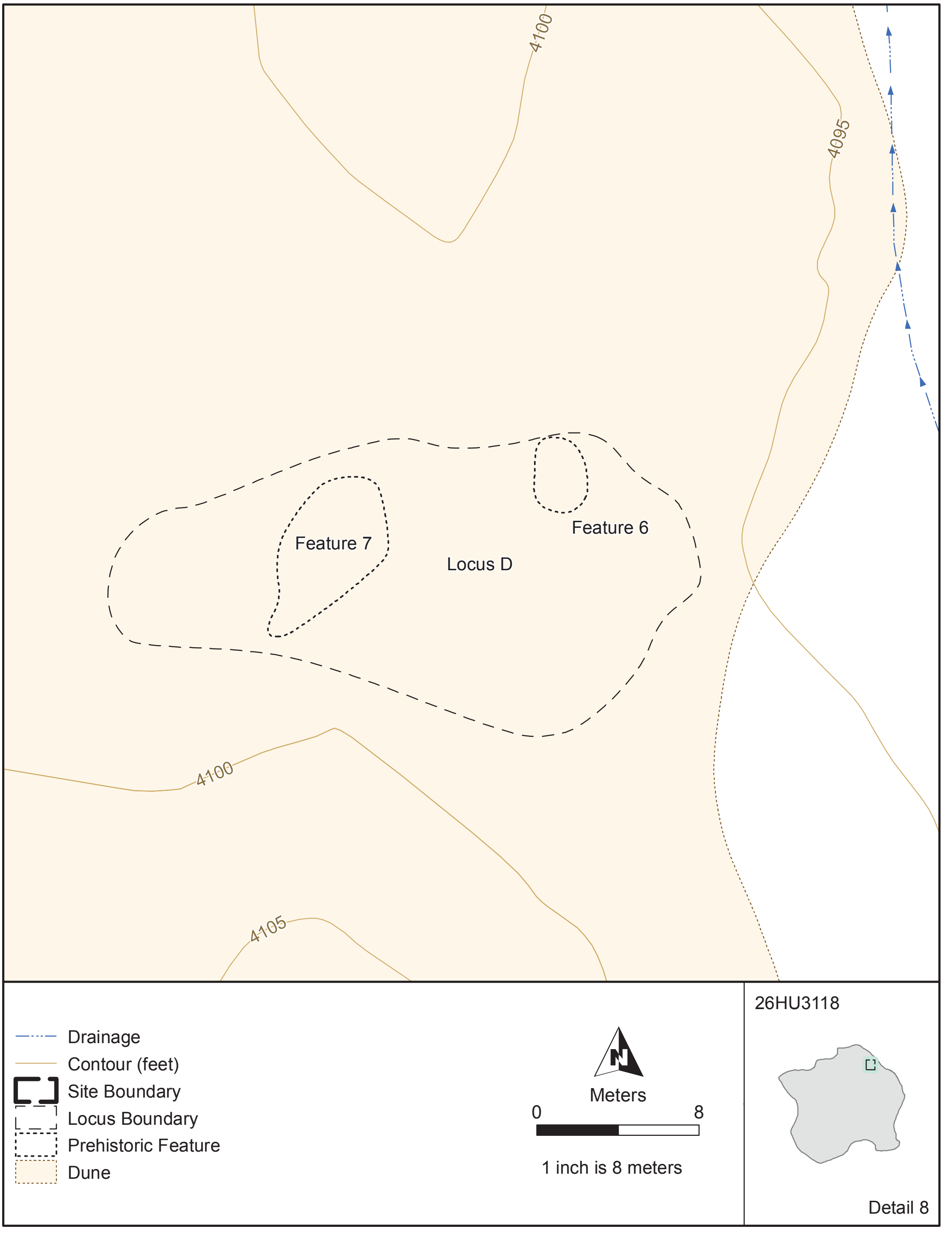


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 8.

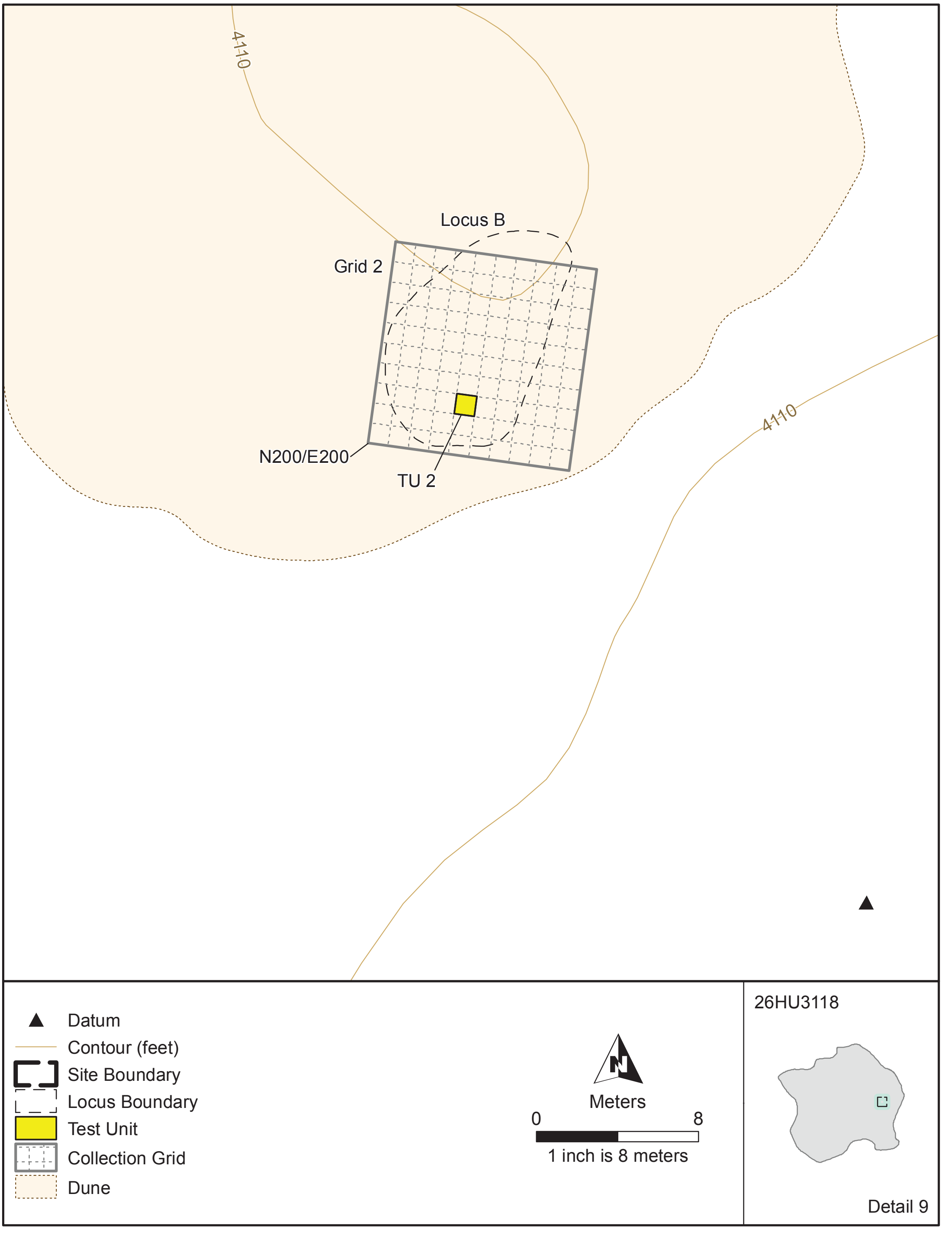


FIGURE 39 (*continued*). 26HU3118 sketch map, Detail 9.

FIGURE 40. 26HU3118 Grid 1 overview.

FIGURE 41. 26HU3118 Grid 4 overview.

TABLE 38
Excavation Summary for 26HU3118

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Late Archaic A	Noncomponent	Total
1	A	Grid 1 N108/E107	1 × 1	0.90	–	0.90
2	B	Grid 2 N202/E204	1 × 1	0.43	–	0.43
3	A	Grid 1 N105/E100	1 × 1	1.00	–	1.00
6	K	–	1 × 1	–	0.53	0.53
7	K	–	2.0 × 0.5	–	0.70	0.70
9	M	Grid 5 N502/E502	1 × 1	1.07	–	1.07
10	G	Grid 3 N306/E302	1 × 1	–	0.80	0.80
11	Nonlocus	Trench 18	1 × 1	0.07	–	0.07
12	A	Trench 18	1 × 1	0.97	–	0.97
18	A	Trench 18	1 × 1	1.24	–	1.24
19	A	Trench 18	0.8 × 1.0	0.86	–	0.86
20-1	M	Trench 20	1.0 × 0.75	0.34	–	0.34
20-2	M	Trench 20	1 × 1	0.68	–	0.68
20-3	M	Trench 20	1.0 × 0.75	0.20	–	0.20
N105/E105	A	Grid 1	1 × 1	0.76	–	0.76
N105/E106	A	Grid 1	1 × 1	0.77	–	0.77
N105/E107	A	Grid 1	1 × 1	0.81	–	0.81
N105/E108	A	Grid 1	1 × 1	0.73	–	0.73
N105/E109	A	Grid 1	1 × 1	0.64	–	0.64
N106/E105	A	Grid 1	1 × 1	0.90	–	0.90
N106/E106	A	Grid 1	1 × 1	0.82	–	0.82
N106/E107	A	Grid 1	1 × 1	0.74	–	0.74
N106/E108	A	Grid 1	1 × 1	0.74	–	0.74
N106/E109	A	Grid 1	1 × 1	0.70	–	0.70
N107/E105	A	Grid 1	1 × 1	1.12	–	1.12
N107/E106	A	Grid 1	1 × 1	0.69	–	0.69
N107/E107	A	Grid 1	1 × 1	0.75	–	0.75
N107/E108	A	Grid 1	1 × 1	0.76	–	0.76
N107/E109	A	Grid 1	1 × 1	0.68	–	0.68
N108/E105	A	Grid 1	1 × 1	1.02	–	1.02
N108/E106	A	Grid 1	1 × 1	0.88	–	0.88
N108/E108	A	Grid 1	1 × 1	0.75	–	0.75
N108/E109	A	Grid 1	1 × 1	0.67	–	0.67
N109/E105	A	Grid 1	1 × 1	1.02	–	1.02
N109/E106	A	Grid 1	1 × 1	0.92	–	0.92
N109/E107	A	Grid 1	1 × 1	0.95	–	0.95
N109/E108	A	Grid 1	1 × 1	0.82	–	0.82
N109/E109	A	Grid 1	1 × 1	0.69	–	0.69

TABLE 38 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Late Archaic A	Noncomponent	Total
N400/E400	C	Grid 4	1 × 1	0.98	–	0.98
N400/E404	C	Grid 4	1 × 1	0.80	–	0.80
N401/E400	C	Grid 4	1 × 1	1.16	–	1.16
N402/E400	C	Grid 4	1 × 1	0.84	–	0.84
N402/E402	C	Grid 4	1 × 1	0.84	–	0.84
N402/E403	C	Grid 4	1 × 1	0.76	–	0.76
N402/E404	C	Grid 4	1 × 1	0.79	–	0.79
N403/E400	C	Grid 4	1 × 1	0.97	–	0.97
N403/E401	C	Grid 4	1 × 1	0.78	–	0.78
N403/E402	C	Grid 4	1 × 1	0.84	–	0.84
N403/E403	C	Grid 4	1 × 1	1.00	–	1.00
N403/E404	C	Grid 4	1 × 1	0.87	–	0.87
N404/E400	C	Grid 4, Trench 5	1 × 1	1.14	–	1.14
N404/E401	C	Grid 4, Trench 5	1 × 1	0.91	–	0.91
N404/E402	C	Grid 4, Trench 5	1 × 1	1.13	–	1.13
N404/E403	C	Grid 4, Trench 5	1 × 1	1.30	–	1.30
N404/E404	C	Grid 4, Trench 5	1 × 1	1.12	–	1.12
N404/E405	C	Grid 4	1 × 1	1.12	–	1.12
N405/E400	C	Grid 4, Trench 5	0.2 × 1.0	0.22	–	0.22
N405/E401	C	Grid 4, Trench 5	0.2 × 1.0	0.18	–	0.18
N405/E402	C	Grid 4, Trench 5	0.5 × 0.5	0.10	–	0.10
N503/E500	M	Grid 5	1 × 1	0.83	–	0.83
N503/E501	M	Grid 5	1 × 1	1.25	–	1.25
N503/E502	M	Grid 5	1 × 1	1.15	–	1.15
N503/E503	M	Grid 5	1 × 1	0.80	–	0.80
N503/E504	M	Grid 5	1 × 1	0.75	–	0.75
N504/E500	M	Grid 5	1 × 1	1.03	–	1.03
N504/E501	M	Grid 5	1 × 1	0.83	–	0.83
N504/E502	M	Grid 5	1 × 1	0.80	–	0.80
N504/E503	M	Grid 5	1 × 1	0.98	–	0.98
N504/E504	M	Grid 5	1 × 1	0.94	–	0.94
N505/E500	M	Grid 5	1 × 1	1.20	–	1.20
N505/E501	M	Grid 5	1 × 1	1.62	–	1.62
N505/E502	M	Grid 5	1 × 1	1.09	–	1.09
N505/E503	M	Grid 5	1 × 1	1.01	–	1.01
N505/E504	M	Grid 5	1 × 1	1.03	–	1.03
N506/E500	M	Grid 5	1 × 1	0.50	–	0.50
N506/E501	M	Grid 5	1 × 1	1.57	–	1.57

TABLE 38 (*Continued*)

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Late Archaic A	Noncomponent	Total
N506/E502	M	Grid 5	1 × 1	1.53	–	1.53
N506/E503	M	Grid 5	1 × 1	1.48	–	1.48
N506/E504	M	Grid 5	1 × 1	1.53	–	1.53
N507/E500	M	Grid 5	1 × 1	0.38	–	0.38
N507/E501	M	Grid 5	1 × 1	0.37	–	0.37
N507/E503	M	Grid 5	1 × 1	0.33	–	0.33
N507/E504	M	Grid 5	1 × 1	0.33	–	0.33
N611/E602	M	Grid 6	1 × 1	0.73	–	0.73
N611/E603	M	Grid 6, Trench 7	1 × 1	1.42	–	1.42
N611/E604	M	Grid 6, Trench 7	1 × 1	1.11	–	1.11
N611/E605	M	Grid 6, Trench 7	1 × 1	1.47	–	1.47
N611/E606	M	Grid 6	1 × 1	1.53	–	1.53
N612/E602	M	Grid 6	1 × 1	0.82	–	0.82
N612/E603	M	Grid 6	1 × 1	1.50	–	1.50
N612/E604	M	Grid 6	1 × 1	1.50	–	1.50
N612/E605	M	Grid 6	1 × 1	1.41	–	1.41
N612/E606	M	Grid 6	1 × 1	0.98	–	0.98
N613/E602	M	Grid 6	1 × 1	0.78	–	0.78
N613/E603	M	Grid 6	1 × 1	1.31	–	1.31
N613/E604	M	Grid 6	1 × 1	1.14	–	1.14
N613/E605	M	Grid 6	1 × 1	1.35	–	1.35
N613/E606	M	Grid 6	1 × 1	0.99	–	0.99
N614/E602	M	Grid 6	1 × 1	0.66	–	0.66
N614/E603	M	Grid 6	1 × 1	1.14	–	1.14
N614/E604	M	Grid 6	1 × 1	1.15	–	1.15
N614/E605	M	Grid 6	1 × 1	1.16	–	1.16
N614/E606	M	Grid 6	1 × 1	1.37	–	1.37
N615/E602	M	Grid 6	1 × 1	0.23	–	0.23
N615/E603	M	Grid 6	1 × 1	0.52	–	0.52
N615/E604	M	Grid 6, Trench 7	1 × 1	0.59	–	0.59
N615/E605	M	Grid 6	1 × 1	0.59	–	0.59
N615/E606	M	Grid 6	1 × 1	0.24	–	0.24
N617/E602	M	Grid 6, Trench 7	1 × 1	1.42	–	1.42
N618/E600	M	Grid 6	1 × 1	0.35	–	0.35
N618/E601	M	Grid 6	1 × 1	0.22	–	0.22
N619/E600	M	Grid 6	1 × 1	0.36	–	0.36
N619/E601	M	Grid 6	1 × 1	0.29	–	0.29
Total				96.55	2.03	98.58

TABLE 39
Trench Summary for 26HU3118
Trenches 4 and 7 not excavated.

Trench Label	Length (m)	Width (m)	Depth (m)	Bearing (° N)	Grid	Comments
Trench 1	18.7	0.7	1.3	350	–	–
Trench 2	11.4	0.9	1.1	80	–	–
Trench 3	7.1	1.1	1.3	80	–	–
Trench 5	13.8	0.7	1.2	320	4	–
Trench 6	11.7	0.7	1.2	275	–	Mazama
Trench 8	17.0	2.7	0.4	52	–	Stepped for access
Trench 9	27.0	3.0	1.1	70	–	Stepped for access
Trench 10	30.0	3.0	1.2	340	–	Stepped for access
Trench 11	27.0	3.0	1.7	350	–	Stepped for access
Trench 12	36.0	3.0	2.0	340	–	Stepped for access
Trench 13	43.0	3.5	2.0	20	–	–
Trench 14	38.0	2.5	1.2	13	–	–
Trench 15	28.0	3.2	1.2	45	–	Stepped for access
Trench 16	19.0	4.0	1.2	45	–	Stepped for access
Trench 17	39.0	2.4	1.2	360	–	–
Trench 18	40.0	5.0	3.2	360	–	Stepped for access
Trench 19	19.0	2.0	1.1	360	–	–
Trench 20	30.0	3.0	1.7	8	–	Stepped for access
Trench 21	45.0	21.0	1.2	n/a	5 and 6	Dune removal

dune field. The sand sheet rests on alluvium that interfingers with lacustrine sediments of pluvial Lake Lahontan. The dunes and sandsheet are cut through and bounded by several small rills originating from adjacent alluvial fans. In the central site area, alluvial erosion and aeolian deflation have opened a relatively large interdune area exposing distal fan and lacustrine deposits.

To explore the archaeological setting and document the stratigraphic context of individual dune forms within the expansive site, 19 backhoe trenches were excavated at 26HU3118. Stratigraphy and soil descriptions, noted for all trenches, were completed in detail for Trench 16. While all trenches provided stratigraphic exposures of dunes and underlying alluvium, many were used for exploratory purposes, to look for buried surfaces and/or features preserved within the dune. Several of the deeper trenches were stepped for safe access and observations.

In general, three strata are observed throughout the Sulphur Springs dune field. This is the case at 26HU3118, where the dunes resting on alluvium show two distinct periods of deposition separated by a period of stability and subsequent erosion. The underlying sedimentary package is a thin, gravelly alluvium on lacustrine deposits.

Trench 16 bisects a dune with a height of three to four meters (figs. 42, 43). The trench was excavated into the crest and lee slope of the dune; aeolian deposits (Strata II and III) thickened near the top of the dune. The thickness of the aeolian strata decreases along the dune slope and gradually coalesces with the alluvial channel at the northeast end of the trench. Coarse-grained gravel and cobbles are exposed in the northeast end of the trench. A very well-developed soil is

TABLE 40
Feature Summary for 26HU3118
Three features lack measurements.

Features	Mean	Standard Deviation	Coefficient of Variation
Small (≤ 5.0 m; *n* = 13)			
Size	3.9	1.1	0.27
Number of rocks	37.7	37.2	1.00
Medium (>5.0–10.0 m; *n* = 11)			
Size	7.4	1.5	0.20
Number of rocks	101.5	94.2	0.92
Large (>10.0 m; *n* = 3)			
Size	16.0	4.0	0.25
Number of rocks	75.0	25.0	0.33

present on the alluvial deposit (Stratum I) exposed at the base of the trench.

The alluvial deposit of Stratum I consists of moderately sorted, upward-fining, clast-supported, and subrounded to subangular mixed volcanic gravel and cobbles. In places, the gravel and cobbles are supported in a fine-grained matrix and, as a whole, appear similar to that observed in debris flow deposits. The paleosol evident on Stratum I is reddened and has strong, fine-to-medium subangular blocky structure, and many distinct and continuous clay films on ped faces and lining pores.

The relative degree of soil development observed on Stratum I is suggestive of substantial age. At a minimum, the soil would have begun forming soon after regression of pluvial Lake Lahontan. The soil could also be a remnant formed on the local piedmont prior to the last highstand. On the other hand, a number of environmental factors could have played a role in the strong degree of soil development, such as the local landscape position, large influx of dust from the Black Rock playa, and groundwater influence, thereby giving it the appearance of being older than it actually is. Elsewhere in the site area, the Mazama tephra is present in the upper profile of an alluvial cut-and-fill at the top of Stratum I. Without deeper exposure, particle size and chemistry data, and temporal control, it is possible to say only that the deposit is substantially older than the dunes that bury it. Given the stratigraphic position of the Mazama tephra in the top of Stratum I, most local dune activity postdates 7700 cal B.P.

The soils observed on Strata II and III are similar to those observed elsewhere in the Sulphur Springs dune field. The A horizon on Stratum II has been removed by erosion, probably during dune reactivation, and the remaining buried soil consists primarily of a weakly developed Bwk horizon overlying a Ck horizon. The soil on Stratum III is weakly developed, showing a thin Ak horizon over a Ck horizon of variable thickness. The time represented by the two weakly developed soils is likely less than a few thousand years. Subtle zones of slightly greater induration, perhaps related to soil development, occur within Stratum II raising the possibility that the stratum represents more than one period of aeolian deposition. The fact that a well-defined, continuous soil contact is not observed within the stratum, however, suggests relatively continuous aeolian deposition. The rates of aeolian deposition undoubtedly varied allowing weak soil formation (e.g., induration), and showing short intervals of landscape stability between aeolian pulses.

FEATURES: Thirty prehistoric features were identified at 26HU3118 (table 40), 15 in formal

TABLE 41
Radiocarbon Dates from 26HU3118
TU = test unit.

Cat. No.	Locus	Provenience	Feature	Level	Lab No. (Beta-)	Sample Description	Delta ^{13}C	Conventional Age	Error	Median Probability (cal B.P.)	2σ Range
18513	A	TU N108/E106	–	3	387620	Mammal bone	-18	1170	±30	1101	986–1179
20093	M	Feature 28.1	28.1	–	386894	Greasewood charcoal	-23	1260	±30	1218	1123–1281
20094	M	Feature 32.1	32.1	–	386895	Sagebrush charcoal	-22	1270	±30	1225	1147–1287
20096	–	TU 11	33	1	386896	Greasewood charcoal	-23	1480	±30	1364	1306–1411
20095	C	Feature 4-1	4-1	–	386893	Greasewood charcoal	-26	1530	±30	1420	1352–1522

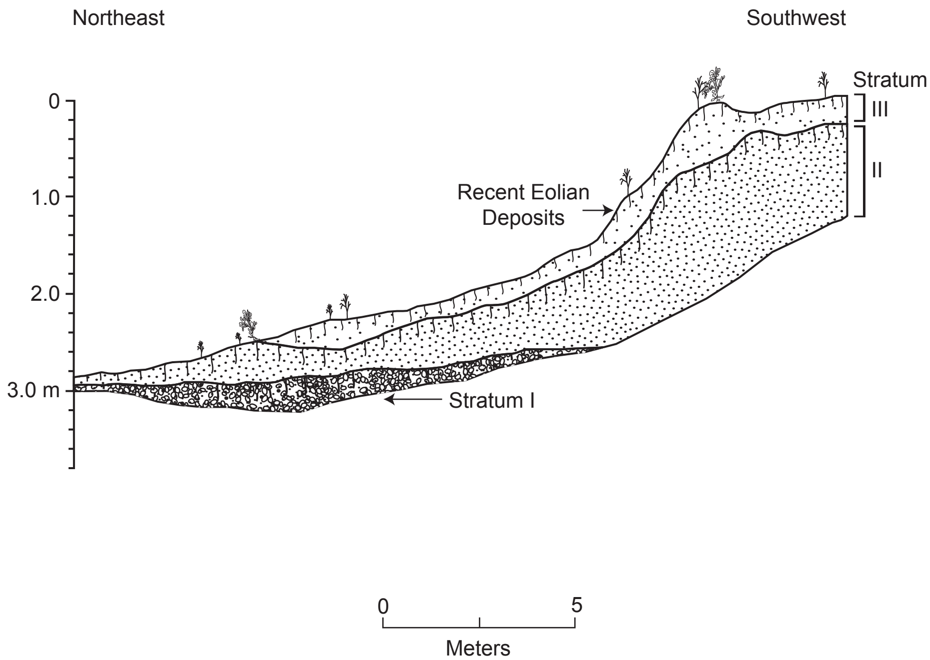


FIGURE 42. 26HU3118 Schematic cross section of Trench 16. Based on original illustration courtesy of Thomas F. Bullard.

loci and 15 in other portions of the site. Although the feature numbers go from Feature 1 through Feature 33, the Feature 5 designation was not used, Feature 31 is historic era, and Feature 10 is a collapsed cairn of unknown age (but probably historic era).

All the prehistoric features are clusters of fire-affected rock, with the vast majority (93%) observed on the surface of the site. Based on surface observations, 13 had flaked stone debitage and tools, 10 only debitage, and seven with no associations at all. They are oval in shape and tend to fall into three size groups based on the 27 with full measurements (table 40). The smallest group has maximum dimensions of ≤5.0 m (*n* = 13), with a mean of 3.9 m (s.d. = 1.1; c.v. = 0.27). The next group ranges between >5.0 and 10.0 m in maximum dimension (*n* = 11), with a mean of 7.4 m (s.d. = 1.5; c.v. = 0.20). Finally, the largest group (*n* = 3) has a mean of 16.0 m (s.d. = 4.0; c.v. = 0.33). These three groups are discrete from one another (they do not overlap at one s.d.), and are fairly clustered in their sizes as demonstrated by their relatively low c.v. values.

The number of rocks observed at each feature is much more variable, and not correlated with feature size (table 40). Although the small-sized group has the smallest number of rocks (mean = 37.7), it has a huge standard deviation (37.2) and coefficient of variance (1.00), indicating a wide range of rock counts from one feature to the next. This is also the case for the medium-sized group, which also has the highest number of rocks per feature (*n* = 101.5). The largest group has intermediate numbers of rock (mean = 75.0), and shows a lesser degree of interfeature variability.

Ten features were formally hand-excavated, six were bisected with backhoe trenches, and the remaining 17 were not sampled. Most of the hand-excavated features produced significant amounts of debitage, but other items were limited to 10 bifaces, two formed flake tools, one simple flake tool, one anvil, a core, and 19 pieces of faunal bone. The status of plant macrofossils remains is unknown due to the lack of a robust

FIGURE 43. 26HU3118 Photographic cross section of Trench 16. Photo courtesy of Thomas F. Bullard.

flotation sampling program during the field phase of the project.

Radiocarbon Dates: Five radiocarbon dates were obtained from the site (table 41). All of them fall within the Late Archaic Period, with median probabilities ranging from 1420 to 1101 cal b.p. They are widely spread across the site, found within Locus A (Grid 1 [1101 cal b.p.]), Locus C (Grid 4, Feature 4 [1420 cal b.p.]), Locus M (Feature 28, Grid 5 [1218 cal b.p.] and Feature 30, Grid 6 [1225 cal b.p.]), and Trench 18 (Feature 33, TU 11 [1364 cal b.p.]). It is interesting to note the two dates from Locus M are essentially identical.

Projectile Points: Twenty-six projectile points were recovered from 26HU3118 (table 42). Consistent with the radiocarbon dates, most of the diagnostic forms are Rosegate (*n* = 12). Other arrow-sized specimens include indeterminate arrows (*n* = 5), one Small Stemmed, and a single Desert Side-notched. The remaining points include three Great Basin Stemmed, two Gatecliff, and two indeterminate fragments.

Seven of the Rosegate points were found in Locus A (Grid 1) along with the 1100 cal b.p. radiocarbon date; this area also produced three indeterminate arrows. Locus M, which has the radiocarbon dates of 1218 cal b.p. (Grid 5) and

TABLE 42
Projectile Point Assemblage from 26HU3118
CCS = cryptocrystalline silicate.

Projectile Point	Late Archaic A		Noncomponent	Total
	Obsidian	CCS	Obsidian	
Great Basin Stemmed	–	–	3	3
Gatecliff	–	–	2	2
Rosegate	7	3	2	12
Small Stemmed	1	–	–	1
Desert Side–notched	1	–	–	1
Indeterminate arrow	2	2	1	5
Indeterminate	1	–	1	2
Total	12	5	9	26

1225 cal B.P. (Grid 6), has two Rosegate points in Grid 5, and one from Feature 29 at the southern end of the locus. Feature 29 also produced one Desert Side-notched point, however, reflecting a minor Terminal Prehistoric intrusive element within this portion of the site. Locus B (Grid 2) produced one Rosegate point and no other temporal indicators, while the final Rosegate point was found away from any loci or features at the site.

Locus C yielded the Small Stemmed specimen along with the 1420 cal B.P. radiocarbon date, while the final indeterminate arrow was found within Feature 26 (Trench 20).

All three of the Great Basin Stemmed points were widely scattered across the site, lacking associations with any locus or feature. This was also the case for the two Gatecliff points.

BEADS: Thirty shell beads were recovered from the site, including 29 made from *Olivella* shell and one from *Dentalium* (table 43; see also Chronological Controls). Only five could be assigned to a definitive type, as most are quite fragmentary and many are burned. The diagnostic specimens come from grids 1, 5, and 6, all of which have projectile points and/or radiocarbon dates corresponding to the Late Archaic Period.

Grid 1 has a G1 (Tiny Saucer), a C4 (Split End Perforated), and a single A1a (Small Spire-Lopped). The G1 bead corresponds to the Middle/Late Transition (930–685 cal B.P.) in Central California (Scheme D; Groza et al., 2011), which is our Late Archaic. This is also the case for the C4, but it is found in earlier contexts as well (i.e., 2150–1530 and 930–685 cal B.P.), while A1a (Small Spire-Lopped) beads saw two major periods of use, one during the Early and Middle Archaic (5500–2775 cal B.P.) and the other during the Terminal Prehistoric (685–180 cal B.P.).

Grid 1 also has six fragments that could fall within the C series (Split beads) or E series (Lipped beads). The former largely correspond to the Middle/Late Transition/Late Archaic, while the latter date to Late Phase 2 (440–180 cal B.P.) in Central California. Given the absence of radiocarbon dates dating to this interval, and the corresponding lack of Desert Series projectile points in this location, the latter alternative seems highly unlikely.

Grid 5 has a single C2 (Split Drilled) which, like the C4 in Grid 1, is found in two temporal intervals (930–685 cal B.P. and 2150–1530 cal B.P.). It also has three possible C-series beads and two possible C or E series specimens. Given the larger temporal context of the site, it seems likely that they fall into the C series and correspond to the Middle/Late Transition/Late Archaic interval. This is also the case for the single possible C-series bead in Grid 6.

TABLE 43
Shell Beads from 26HU3118

Material	Type	cal B.P. Range	Late Archaic A	Noncomponent	Total
Shell bead					
Olivella	A1a, Small spire-lopped	5500–2775; 685–180	1	–	1
Olivella	C2, Split drilled	2150–1530; 930–685	2	–	2
Olivella	C4, Split and perforated	2150–1530; 930–685	1	–	1
Olivella	G1, Tiny saucer	930–685	1	–	1
Olivella	Possible C	–	4	–	4
Olivella	Possible C or E	–	8	–	8
Olivella	Indeterminate	–	12	–	12
Dentalium	–	–	–	1	1
Stone bead					
Malachite	Disc	–	–	1	1
Modified shell					
Olivella	Indeterminate	–	9	–	9
Non-Vertebrata, indeterminate	Indeterminate	–	2	–	2
Total			40	2	42

Component Definition: The above distribution of temporal indicators and radiocarbon dates shows that the majority of material at the site dates to the Late Archaic Period, especially within the grid areas where most of the excavations took place. Grid 1 and Trench 18 (Locus A); Grid 2 (Locus B); Grid 4 (Locus C); Grid 5, Feature 28, and Grid 6, Feature 30 (both Locus M); and Trench 20 all have some combination of Rosegate, Small Stemmed, or arrow-sized projectile point fragments, Late Archaic radiocarbon dates, and only one Desert Side-notched point. As a result, all these areas are assigned to the Late Archaic Period. Because all the radiocarbon assays correspond to the early end of this interval, the component is designated Late Archaic A.

Grid 3 lacks chronological information so it is given a noncomponent status. As noted above, the Great Basin Stemmed and Gatecliff projectile points are widely scattered across the site outside the loci, so they and all other materials outside of the aforementioned grids are also given noncomponent status.

Assemblage

Late Archaic A Inventory: The Late Archaic A assemblage is dominated by flaked stone tools (n = 258; 83%), followed by much lower frequencies of shell beads (n = 29; 9%), other modified shell (n = 11; 4%), ground and battered stone implements (n = 13; 4%), and only one bone artifact (<1%; table 44). The projectile points and shell beads have already been discussed above, while other modified shell includes small fragments that are probably parts of beads. As a result, this artifact class will not be discussed further. All the others are detailed below.

Flaked Stone Tools and Debitage. Bifaces (n = 168; 65%) are by far the most abundant flaked stone artifact recovered (table 44). Other tools include simple flake tools (n = 37; 14%), formed flake tools (n = 19; 7%), projectile points (n = 17; 7%), and cores (n = 17; 7%). Debitage is represented by over 24,000 pieces.

Projectile Points. A total of 26 projectile points were recovered from Late Archaic A contexts, most

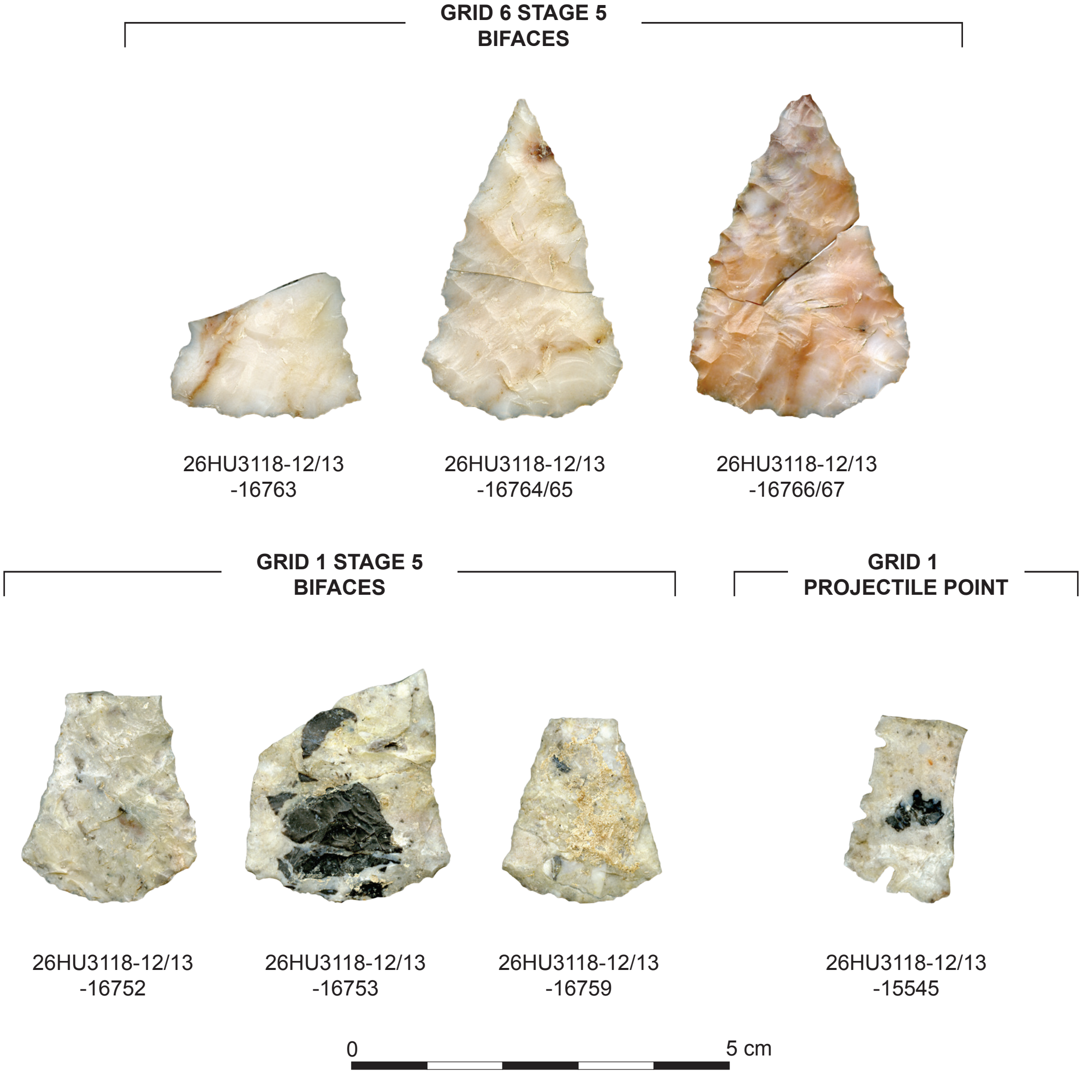


FIGURE 44. 26HU3118 Rosegate preforms.

represented by Rosegate or indeterminate arrow-sized specimens (see table 42). Twelve are fashioned from obsidian and five from CCS. The obsidian points include whole or mostly whole specimens (*n* = 4), as well as proximal end fragments (*n* = 2) and a margin fragment. The CCS points include a complete artifact, as well as distal (*n* = 1), proximal (*n* = 2), and margin (*n* = 1) fragments.

Bifaces. Most of the bifaces are made from CCS (*n* = 159; 95%), while the remainder are obsidian (*n* = 9; 5%; table 45). A full range of biface stages are represented in the CCS sample, including Stage 2 (*n* = 21; 15%), Stage 3 (*n* = 33; 23%), Stage 4 (*n* = 49; 34%), and Stage 5 (*n* = 38; 27%), in addition to a single Stage 1 specimen. The relatively high frequency of Stage 4 and Stage 5 specimens, including 18 of which seem to be projectile point preforms, indicate that local CCS material was being used to produce finished tools at the site.

The projectile point preforms display a uniform morphology that is consistent with the prox-

TABLE 44
Artifact Inventory Summary from 26HU3118

Type	Late Archaic A	Noncomponent	Total
Flaked stone			
Projectile point	17	9	26
Biface	168	51	219
Drill	–	1	1
Formed flake tool	19	15	34
Flake tool	37	21	58
Cobble tool	–	1	1
Core tool	–	3	3
Core	17	9	26
Tested cobble	–	1	1
Debitage	24,355	1741	26,096
Ground stone			
Millingstone	3	7	10
Handstone	4	5	9
Anvil	2	–	2
Battered cobble	3	2	5
Misc. ground stone	1	–	1
Miscellaneous prehistoric items			
Bead, shell	29	1	30
Bead, stone	–	1	1
Awl	1	–	1
Modified shell	11	–	11
Faunal Remains			
Bone	1449	24	1473
Shell	6	–	6
Total	26,122	1892	28,014

imal ends of Rosegate projectile points, short of notches (see fig. 44). All 18 specimens are fragments, exhibiting breaks that are indicative of manufacture errors. Four fragments were collected that refit to yield two complete preforms. The preforms were found within three excavation grids, grids 1, 5, and 6, and while morphology was consistent between grids, Grid 1 preforms, located in Locus A, were primarily manufactured from a different CCS cobble source than those in grids 5 and 6 in Locus M. Cores and early-stage bifaces were collected from Loci A and M that were prepared from the same CCS sources as the preforms from each locus, indicating a local and complete reduction sequence for CCS Rosegate projectile points from core reduction to finely pressure-flaked shaping.

Obsidian bifaces show a completely different pattern. While none are projectile point preforms, all of them are Stage 5 specimens, indicating that they were brought to the site in finished or near-finished condition, and probably maintained and ultimately discarded once their usefulness came to an end. This also seems to be the

TABLE 45
Flaked Stone Tool Inventory from 26HU3118
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic.

Type	Late Archaic A				Noncomponent				Total
	Obsidian	CCS	FGV	Rhyolite	Obsidian	CCS	FGV	Quartzite	
Biface									
Stage 1	–	1	–	–	–	–	–	–	1
Stage 2	–	21	–	–	2	3	–	–	26
Stage 3	–	33	–	–	3	7	–	–	43
Stage 4	–	49	–	–	4	18	1	–	72
Stage 5	7	38	–	–	3	6	–	–	54
Indeterminate stage	2	17	–	–	1	3	–	–	23
Subtotal	9	159	–	–	13	37	1	–	219
Drill									
Diamond bit cross section	–	–	–	–	–	1	–	–	1
Subtotal	–	–	–	–	–	1	–	–	1
Formed Flake Tool									
Biface-reduction flake blank	–	1	–	–	–	1	–	–	2
Interior flake blank	–	7	1	–	1	7	–	–	16
Cortical flake blank	–	2	–	–	–	1	–	–	3
Flake blank	–	1	–	–	–	–	–	–	1
Split cobble blank	–	1	–	–	1	1	–	–	3
Tabular cobble blank	–	1	–	–	–	1	–	–	2
Indeterminate blank type	–	4	–	1	–	2	–	–	7
Subtotal	–	17	1	1	2	13	–	–	34
Average number of modified edges	–	1.7	2.0	1.0	1.5	1.5	–	–	1.6
Flake Tool									
Biface-reduction flake blank	–	3	–	1	–	1	–	–	5
Interior flake blank	–	19	1	–	1	11	–	–	32
Cortical flake blank	1	2	1	–	–	3	1	–	8
Flake blank	–	1	–	–	–	1	–	–	2
Split cobble blank	–	1	–	–	–	1	–	–	2
Tabular cobble blank	–	1	1	–	–	–	–	–	2
Globular cobble blank	–	–	2	–	–	–	–	–	2
Indeterminate blank type	–	3	–	–	–	2	–	–	5
Subtotal	1	30	5	1	1	19	1	–	58
Average number of modified edges	1.0	1.2	1.2	1.0	1.0	1.2	1.0	–	1.2
Cobble Tool									
Split cobble blank	–	–	–	–	–	–	–	1	1
Subtotal	–	–	–	–	–	–	–	1	1

TABLE 45 (*Continued*)

Type	Late Archaic A				Noncomponent				Total
	Obsidian	CCS	FGV	Rhyolite	Obsidian	CCS	FGV	Quartzite	
Core Tool									
Indeterminate blank type	–	–	–	–	1	2	–	–	3
Subtotal	–	–	–	–	1	2	–	–	3
Core									
Multidirectional	1	11	3	–	1	6	–	–	22
Unidirectional	–	–	2	–	–	2	–	–	4
Subtotal	1	11	5	–	1	8	–	–	26
Tested cobble									
Tabular cobble blank	–	–	–	–	–	1	–	–	1
Subtotal	–	–	–	–	–	1	–	–	1
Total	11	217	11	2	18	81	2	1	343

TABLE 46

Debitage Analysis from 26HU3118

CCS = cryptocrystalline silicate; FGV = fine-grained volcanic; Indet. = indeterminate.

Debitage	Late Archaic A					Noncomponent				Total
	Obsidian	CCS	FGV	Quartzite	Indet.	Obsidian	CCS	FGV	Quartzite	
Diagnostic										
Core reduction	–	34	–	–	–	–	1	–	–	35
Core reduction/ flake tool production	–	8	–	–	–	–	1	–	–	9
Biface production	–	69	1	–	–	–	12	–	–	82
Tool finishing/resharpening	–	15	–	–	–	–	1	–	–	16
Nondiagnostic										
General percussion	19	371	3	1	–	–	26	–	–	420
Indeterminate type	10	496	–	2	–	–	28	1	–	537
Not analyzed	688	22,288	309	40	1	93	1562	13	3	24,997
Total	717	23,281	313	43	1	93	1631	14	3	26,096

case with the projectile points (see table 42), which are more often made from obsidian (*n* = 12) than CCS (*n* = 5). Obsidian projectile points were likely transported back to the site more readily than CCS points, resulting in larger numbers of obsidian points recorded on-site, although CCS projectile points were likely being manufactured at a greater frequency.

Formed Flake Tools. All but two of the formed flake tools are made from CCS (89%); the others are made from fine-grained volcanic stone and rhyolite (see table 45). The CCS sample averages 1.7 working edges per tool, while the other material types have 2.0 and 1.0, respectively. More than half (53%) of the diagnostic sample was fashioned from interior flakes, while the others were made from a wide variety of flake blanks, including cortical, split cobble, and biface thinning. Similar to the bifaces, this profile reflects use of early stage reduction flakes generated from locally gathered materials.

Flake Tools. Simple flake tools show a slightly higher degree of material variability (see table 45). While CCS is still the most prevalent material used (81%), there are five made from fine-grained volcanic stone (14%), and one each from obsidian (3%) and rhyolite (3%). This assemblage averages only 1.2 working edges per tool (less than the formed flake tools), probably reflecting the more casual, expedient use of these simple items. Like the formed flake tools, more than half (59%) are made from interior flakes, with the others widely distributed across cortical, biface reduction, and a variety of coble flakes and blank types.

Cores. Cores are also dominated by CCS (*n* = 11; 65%), but show a significant contribution of fine-grained volcanic (*n* = 5; 29%). Only one (6%) obsidian core was found. All but two are multidirectional forms. The others (both fine-grained volcanic) have unidirectional flake removals (see table 45).

Debitage. The Late Archaic debitage assemblage is dominated by CCS (96%), followed by much lower frequencies of obsidian (3%), fine-grained volcanic (1%), and only trace amounts of other materials types (table 46). Only a small percentage of this material was analyzed (5%), and an even smaller percentage of the analyzed sample produced diagnostic attributes (0.5%). The diagnostic sample is essentially limited to CCS, which shows a full range of reduction activities, including core reduction (33%), biface thinning (55%), and tool finishing/resharpening (12%). This profile shows a greater emphasis on early stage reduction activity than the bifaces, which include 61% late stage forms (i.e., stages 4 and 5), indicating that some of the latter were brought to the site in near-finished condition.

None of the 29 obsidian flakes analyzed (4% of the total) had diagnostic attributes. All were classified as general percussion or indeterminate (table 46).

Ground and Battered Stone Tools. A wide range of material types are represented by this class of tools, including felsite (*n* = 3), quartzite (*n* = 3), sandstone (*n* = 3), fine-grained volcanic (*n* = 2), granite (*n* = 1), CCS (*n* = 1), and indeterminate (*n* = 1).

All three millingstones show unifacial wear in the form of grinding (table 47). This is also the case for two of the handstones, while the other has bifacial grinding. Both of the anvils have unifacial pecking, while all three of the battered cobbles also have single concentrations of wear in the form of flaking. Finally, the single miscellaneous ground stone item has a single facet of grinding.

Obsidian Source Data. All nine artifacts subjected to XRF analysis were projectile points (table 48). They represent a wide range of sources (*n* = 5), including Buffalo Hills, Double H, Massacre Lake/Guano Valley, Mount Majuba, and Unknown A. A more detailed accounting of these findings by projectile point type and temporal component is provided in Summary and Conclusions.

Faunal Remains. More than 1400 bones were found within the Late Archaic A component at the site (table 49). The most common taxa within the identifiable portion of the mammal assemblage are rabbits (35%; mostly jackrabbit) and squirrels (35%), followed by lower frequencies of artiodactyls (16%), coyotes (9%), woodrats (3%),

TABLE 47
Ground Stone Tool Inventory from 26HU3118
Three ground stone fragments refit with other cataloged fragments, and each refitted object was analyzed as a single artifact.

Type	Late Archaic A			Noncomponent				Total
	Grinding	Pecking	Flaking	Grinding	Pounding	Flaking	Grinding and Crushing	
Millingstone								
One-use wear surface	3	–	–	7	–	–	–	10
Subtotal	3	–	–	7	–	–	–	10
Handstone								
One-use wear surface	2	–	–	–	1	–	–	3
Two-use wear surfaces	1	–	–	1	–	–	–	2
Five-use wear surfaces	–	–	–	–	–	–	1	1
Subtotal	3	–	–	1	1	–	1	6
Anvil								
One-use wear surface	–	2	–	–	–	–	–	2
Subtotal	–	2	–	–	–	–	–	2
Battered cobble								
One-use wear surface	–	–	3	–	–	2	–	5
Subtotal	–	–	3	–	–	2	–	5
Miscellaneous ground stone								
One-use wear surface	1	–	–	–	–	–	–	1
Subtotal	1	–	–	–	–	–	–	1
Total	7	2	3	8	1	2	1	24

and kangaroo rats (2%). Larger mammals make up a larger percentage of the less diagnostic portion of the assemblage, with Large Mammal (deer-sized and larger) making up 41%, Medium Mammal (includes jack rabbit- and coyote-sized animals) 41%, and Small Mammal (rodents) 17%, indicating that large mammal bone was intensively processed for marrow. Only one indeterminate bird bone was recovered, while reptiles were represented by 48 items. Most of these were lizards, with horned lizard standing out within the identifiable portion of the assemblage.

Noncomponent Areas: A broad mixture of time periods is represented by the noncomponent materials. The Great Basin Stemmed, Gatecliff, and Rosegate projectile points are widely scattered around the site, reflecting activities spanning at least the Paleoarchaic, Early Archaic, and Late Archaic periods. Because we cannot segregate these materials into single-component assemblages, we provide only a cursory review of the findings.

Artifacts and Faunal Remains. Flaked stone tools make up an even larger percentage of the noncomponent assemblage (n = 111; 87%) than the Late Archaic, largely the result of a lower number of shell beads recovered from across the larger site area (n = 1; 1%). Ground and battered stone tools (n = 14; 11%) are also relatively rare (see table 44).

The flaked stone tool assemblage shows a dominant presence of bifaces (46%), followed by flake tools (19%), formed flake tools (14%), projectile points (9%), cores (8%), and a minimal number of items falling into four other artifact classes. All of the projectile points are made from obsidian,

TABLE 48
Obsidian Sources from 26HU3118

	Late Archaic A	Noncomponent	Total
Projectile Point			
Buffalo Hills	2	1	3
Craine Creek	–	1	1
Double H	3	1	4
Fox Mountain	–	1	1
Massacre Lake/Guano Valley	1	–	1
Mount Majuba	2	2	4
Paradise Valley	–	1	1
Seven Troughs Range	–	1	1
Unknown A	1	–	1
Biface			
Bordwell Spring	–	1	1
Double H	–	1	1
Total	9	10	19

while the bifaces are dominated by CCS (73%), followed by much lower frequencies of obsidian (25%; see table 45). More than 80% of the obsidian bifaces are Stage 3 or higher, while this is the case for over 90% of the CCS specimens.

Almost all of the flake tools and formed flake tools are made of CCS, combining for 89% of the two assemblages. Most are made from interior or cortical flakes, or some sort of split cobble, indicating on-site production using relatively local toolstone. Only 1% of the debitage (and no obsidian) was analyzed, with most reflecting biface thinning and minimal evidence for earlier and later stages of reduction.

Ground and battered stone tools include millingslabs (*n* = 7), handstones (*n* = 5), and two battered cobbles. Most of these tools are made from felsite, quartzite, and fine-grained volcanic stone, and have moderate wear (see table 47).

Eight of the 10 artifacts subjected to XRF analysis were projectile points; the other two were bifaces (table 48). They represent a wide range of sources (*n* = 8), including Buffalo Hills, Craine Creek, Double H, Fox Mountain, Massacre Lake/Guano Valley, Mount Majuba, Paradise Valley, Seven Troughs Range, Unknown A, and Bordwell Spring. A more detailed accounting of these findings by projectile point type and temporal component is provided in Summary and Conclusions.

Only 24 pieces of bone were recovered from the noncomponent parts of the site. The identifiable portion includes artiodactyl (*n* = 6), jackrabbit (*n* = 4), and squirrel (*n* = 3), while the more generic identifications produced a comparable mix of these three size classes (table 49).

Site Summary

Site 26HU3118 is a large accumulation of flaked stone tools, shell beads, ground and battered stone implements, and several clusters of fire-affected rock occupying a series of sand dunes located along the southeastern margins of the Black Rock playa. Although a few Great Basin Stemmed and Gatecliff series projectile points are scattered across the area, the vast majority of artifacts and features date to the Late Archaic A Period (radiocarbon dates range between 1420 and 1100 cal B.P.), predating the MCA.

The diversified artifact assemblage, combined with the high density of cooking features, indi-

TABLE 49
Faunal Remains from 26HU3118

Common Name	Taxon	Late Archaic A		Noncomponent		Total	
		Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
Bird							
Bird, indeterminate	Aves, indeterminate	3	0.05	–	–	3	0.05
Mammal							
Cow, domestic	*Bos taurus taurus*	1	26.30	–	–	1	26.30
Artiodactyl, indeterminate	Artiodactyla, indeterminate	40	6.26	6	1.95	46	8.21
Coyote	*Canis latrans*	22	39.92	–	–	22	39.92
Hare, black-tailed	*Lepus californicus*	77	12.48	4	0.48	81	12.96
Hare/rabbit	Leporidae	10	0.29	–	–	10	0.29
Rat, kangaroo	*Dipodomys* spp.	6	0.23	–	–	6	0.23
Squirrel/chipmunk	Sciuridae	86	5.37	3	0.37	89	5.74
Woodrat	*Neotoma* spp.	8	1.39	–	–	8	1.39
Rodent, indeterminate	Rodentia, indeterminate	55	1.38	1	0.03	56	1.41
Mammal, large	Mammalia, large	210	56.84	3	0.59	213	57.43
Mammal, medium	Mammalia, medium	215	23.59	1	0.02	216	23.61
Mammal, small	Mammalia, small	32	0.69	1	0.04	33	0.73
Mammal, indeterminate	Mammalia, indeterminate	636	22.11	5	0.03	641	22.14
Reptile							
Lizard, horned	*Phrynosoma* spp.	11	0.15	–	–	11	0.15
Lizard	Lacertilia	24	0.27	–	–	24	0.27
Snake, garter	*Thamnophis* spp.	1	0.07	–	–	1	0.07
Snake, king	*Lampropeltis* spp.	1	0.03	–	–	1	0.03
Snake, night	*Hypsiglena* spp.	3	0.25	–	–	3	0.25
Snake, nonvenomous	Colubridae	6	0.46	–	–	6	0.46
Snake	Serpentes	1	0.01	–	–	1	0.01
Reptile, indeterminate	Reptilia, indeterminate	1	0.01	–	–	1	0.01
Total		1449	198.15	24	3.51	1473	201.66

cates that the site served as a residential base, but the lack of houses indicates that these occupations were more ephemeral than those discovered at other sites within the project area. Although we know little about the plant macrofossils from the site, the dominant use of local CCS toolstone and the emphasis placed on the hunting of small mammals, shows that these occupations were largely focused on resources available in the local area and not on outlying resource patches accessed by logistically organized forays.

26HU5621 SITE REPORT

Site 26HU5621, measuring about 317 meters (N/S) × 135 m (E/W), consists of a flaked and ground stone scatter lying in a dune complex bisected by Jungo Road (figs. 45, 46). It includes a concentration of lithic material and fire-

FIGURE 45. 26HU5621 site overview.

affected rock eroding from a dune in the northern portion of the site designated Locus A.

Locus A measures about 12 × 13 m and includes a 2 × 2 m fire-affected rock cluster (Feature 1) consisting of about 40 rocks and several associated flakes. Most of the data-recovery effort at 26HU5621 was centered within or near Locus A.

Soils at the site consist of alluvium from mixed rock sources and lacustrine sediments, and aeolian sands in dunes, as well as interdunal and deflationary areas. Vegetation, some of which stabilizes the coppice dunes, mainly consists of greasewood, shadscale, hopsage, and saltgrass. Disturbances include the aforementioned Jungo Road, as well as some evidence of looting, as indicated by several "pot hunter" flake piles.

Field Methods

The initial phase of fieldwork included remapping of the site, documentation of all surface artifact concentrations and features, surface collection of all tools, and mechanical excavation of three backhoe trenches. Subsequent work included the excavation of two grid exposures (1 and 2). Grid 1, measuring 2 × 2 m, was situated within a cluster of fire-affected rock (Feature 2) discovered in a backhoe trench (Backhoe Trench 1) just south of Locus A. Grid 2, measuring 5.0 × 5.0 m, was placed at Feature 1 in Locus A (fig. 46: Detail Map 1). Two subsequent subsurface features were identified in this exposure: Feature 2-1 described as a hearth, and Feature 2-2, an artifact cluster. Each grid exposure was excavated as a series of contigu-

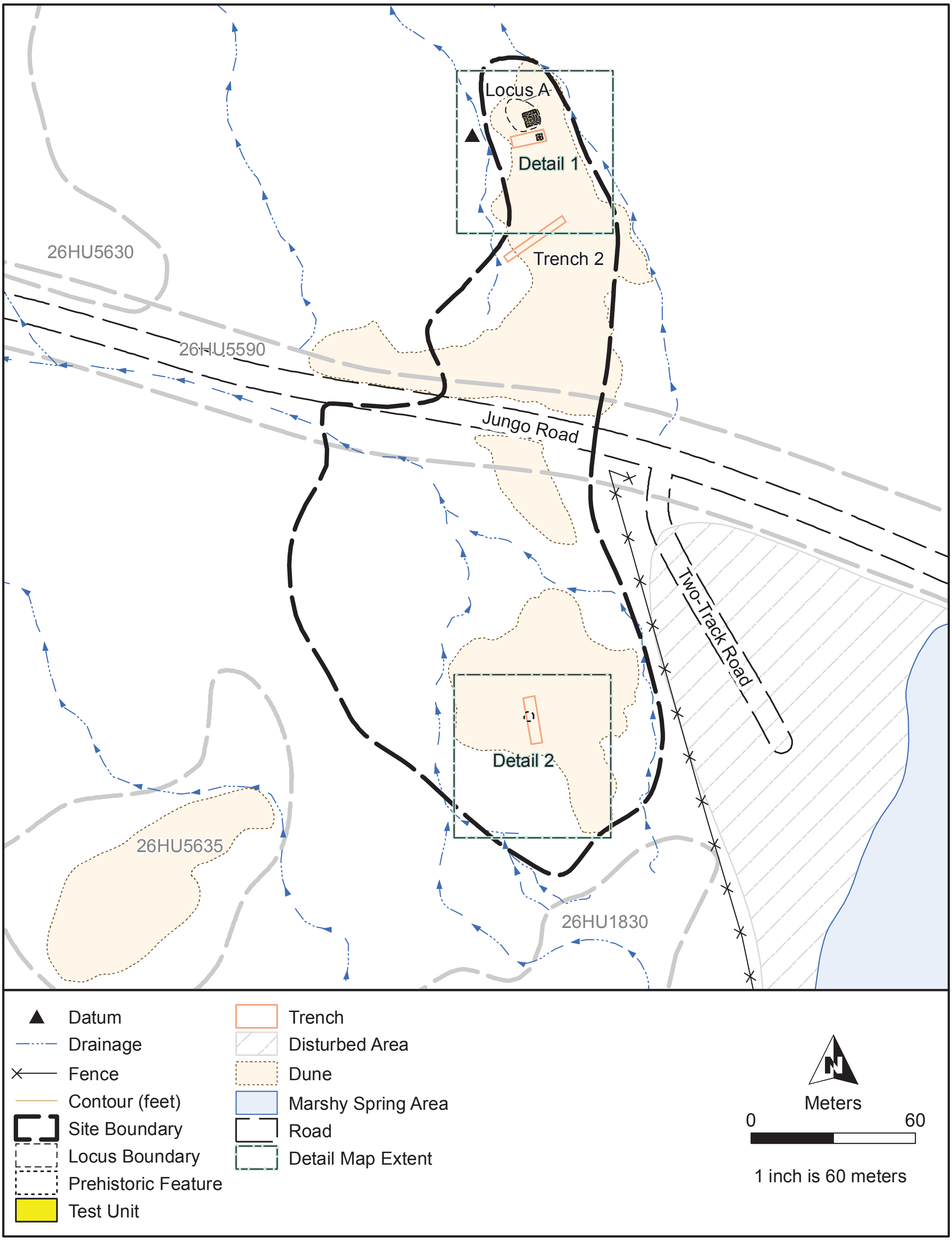
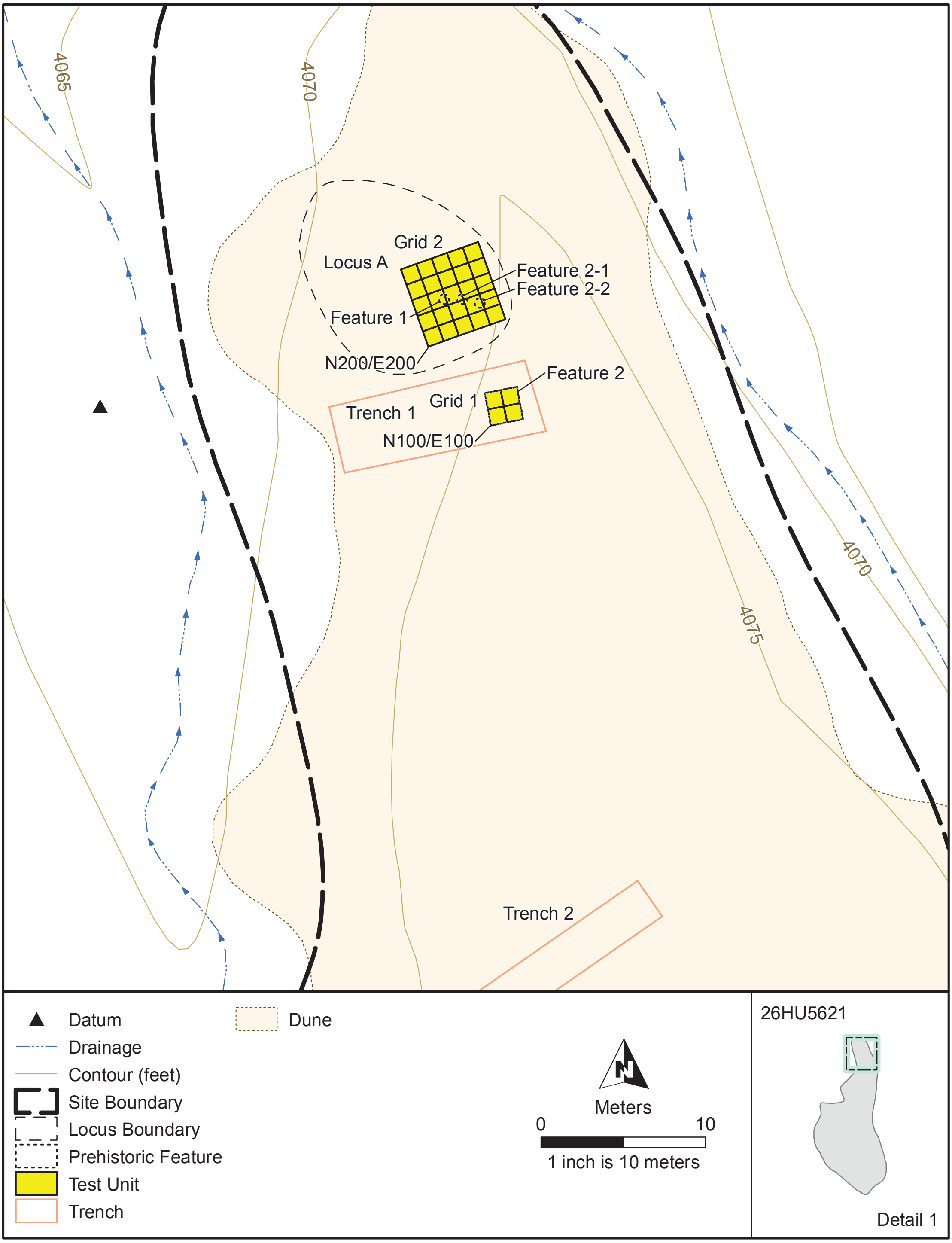


FIGURE 46. 26HU5621 sketch map.



[FIGURE 46 (*continued*). 26HU5621 sketch map, Detail 1.

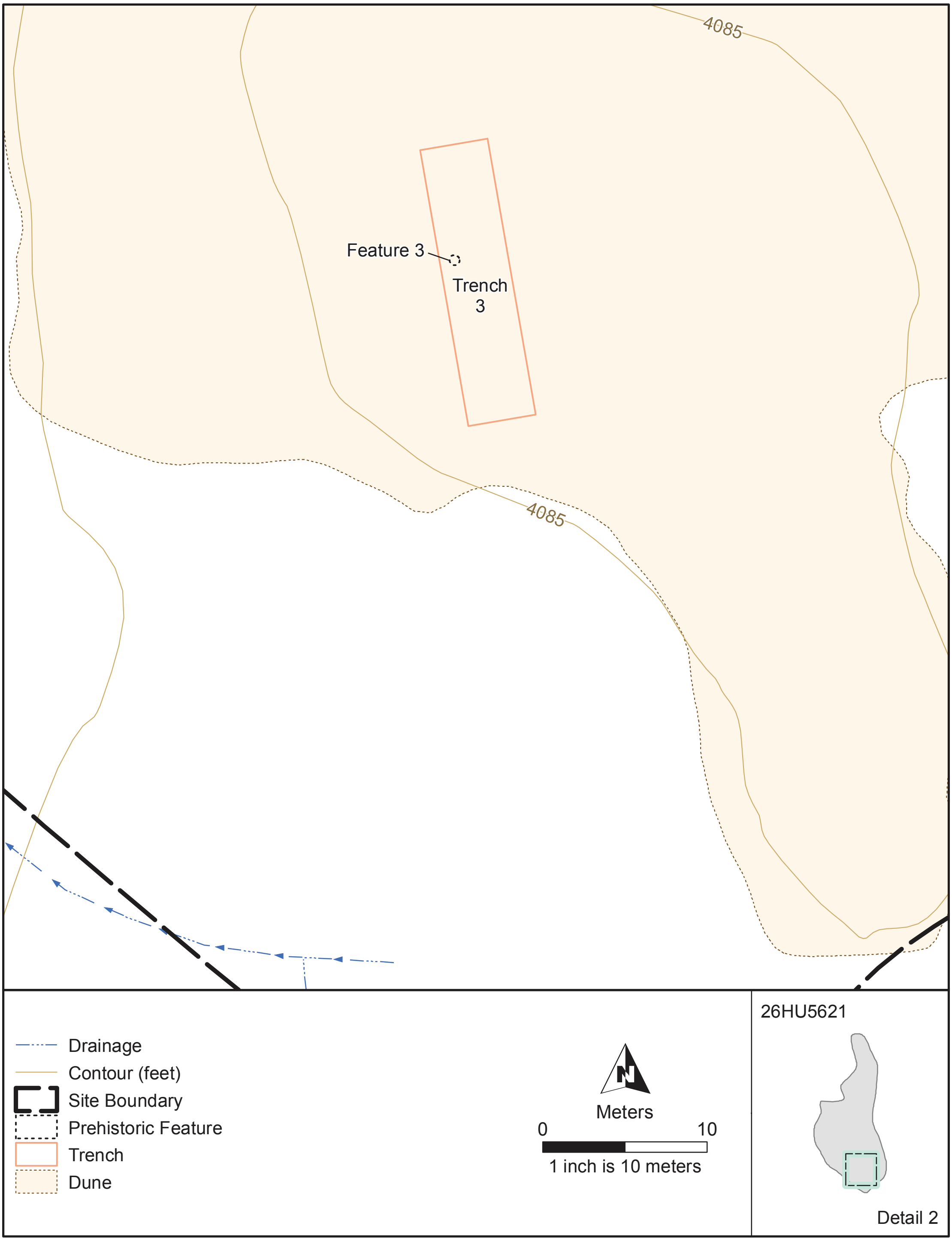


FIGURE 46 (*continued*). 26HU5621 sketch map, Detail 2.

TABLE 50
Excavation Summary for 26HU5621

Test Unit (TU)	Locus	Unit Location	Unit Size (m)	Late Archaic A (m^3)	Noncomponent (m^3)	Total (m^3)
N100/E100	Nonlocus	Grid 1, Trench 1	1 × 1	–	0.52	0.52
N100/E101	Nonlocus	Grid 1, Trench 1	1 × 1	–	0.70	0.70
N101/E100	Nonlocus	Grid 1, Trench 1	1 × 1	–	0.70	0.70
N101/E101	Nonlocus	Grid 1, Trench 1	1 × 1	–	0.65	0.65
N200/E200	A	Grid 2	1 × 1	0.52	–	0.52
N200/E201	A	Grid 2	1 × 1	0.66	–	0.66
N200/E202	A	Grid 2	1 × 1	0.79	–	0.79
N200/E203	A	Grid 2	1 × 1	1.13	–	1.13
N200/E204	A	Grid 2	1 × 1	1.16	–	1.16
N201/E200	A	Grid 2	1 × 1	1.04	–	1.04
N201/E201	A	Grid 2	1 × 1	0.73	–	0.73
N201/E202	A	Grid 2	1 × 1	0.87	–	0.87
N201/E203	A	Grid 2	1 × 1	1.09	–	1.09
N201/E204	A	Grid 2	1 × 1	1.43	–	1.43
N202/E200	A	Grid 2	1 × 1	0.72	–	0.72
N202/E201	A	Grid 2	1 × 1	0.78	–	0.78
N202/E202	A	Grid 2	1 × 1	0.87	–	0.87
N202/E203	A	Grid 2	1 × 1	1.29	–	1.29
N202/E204	A	Grid 2	1 × 1	1.39	–	1.39
N203/E200	A	Grid 2	1 × 1	0.55	–	0.55
N203/E201	A	Grid 2	1 × 1	0.68	–	0.68
N203/E202	A	Grid 2	1 × 1	0.78	–	0.78
N203/E203	A	Grid 2	1 × 1	1.07	–	1.07
N203/E204	A	Grid 2	1 × 1	1.14	–	1.14
N204/E200	A	Grid 2	1 × 1	0.87	–	0.87
N204/E201	A	Grid 2	1 × 1	0.77	–	0.77
N204/E202	A	Grid 2	1 × 1	0.80	–	0.80
N204/E203	A	Grid 2	1 × 1	0.90	–	0.90
N204/E204	A	Grid 2	1 × 1	1.05	–	1.05
Total				23.08	2.57	25.65

FIGURE 47. 26HU5621 photographic cross section of Trench 1.

ous 1 × 1 m control units. A total of 29 m^2 of block exposure was hand-excavated at the grid exposures, totaling 25.65 m^3 of deposit (see table 50).

Site Structure and Chronology

Site 26HU5621 is situated on a sandsheet and north-south trending dune at the northeastern edge of the Sulphur Springs dune field. Three exploratory trenches at 26HU5621 documented the stratigraphic setting of the site and provided the opportunity to search for cultural features. The stratigraphy observed in the trenches is similar to other project-area dune sites with regard to character of deposit, number of depositional units, soils, and substrate (where exposed). The deposits consist of fine-to-medium-grained, subangular to subrounded sand. A small percentage of the sand grains are frosted, indicative of aeolian reworking of locally derived fluvial sand.

Typically a thin mantle of recent sand (Stratum III) is present on the dunes (figs. 47, 48). This upper deposit displays cross-bedding and local silt and clay laminations at the contact with the underlying depositional unit. The upper deposit is typically turbated by burrowing animals, plants, and various insects. This stratum often shows a weakly developed A horizon over unweathered parent material (C horizon).

The underlying Stratum II consists of similar aeolian sediment. Sedimentary structures are blurred in this deposit and no cross-bedding or soil development is evident. The upper portion may have been eroded after deposition such that only a Ck horizon remains on the stratum across the site area. In the area of archaeological grids 1 and 2, Stratum II rests abruptly on Stratum I, with a lower contact approximately one meter below the modern surface along the dune crest (figs. 47, 48). The package thins gradually toward the windward dune side but forms a

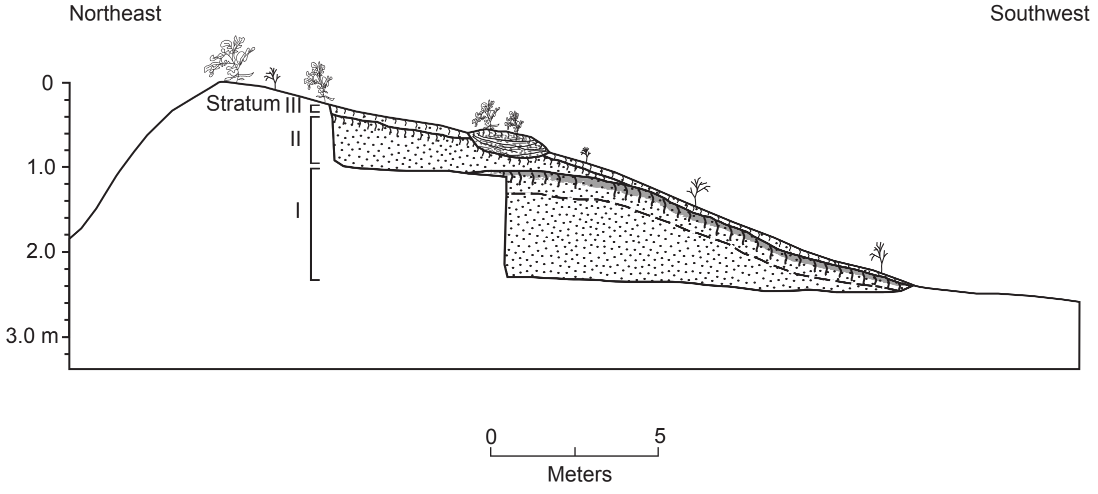


FIGURE 48. 26HU5621 schematic cross section of Trench 1. Based on original illustration courtesy of Thomas F. Bullard.

massive sandy stratum deposited in the Late Holocene. Archaeological features and deposits associated with this stratum at Grid 1 and Grid 2 appear to date mostly to the Late Archaic Period (see Component Definition).

Stratum I is likewise similar to other areas where the playette-dune interface influences the character of the lowest stratum. A weak to moderate soil consisting of Bwkb and Ckb horizons is formed at the top of the stratum. The soil is recognized by weak to moderately blocky structure, very slight reddening, and the common presence of a narrow zone of bioturbation parallel to the contact, presumably the former land surface. Stratum I deposits are slightly indurated, and thin laminations of silt and clay interfinger with aeolian sediment of the dune front. This stratum likely predates the local archaeological assemblage, but activity at the dune interface may have been active in the Middle Holocene, based on evidence from elsewhere in the dune field.

Features: Four features, two surface and two subsurface, were documented at 26HU5621. Features 1 and 2 were investigated at Grid 2 and Grid 1, respectively, but neither feature had intact subsurface deposits. They are most likely deflated thermal features, possibly hearths. Two subsurface features were documented as part of the Grid 2 exposure; these are described in greater detail below.

Feature 2-1. Feature 2-1 was found in Units 202N/203E and 203N/203E, 14 cm below the modern ground surface. The feature was in fair condition, although burrowing rodent disturbance was noted. It was amorphous in plan and shallow basin shaped in profile, measuring 75 × 55 cm across and 9 cm deep. The feature fill consisted of semicompact, fine-to-coarse-grained sand with charcoal flecking and staining. Contents consisted of 17 fire-affected rock fragments, a CCS biface fragment, and a small number of CCS flakes. A radiocarbon date of 1300 cal b.p. (median probability [Beta-378749]) was obtained from the feature.

Feature 2-2. Feature 2-2 is a discrete flake and tool cluster documented in Unit 202N/204E of Grid 1, 29 cm below the modern ground surface. The feature was amorphous in plan and profile but measured 66 × 59 cm across and about 4 cm deep (fig. 49). The feature contains a remarkable 2747 flakes, the vast majority CCS with some obsidian and quartzite, as well as nine CCS bifaces (fragmentary and complete) and one core. Field excavators interpreted the feature as an artifact of "housecleaning" and

FIGURE 49. 26HU5621 Feature 2-2 flake and tool cluster.

"maintenance of space" (see Binford, 1978), but a cache or lithic workshop area is also possible. The feature is located less than a meter from Feature 2-1 and is likely associated with it, although no dateable artifacts or materials were recovered.

Feature 3. Feature 3 is a rock ring measuring 1.5 × 2.1 m, as plotted on the site map, but no additional information about the feature was provided in documentation of the site.

Component Definition: The small assemblage of projectile points recovered from the site, consisting of Gatecliff, Elko, and Rosegate-series projectile points (table 51), indicates some level of site use from the Early Archaic through the Late Archaic periods. Our interest, however, lies more in the Grid 2 Exposure, including Features 2-1 and 2-2, as almost all of the excavated assemblage from the site comes from this area. Anchoring the Grid 2 chronology is the radiocarbon assay of Feature 2-1, which returned a Late Archaic date of 1300 cal B.P. The projectile point data from Grid 2 is both thin and equivocal represented only by two points, one Elko and a Rosegate variant. Given this mix of Middle and Late Archaic point forms, we are inclined to put greater emphasis on the intact feature inventory, which indicates a Late Archaic occupation of Grid 2. Given the radiocarbon date of 1300 cal B.P., it is assigned to the Late Archaic A interval to be consistent with findings from 26HU1830 and 26HU3118, which also date to the early part of the Late Archaic. Grid 1 is bereft of chronological data and is assigned to noncomponent status.

TABLE 51
Projectile Point Assemblage from 26HU5621
CCS = cryptocrystalline silicate.

Projectile Point	Late Archaic A		Noncomponent	Total
	Obsidian	CCS	Obsidian	
Gatecliff	–	–	1	1
Elko	1	–	1	2
Rosegate	–	1	–	1
Indeterminate arrow	–	–	1	1
Total	1	1	3	5

Assemblage

Although more than 12,000 items were recovered from 26HU5621, the assemblage consists almost entirely of debitage and only a handful of tools were recovered (table 52). As most of the excavation was conducted at Grid 2, the assemblage is almost entirely of Late Archaic vintage (table 53). The assemblage is reviewed below, segregated by component and tool class.

Late Archaic A Component: *Projectile Points*. Only two projectile points, Elko and Rosegate variants, were recovered from this component. The former is fashioned from obsidian and longitudinally split, forming lengthwise half fragment, and the latter is a complete CCS specimen.

Bifaces. A total of 31 bifaces was recovered from Late Archaic contexts at the site, 28 fashioned from CCS and the remainder from obsidian (table 54). In a trend observed at other project sites, the CCS bifaces are represented by a range of production stages, whereas obsidian bifaces are exclusively finished items. The former most likely reflects local procurement and processing of lithic materials, while the latter were probably transported onto the site as finished items.

Flake Tools. Two formed flake tools and five simple flake tools were recovered from Late Archaic contexts (table 54). The formed flake tools consist of both obsidian and CCS specimens; the former fashioned from a cortical flake blank, the latter from an interior flake. The simple flake tools include obsidian, CCS, and quartzite specimens. The two obsidian artifacts are fashioned from biface-thinning flakes, and the two CCS specimens from a chunk blank and an interior flake blank. The quartzite flake tool is a cortical flake blank. As a group, these tools suggest a range of cutting and scraping tasks.

Cores. Four cores were found in the Late Archaic component, three fashioned from CCS, the other from obsidian (table 54). The CCS specimens include both bidirectional and multidirectional flake-removal patterns. The obsidian core is multidirectional. There are significantly more production bifaces in Late Archaic components than cores; similarly, biface production is indicated in the technological profile of the debitage.

Debitage. The debitage profile from Late Archaic contexts is dominated by CCS (86%) followed by obsidian (14%), with trace amounts of fine-grained volcanics and quartzite (table 55). The predominance of CCS is in keeping with other components dating to this time frame, and indicates a preference for more locally available toolstone. As mentioned above, the technological profile of flake types is weighted toward biface thinning for both obsidian and CCS. Notwithstanding its exact function, the debitage concentration documented at Feature 2-2 also points to the importance of CCS reduction at the site.

Milling Equipment. Three millingstone fragments are associated with the Late Archaic component at the site. These are all manufactured from felsite and are characterized as thin slabs. All exhibit unifacial surface wear, although shape and surface-wear type could not be determined.

TABLE 52
Artifact Inventory Summary from 26HU5621

		Feature	Flaked Stone						Ground Stone			Misc. Prehistoric Items	Faunal Remains	Historics	
			Projectile Point	Biface	Formed Flake Tool	Flake Tool	Core	Debitage	Millingstone	Handstone	Battered Cobble	Manuport	Bone	Metal	Total
Surface artifacts			3	8	–	1	–	5	3	2	1	2	–	–	25
Feature															
Feature 2-1	Grid 2 N202–203/E203	2-1	–	1	–	–	–	37	–	–	–	–	–	–	38
Feature 2-2	Grid 2 N202/E204	2-2	–	9	–	–	1	2748	–	–	–	–	–	–	2758
TU N200/E202	Grid 2	3	–	–	–	–	–	1	–	–	–	–	–	–	1
Grid 1 test units (TU)															
N100/E100	Grid 1, Trench 1	–	–	–	–	–	–	8	–	–	–	–	3	–	11
N100/E101	Grid 1, Trench 1	–	–	–	–	–	–	10	–	–	–	–	14	–	24
N101/E100	Grid 1, Trench 1	–	–	–	–	–	–	32	–	–	–	1	–	–	33
N101/E101	Grid 1, Trench 1	–	–	–	–	–	–	26	–	–	–	–	1	–	27
Grid 2 test units (TU)															
N200/E200	Grid 2	–	–	–	–	–	–	79	–	–	–	–	–	–	79
N200/E201	Grid 2	–	–	1	–	–	–	230	1	–	–	–	–	–	232
N200/E202	Grid 2	–	–	5	–	1	–	735	–	–	–	–	1	–	742
N200/E203	Grid 2	–	–	–	–	–	–	491	–	–	–	–	6	–	497
N200/E204	Grid 2	–	–	1	–	–	–	166	–	–	–	–	7	–	174
N201/E200	Grid 2	–	–	–	–	–	–	108	–	–	–	–	–	3	111
N201/E201	Grid 2	–	–	–	–	–	–	189	–	–	–	–	–	–	189
N201/E202	Grid 2	–	–	1	–	–	1	208	–	–	–	–	15	–	225
N201/E203	Grid 2	–	–	1	–	–	–	371	1	–	–	–	7	–	380
N201/E204	Grid 2	–	–	–	–	2	1	625	–	–	–	–	1	–	629

TABLE 52 (*Continued*)

			Flaked Stone						Ground Stone			Misc. Prehistoric Items	Faunal Remains	Historics	
		Feature	Projectile Point	Biface	Formed Flake Tool	Flake Tool	Core	Debitage	Millingstone	Handstone	Battered Cobble	Manuport	Bone	Metal	Total
N202/E200	Grid 2	–	–	1	–	–	–	116	–	–	–	–	–	–	117
N202/E201	Grid 2	–	–	1	–	–	–	131	–	–	–	1	–	–	133
N202/E202	Grid 2	–	–	–	–	–	–	465	–	–	–	–	1	–	466
N202/E203	Grid 2	–	1	1	–	–	–	696	–	–	–	–	2	–	700
N202/E204	Grid 2	–	–	1	1	–	–	1880	–	–	–	–	–	–	1882
N203/E200	Grid 2	–	–	1	–	1	–	164	–	–	–	–	–	–	166
N203/E201	Grid 2	–	–	–	–	–	–	143	–	–	–	–	–	–	143
N203/E202	Grid 2	–	–	–	–	–	–	282	–	–	–	–	1	–	283
N203/E203	Grid 2	–	–	3	–	–	–	586	–	–	–	–	4	–	593
N203/E204	Grid 2	–	–	2	–	–	1	599	–	–	–	–	–	–	602
N204/E200	Grid 2	–	–	1	–	1	–	41	–	–	–	–	5	–	48
N204/E201	Grid 2	–	–	–	–	–	–	67	–	–	–	–	–	–	67
N204/E202	Grid 2	–	1	–	–	–	–	153	–	–	–	–	–	–	154
N204/E203	Grid 2	–	–	1	–	–	–	403	–	–	–	–	–	–	404
N204/E204	Grid 2	–	–	–	1	–	–	251	1	–	–	–	4	–	257
Wall Cleanup	Grid 2	–	–	–	–	–	–	2	–	–	–	–	5	–	7
Wall Cleanup Grid 2	N201–202/E204	–	–	–	–	–	–	7	–	–	–	–	–	–	7
Trench															
Trench 2	–	–	–	–	1	–	–	21	–	–	–	–	–	–	22
Trench 3	–	–	–	–	–	–	–	–	1	–	–	–	3	–	4
Total			5	39	3	6	4	12,076	7	2	1	4	80	3	12,230

TABLE 53
Artifact Inventory Summary from 26HU5621 by Component

Type	Late Archaic A	Noncomponent	Total
Flaked stone			
Projectile point	2	3	5
Biface	31	8	39
Formed flake tool	2	1	3
Flake tool	5	1	6
Core	4	-	4
Debitage	11,974	102	12,076
Ground stone			
Millingstone	3	4	7
Handstone	–	2	2
Battered cobble	–	1	1
Faunal remains			
Bone	59	21	80
Total	12,080	143	12,223

A more sizeable collection of milling equipment was documented on the surface of the site in noncomponent areas, but these remain undated. Together, these data point to the importance of plant processing at the site.

Faunal Remains. Only a small number of faunal remains were recovered from Late Archaic contexts at the site (table 56). All the identifiable elements are from small- and medium-sized mammals, mostly ground squirrels, pocket gophers, jackrabbits, and other nonspecified rodents. The unidentifiable assemblage mirrors this profile. Artiodactyls and large-sized mammals are mostly absent. Late Archaic hunting profiles, at least at this site, were limited to smaller animals.

Noncomponent Areas: Much of the noncomponent assemblage was documented from the surface of the site and includes a variety flaked and ground stone tools. Noteworthy are three projectile points, which include Gatecliff and Elko variants as well as an arrow-sized point, all suggesting site visitation over a long time span. Noncomponent bifaces show a similar profile to the Late Archaic assemblage, with CCS specimens exhibiting a range of stages while obsidian bifaces are limited to Stage 5 finished implements. The noncomponent milling equipment includes two handstones, which were absent in the Late Archaic component; both are ovate in shape and planoconvex in section. Also found were three millingstones and a battered cobble. The former have relatively flat, unifacial surface wear and are slightly shaped. The battered cobble is fashioned from felsite, is circular in shape, and exhibits zones of pecking. Also documented from noncomponent context was a formed flake tool and a simple flake tool.

Site Summary

Although 26HU5621 received some sporadic visitation during the Early and Middle Archaic, it appears to have been most intensively occupied during the Late Archaic, perhaps at the early end of this period, ca. 1300 B.P. (i.e., Late Archaic A). The Late Archaic A component is bereft of the house structures observed at several other project sites, suggesting a diminution in habitation. Although a number of ground stone processing tools were documented from undated surface contexts at the site, this assem-

TABLE 54
Flaked Stone Tool Inventory from 26HU5621
CCS = cryptocrystalline silicate.

Type	Late Archaic A			Non-component		Total
	Obsidian	CCS	Quartzite	Obsidian	CCS	
Biface						
Stage 2	–	5	–	–	1	6
Stage 3	–	11	–	–	1	12
Stage 4	–	6	–	–	3	9
Stage 5	2	–	–	2	1	5
Indeterminate stage	1	6	–	–	–	7
Subtotal	3	28	–	2	6	39
Formed flake tool						
Interior flake blank	–	1	–	–	–	1
Cortical flake blank	1	–	–	–	–	1
Flake blank	–	–	–	1	–	1
Subtotal	1	1	–	1	–	3
Average number of modified edges	1.0	1.0	–	2.0	–	1.3
Flake tool						
Biface-reduction flake blank	2	–	–	–	–	2
Interior flake blank	–	1	–	–	1	2
Cortical flake blank	–	–	1	–	–	1
Chunk blank	–	1	–	–	–	1
Subtotal	2	2	1	–	1	6
Average number of modified edges	1.5	1.0	3.0	–	1.0	1.5
Core						
Bidirectional	–	1	–	–	–	1
Multidirectional	1	2	–	–	–	3
Subtotal	1	3	–	–	–	4
Total	7	34	1	3	7	52

blage class was limited in Late Archaic A contexts. Some plant-processing activity, however, is suggested by the thermal features observed in both surface and subsurface contexts at Grid 2 (features 1, 2-1, and 2-2).

By and large, the Late Archaic A assemblage is dominated by CCS flaked stone reduction debris. This seems geared more toward lithic production, as there are comparatively few hunting implements and very little faunal material that might indicate a hunting pose. This is evinced by a spatially discrete tool and debitage concentration (Feature 2-2), which may represent a cache or lithic workshop area.

Not surprisingly, CCS bifaces are represented by a range of production stages suggestive of local toolstone procurement and production. Flaked stone technological profiles for CCS show a trend for reduction. As we have noted at several other project sites, the transition to more locally available CCS appears to distinguish the Late Archaic Period. As CCS comprises 86% of the Late Archaic debitage at the site, this pattern appears to hold at 26HU5621.

TABLE 55
Debitage Analysis from 26HU5621
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic.

Debitage	Late Archaic A				Noncomponent			Total
	Obsidian	CCS	FGV	Quartzite	Obsidian	CCS	FGV	
Diagnostic								
Core reduction	3	7	–	–	–	–	–	10
Core reduction/flake tool production	2	3	–	–	–	–	–	5
Biface production	33	209	–	–	–	–	–	242
Tool finishing/resharpening	7	23	–	–	–	1	–	31
Nondiagnostic								
General percussion	8	87	–	–	–	–	–	95
Indeterminate type	6	184	–	–	–	–	–	190
Not analyzed	1376	10,004	13	9	34	66	1	11,503
Total	**1435**	**10,517**	**13**	**9**	**34**	**67**	**1**	**12,076**

TABLE 56
Faunal Remains from 26HU5621

Common Name	Taxon	Late Archaic A		Noncomponent		Total	
		Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
Mammal							
Hare, black-tailed	*Lepus californicus*	4	0.47	–	–	4	0.47
Pocket gopher, Bottae's	*Thomomys bottae*	1	0.42	–	–	1	0.42
Rat, langaroo	*Dipodomys* spp.	1	0.05	–	–	1	0.05
Squirrel/chipmunk	Sciuridae	19	1.39	–	–	19	1.39
Rodent, indeterminate	Rodentia, indeterminate	6	0.18	–	–	6	0.18
Mammal, large	Mammalia, large	1	0.07	16	1.90	17	1.97
Mammal, medium	Mammalia, medium	6	0.53	–	–	6	0.53
Mammal, small	Mammalia, small	6	0.10	1	0.01	7	0.11
Mammal, indeterminate	Mammalia, indeterminate	15	0.26	4	0.09	19	0.35
Total		59	3.47	21	2.00	80	5.47

SUMMARY AND CONCLUSIONS

Archaeological findings from the study area reflect a dynamic history of subsistence and settlement-pattern change spanning the entire Holocene. Prior to about 4500 years ago, occupations appear to have been sporadic, with people making brief visits to the area during periods of increased effective moisture, and largely avoiding it for more promising areas during times of drought. Archaeological visibility increases significantly after 4500 cal B.P., including periods when substantial houses were constructed, and people supplemented the local resource base with foods and materials obtained from distant locations possessing richer concentrations of large game and obsidian toolstone. These more intensive habitations were not constant, however, and also seem to be linked to local cycles of effective moisture.

The following discussion provides a summary of these findings, beginning with a general review of the settlement chronology and its possible relationship to climatic change. We then provide a more detailed accounting of the artifact, feature, and faunal assemblages from each of our single-component areas, giving special attention to changing approaches to house construction and other structural aspects of the deposits. Finally, we end with a more synthetic treatment of our findings, placing them within the larger prehistoric context of the northwest Great Basin, giving special focus to a variety of research issues that are at the forefront of current archaeological study within the region.

Settlement Chronology

We begin our investigation of land-use shifts by observing changes in the frequency of time-sensitive projectile points and radiocarbon dates over time. The frequency of both data sets are largely consistent with one another, but there are significant differences between them with regard to their chronological resolution, with radiocarbon dates being much more accurate than projectile points. Thomas (2011) aptly suggests that projectile points are like the hour hands of a clock, measuring time on a gross level; obsidian hydration values (not available here) are somewhat more precise, comparable to the minute hand; while radiocarbon assays are like the second hand, measuring time with the greatest precision of all.

Our projectile point sample provides the coarse-grained end of the chronological continuum. It begins with a robust collection of Great Basin Stemmed points, numbering 19 specimens (fig. 50). These forms typically date to the Paleoarchaic Period (12,800–7800 cal B.P.) but, as noted in Cultural Context, there is a growing body of evidence indicating that they might be coeval with or even predate Clovis. Irrespective of their exact age, the vast majority recovered from the northern Great Basin seem to be associated with marshland habitats that existed prior to the warm-dry conditions of the Middle Holocene (Beck and Jones, 1997, 2009). Although the current sample also lacks precise dating (the points are either scattered across undated contexts or found in deposits containing materials dating to multiple time periods), their location along the southeastern shores of Black Rock Desert playa is consistent with the wetland adaptations documented elsewhere in the Great Basin.

Northern Side-notched points date primarily to the Post-Mazama Period (7800–5700 cal B.P.). This interval overlaps significantly with the Middle Holocene Climatic Optimum, dating between about 8500–6300 cal B.P. Despite the adverse conditions that occurred during large portions of this interval, Northern Side-notched points are quite common in much of the northern Great Basin, especially in places like the High Rock County where they were found in equal frequencies to Great Basin Stemmed points by Layton (1985). Northern Side-notched points outnumber Great Basin Stemmed points by two to one along the Ruby Pipeline corridor (Hildebrandt et al., 2016), and they are found in even greater proportions farther north in the Massacre Lake region (Leach, 1988). But this is not the case in

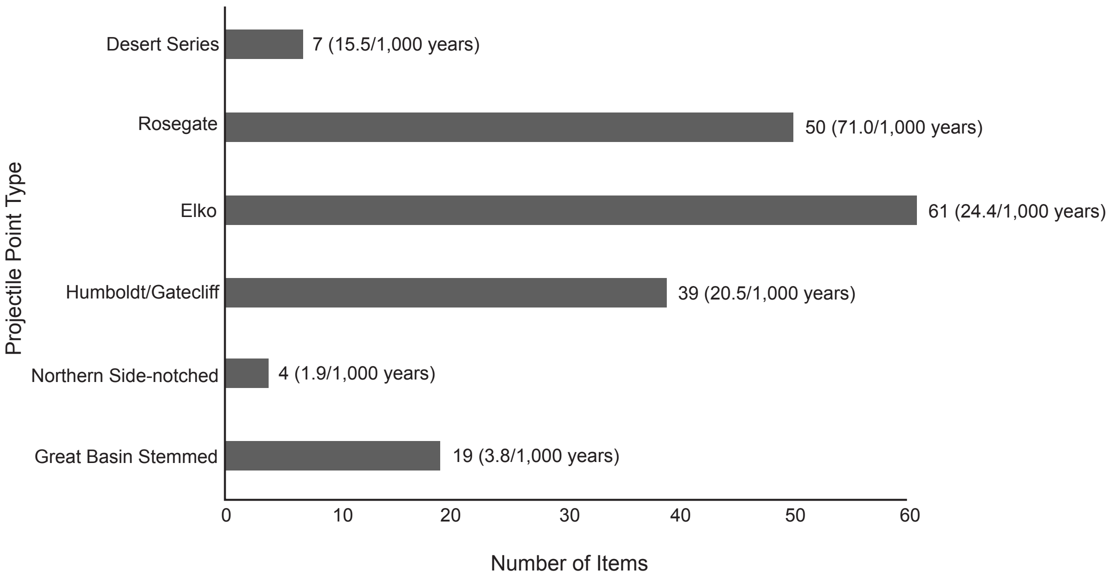


FIGURE 50. Frequency of time-sensitive projectile points in the study area.

the current study area where only four Northern Side-notched points were found (or 1.9 items per 1000 years), being outnumbered by Great Basin Stemmed points by almost five to one (fig. 50). It seems clear then, that the study area was not a productive place to be during this time of increased aridity.

Coming out of the latter half of the Middle Holocene, climate tended to be cooler and wetter, especially between about 5700 and 2600 cal B.P. (see Rhode, 2016), after which drought conditions returned. Humboldt Concave Base and Gatecliff Split Stem points, which roughly correspond to the Early Archaic Period (5700–3800 cal B.P.) and the onset of these more amenable conditions, explode in abundance, numbering 39 specimens (20.5 items per 1000 years). This is also the age of the earliest single-component deposit discovered within the project area. Increasing frequencies of projectile points continue into the Middle Archaic Period (3800–1300 cal B.P.) with the recovery of 61 Elko points (24.4 items per 1000 years). This interval also produced three single-component areas, as well as the first evidence for major, long-term habitation in the local area. Given that Elko points lack the resolution to be assigned to temporal segments more refined than the Middle Archaic as a whole, they have little input on determining levels of settlement intensity that occurred between 2600 and 1700 cal B.P. when conditions were much drier than was the case in the earlier parts of the Middle Archaic Period.

Rosegate points correspond to the Late Archaic Period (1300–600 cal B.P.), with the latter part encompassing the drought events associated with the MCA (1100–650 cal B.P.). They number 50 specimens, showing an increase to 71 items per 1000 years. This interval also produced six single-component areas. But Rosegate points, similar to Elko points, lack the temporal resolution required to measure potential variability in land-use intensity before versus during the MCA, not to mention the brief interdrought period of cool-wet conditions during the MCA that occurred between about 900 and 800 cal B.P. (Rhode, 2016).

Desert-Series points (i.e., Desert Side-notched and Cottonwood) postdate the MCA and correspond to the Terminal Prehistoric Period (post-600 cal B.P.). Although this interval includes cool-wet conditions (including the Little Ice Age) interspersed with short periods of drought, the frequency of Desert Series points is quite low, numbering only seven items (15.5 items per 1000 years). The low frequency of this point form in the northwest Great Basin, although surprising given ameliorating climate (compared to the MCA) and the hypothesized arrival of Numic-speaking populations at this time (Bettinger and Baumhoff, 1982; Bettinger, 2015) is actually not unusual. Although there are a few places where Desert series points are found in abundance (Ataman and Drews, 1992), most large-scale data sets are similar to those presented here. As will be discussed in more detail below (see The Missing Terminal Prehistoric Record), the low visibility of Terminal Prehistoric Period is probably due to a variety of factors, including an archaeological record reflecting a dispersion of small family bands exploiting habitats rarely used before, and a rather late arrival of these Numic-speaking peoples into the northern Great Basin.

The general patterns produced by the projectile points are clarified by the radiocarbon dates, providing a consistent and much more accurate picture of local land-use pattern change (see table 9). First, our earliest cultural date of 7800 cal B.P. corresponds to the transition between the Paleoarchaic and Post-Mazama periods, and predates the most severe droughts of the Middle Holocene. The next date is not until 4475 cal B.P. (fig. 51), well after the Middle Holocene Climatic Optimum, and it corresponds to the onset of the Late Holocene. More importantly, however, the next set of radiocarbon dates corresponds to the Middle Archaic, with eight of the nine assays falling between about 3700 and 2900 cal B.P., prior to the period of severe drought between 2600 and 1700 cal B.P. The one exception (1880 cal B.P.) falls toward the end of the interval. (See Rhode et al., 2014, for a discussion of some of the sample-size and statistical issues surrounding the use of radiocarbon metadata to model regional occupation histories.)

The remaining dates ($n = 31$) form a bimodal distribution, largely corresponding to the Late Archaic Period. Seventeen of these (the earlier cluster) predate the MCA, continuing the climate-settlement intensity theme. The remaining dates ($n = 14$) correspond to the MCA, but, interestingly, seven fall within the brief interval between 900 and 800 cal B.P., when an intense period of moisture occurred (Rhode, 2016). This 100 year period accounts for 22% of the 450 year MCA, but contains 50% of the radiocarbon dates (7.0 dates per 100 years), while the remaining 78% of the MCA contains the other seven dates, producing them at a rate of only 2.0 per 100 years of time. It is also important to note that five of the latter dates fall between 1000 and 900 cal B.P., perhaps indicating that cool-wet conditions may have developed locally somewhat earlier than 900 years ago.

Finally, similar to the projectile points, no radiocarbon dates fall within the Terminal Prehistoric Period, nor were we able to identify a single-component area/assemblage dating to this interval (see The Missing Terminal Prehistoric Record).

Component Summaries

While multiple time periods are represented by the above projectile point assemblage, robust deposits and associated assemblages are limited to five major spatio-temporal components: Early and Middle Archaic, as well as Late Archaic divided into early (Late Archaic A) and late (Late Archaic B) expressions (see Chronological Controls). A more generic Late Archaic component was also identified that cannot be further subdivided into finer temporal intervals. Finally, we also identified a small component composed of a mixture of materials dating to the Middle and Late Archaic periods. Due to the small size and compromised integrity of the assemblage, it figures little in the discussions that follow.

Early Archaic: Early Archaic deposits were recognized at only one site, 26HU2871 (see table 10 for projectwide distribution of single components). The assemblage is largely limited to hunting-related, flaked stone tools (projectile points, bifaces, cores, formed flake tools and simple flake tools). Projectile points are dominated by Gatecliff

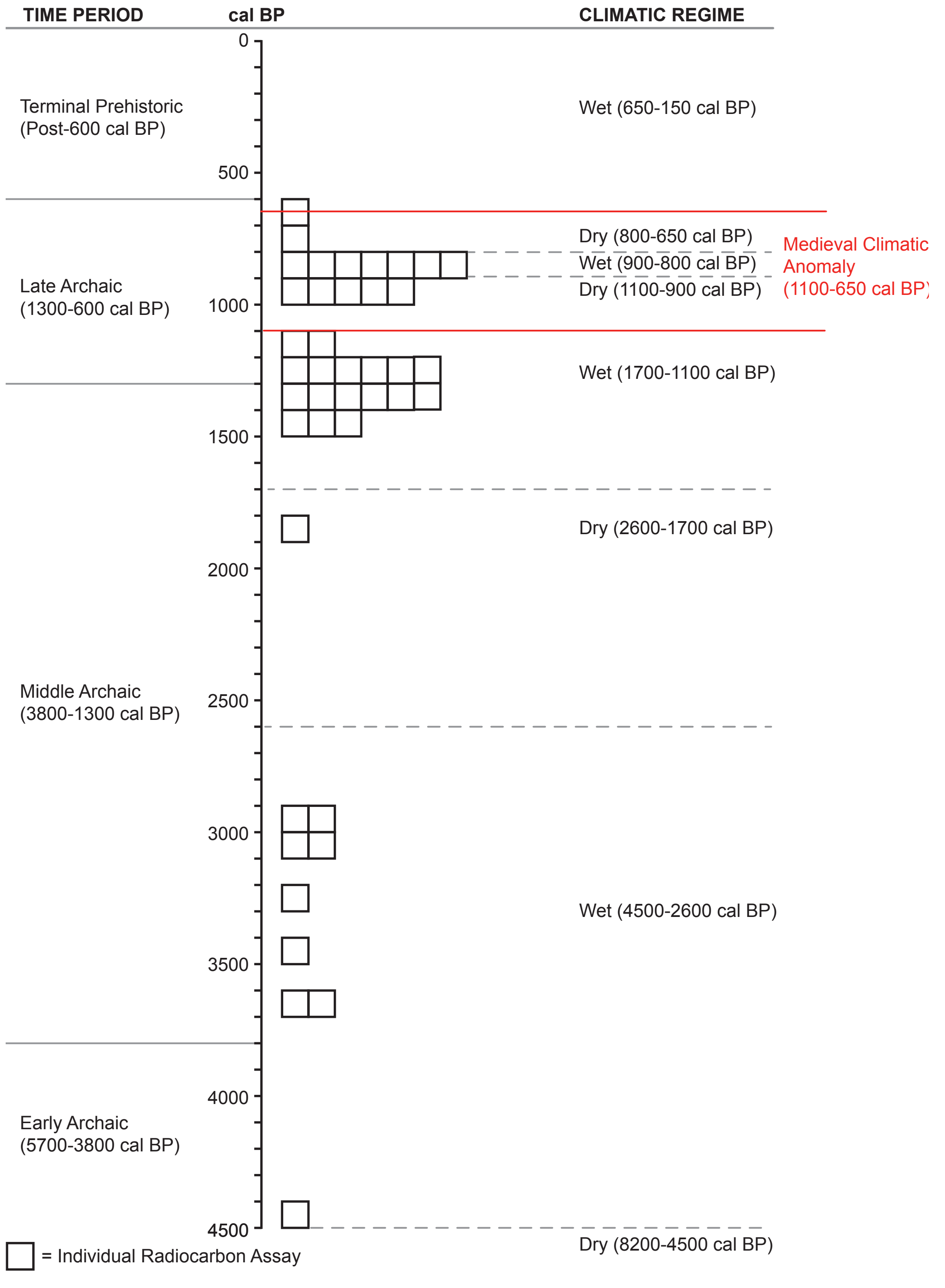


FIGURE 51. Frequency of radiocarbon dates by time period and climatic regime.

and Humboldt series variants. Noteworthy is the complete absence of processing features, milling equipment, and other processing tools that are in abundance in later-dating components (table 57).

The emphasis on hunting, particularly large game, is indicated in the faunal profile from this component where artiodactyl remains are found, at the exclusion of any lagomorphs, although the overall sample size is quite small (tables 58, 59).

Toolstone profiles exhibit a decided emphasis on obsidian, which reaches its highest percentage at this time (table 60). Interestingly, most of this obsidian is from distant sources to the north, as the more local Mt. Majuba obsidian comprises only one-third of the small sample of obsidian specimens subjected to XRF analysis (table 61). This profile of more distant obsidian sources suggests a comparatively wide-ranging land-use system.

Early Archaic toolstone production at 26HU2871 is centered on both obsidian and locally available CCS. In a pattern we see in other components, the CCS bifaces include early and middle-stage specimens that reflect the initial processing of this local material (table 62). The obsidian bifaces are mostly finished or near-finished implements, perhaps indicating the transport of previously reduced bifaces to the site for final reduction into finished tools.

In sum, the Early Archaic component has all the appearances of a hunting camp, which distinguishes it from the more eclectic habitation and subsistence activities represented at later-dating components. This hunting appears to have been wide-ranging and directed mostly at large game, as indicated by the presence of exotic obsidians.

Middle Archaic: Middle Archaic deposits were identified at three sites: 26HU1830, 26HU2871, and 26HU5441 (see table 10). Of these, the deposits documented at 26HU1830, Grid 2 Area, dominate the component assemblage totals. Habitation and domestic activities at 26HU1830, in comparison to Late Archaic manifestations of habitation at 26HU1876, Grid 1 Area, are discussed under a separate heading (see Middle versus Late Archaic Domestic/Habitation Patterns).

As previously mentioned, it is important to note that the deposits at 26HU1830, Grid 2 Area, are not simply dated to a generic Middle Archaic time frame, but rather provide a very narrow snapshot of lifeways at about 3000 cal B.P., which corresponds to a more mesic time before the Late Holocene Dry Period (2600 and 1700 cal B.P.).

In contrast to the Early Archaic profile, we see the first good evidence of plant gathering and processing as evidenced by the recovery of a number millingstones, handstones, a mortar, and a variety of miscellaneous ground stone items (see table 57). In addition, the handful of cobble tools and core tools may also be related to plant processing. This appears to be additive to a robust hunting assemblage that includes projectile points (mostly Elko-series variants), bifaces, drills, cores, formed flake tools, and simple flake tools.

The appearance of ground stone and, as we further review below, the documentation of a house structure and living surface, mark the first evidence of actual habitation by larger demographic groups including both men and women. The expansion of habitation is also marked by the appearance of certain nonutilitarian artifacts, such as shell and bone beads, as well as by awls and other modified bone items that signal more domestic activities.

Toolstone profiles show a continued use of obsidian, albeit somewhat reduced from the Early Archaic pattern (table 60). The trend, however, is perhaps more compelling given the vastly larger Middle Archaic sample. Fully 12 separate obsidian sources are represented in the Middle Archaic sample (table 61). By comparison, only seven are included in the Late Archaic sample. Most of these sources are located north and northwest of the project area (across the Black Rock Desert playa). It is at this time, however, that we begin to see the emergence of the more proximal Mt. Majuba as the dominate source for obsidian. Consistent with the preceding periods, we see a continued dominance of late-stage obsidian bifaces in Middle Archaic components, perhaps indicating the transport of previously reduced bifaces to the site for final reduction into

TABLE 57
Assemblage Summary from Single-component Areas

Component Volume (m^3)	Early Archaic 8.17	Middle Archaic 86.61	Middle/Late Archaic Mix 2.86	Late Archaic A 206.40	Late Archaic B 64.26	Late Archaic 3.93	Total 372.22
	Count	Count	Count	Count	Count	Count	Count
Flaked Stone							
Projectile point	8	52	2	30	18	5	115
Biface	14	170	17	308	97	40	646
Drill	–	2	–	1	1	–	4
Formed flake tool	7	63	3	37	9	6	125
Flake tool	12	107	26	102	59	26	332
Cobble tool	–	2	–	1	3	–	6
Core tool	–	1	–	1	–	2	4
Core	6	12	10	30	7	9	74
Tested cobble	–	–	–	–	2	–	2
Debitage	3939	24,456	4214	61,037	18,605	8240	120,491
Ground Stone							
Millingstone	–	8	–	7	20	–	35
Handstone	–	3	–	11	–	–	14
Mortar	–	1	–	–	–	–	1
Anvil	–	5	–	2	–	–	7
Battered cobble	–	8	–	9	–	–	17
Miscellaneous ground stone	–	13	–	2	6	–	21
Miscellaneous prehistoric items							
Bead, shell	–	9	–	29	1	–	39
Bead, bone	–	3	–	–	2	–	5
Awl	–	1	–	1	3	–	5
Modified bone	–	19	–	1	1	1	22
Modified shell	–	–	–	11	–	–	11
Modified stone	–	–	–	–	1	–	1
Faunal Remains							
Bone	45	11,406	52	3176	2507	20	17,206
Total	4031	36,341	4324	64,796	21,342	8349	139,183

TABLE 58
Archaeofaunal Summary from Single-component Areas

Common Name	Taxon	Early Archaic		Middle Archaic		Middle/Late Archaic Mix		Late Archaic A		Late Archaic B		Late		Total	
		Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
Bird															
Falcon/ caracara	Falconiformes	–	–	1	0.04	–	–	–	–	–	–	–	–	1	0.04
Bird, perching	Passeriformes	–	–	1	0.01	–	–	6	0.17	7	0.25	–	–	14	0.43
Bird, indeterminate	Aves, indeterminate	–	–	4	0.43	–	–	4	0.71	5	0.5	–	–	13	1.64
Mammal – artiodactyl															
Deer, mule	*Odocoileus hemionus*	–	–	52	168.82	–	–	1	1.86	–	–	–	–	53	170.68
Cow, domestic	*Bos taurus taurus*	–	–	–	–	–	–	1	26.3	–	–	–	–	1	26.3
Artiodactyl, indeterminate	Artiodactyla, indeterminate	17	2.59	217	92.58	9	1.34	62	10.84	25	8.31	13	1.54	343	117.2
Mammal – carnivore															
Badger, American	*Taxidea taxus*	–	–	–	–	–	–	–	–	2	0.78	–	–	2	0.78
Coyote	*Canis latrans*	–	–	12	23.12	–	–	22	39.92	–	–	–	–	34	63.04
Carnivore, indeterminate	Carnivora, Indeterminate	–	–	24	3.11	1	0.06	–	–	3	0.1	2	0.33	30	3.6
Mammal – lagomorph															
Hare, black-tailed	*Lepus californicus*	–	–	410	84.62	1	0.1	175	29.28	221	32.23	–	–	807	146.23
Hare/rabbit	Leporidae	–	–	88	3.57	–	–	34	1.12	32	1.51	–	–	154	6.2
Mammal – rodent															

TABLE 58 (*Continued*)

Common Name	Taxon	Early Archaic		Middle Archaic		Middle/Late Archaic Mix		Late Archaic A		Late Archaic B		Late		Total	
		Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
Mouse, deer	*Peromyscus* spp.	–	–	–	–	–	–	1	0.03	1	0.02	–	–	2	0.05
Mouse, little pocket	*Perognathus longimembris*	–	–	–	–	–	–	–	–	1	0.01	–	–	1	0.01
Mouse, Western harvest	*Reithrodontomys megalotis*	–	–	–	–	–	–	2	0.04	–	–	–	–	2	0.04
Pocket gopher, Bottae's	*Thomomys bottae*	–	–	–	–	–	–	13	3.56	–	–	–	–	13	3.56
Rat, Kangaroo	*Dipodomys* spp.	–	–	5	0.14	–	–	74	2.54	66	4.56	–	–	145	7.24
Woodrat	*Neotoma* spp.	–	–	1	0.23	–	–	8	1.39	2	0.28	–	–	11	1.9
Squirrel/ chipmunk	Sciuridae	3	0.3	95	5.29	7	0.66	158	9.07	14	0.53	–	–	277	15.85
Rodent, indeterminate	Rodentia, indeterminate	–	–	57	1.01	7	0.13	194	3.63	31	0.87	–	–	289	5.64
Mammal – indeterminate															
Mammal, large	Mammalia, large	3	2	3115	1012.6	3	1.92	343	87.18	63	18.21	2	0.71	3529	1122.62
Mammal, medium	Mammalia, medium	9	1.68	1408	163.89	4	1.17	505	43.82	822	76.89	–	–	2748	287.45
Mammal, small	Mammalia, small	–	–	418	16.56	5	0.09	139	2.63	84	2.09	1	0.04	647	21.41
Mammal, indeterminate	Mammalia, indeterminate	12	0.94	5452	213.81	14	2.75	1248	36.34	1035	28.52	2	0.16	7763	282.52
Reptile															
Iguana	*Iguana* spp.	–	–	–	–	–	–	1	0.01	–	–	–	–	1	0.01

TABLE 58 (*Continued*)

Common Name	Taxon	Early Archaic		Middle Archaic		Middle/Late Archaic Mix		Late Archaic A		Late Archaic B		Late		Total	
		Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
Lizard, horned	*Phrynosoma* spp.	1	0.02	22	0.38	1	0.01	68	1.1	48	0.61	–	–	140	2.12
Lizard	Lacertilia	–	–	14	0.16	–	–	73	0.75	42	0.47	–	–	129	1.38
Snake, coachwhip/ whipsnake	*Masticophis* spp.	–	–	9	0.16	–	–	–	–	–	–	–	–	9	0.16
Snake, garter	*Thamnophis* spp.	–	–	–	–	–	–	1	0.07	–	–	–	–	1	0.07
Snake, king	*Lampropeltis* spp.	–	–	–	–	–	–	1	0.03	–	–	–	–	1	0.03
Snake, night	*Hypsiglena* spp.	–	–	–	–	–	–	3	0.25	–	–	–	–	3	0.25
Snake, nonvenomous	Colubridae	–	–	1	0.01	–	–	33	1.06	–	–	–	–	34	1.07
Snake, venomous	Viperidae	–	–	–	–	–	–	1	0.02	–	–	–	–	1	0.02
Snake	Serpentes	–	–	–	–	–	–	1	0.01	–	–	–	–	1	0.01
Reptile, indeterminate	Reptilia, indeterminate	–	–	–	–	–	–	4	0.02	3	0.01	–	–	7	0.03
Total		45	7.53	11,406	1790.54	52	8.23	3176	303.75	2507	176.75	20	2.78	17,206	2289.58

TABLE 59
Artiodactyl Index from Single-component Areas

	Middle Archaic	Late Archaic A	Late Archaic B
Total artiodactyl	269	64	25
Total lagomorph	498	209	253
Artiodactyl index	0.540	0.306	0.099

finished tools (table 61). This is in contrast to the CCS bifaces, which are more equally distributed across reduction stage and reflective of local lithic production.

The largest project sample of faunal remains, totaling 11,406 bones and bone fragments, was obtained from Middle Archaic components. The assemblage continues to exhibit a strong emphasis on the taking of large game (see table 58). The AI for identifiable artiodactyl and lagomorphs is 0.54; a similar relationship is apparent among the large- and medium-sized unidentifiable remains. By contrast, there is a marked drop-off in this index for Late Archaic components (see Late Archaic A).

In sum, while the hunting emphasis of the Early Archaic Period continues into the Middle Archaic periods, the latter marks the full-blown appearance of residential activity in the project area. Middle Archaic peoples are building houses, and gathering and processing local plant resources and small animal resources, but they are also engaged in long-range logistical forays in pursuit of large game. Based on the obsidian profile, much of the latter appears to have targeted upland areas to the north and northwest. The rise of logistical hunting, coupled with a more stable residential settlement pattern, has been documented in a variety of a Great Basin contexts (see Cultural Context) and will be further reviewed at the end of this section.

Late Archaic: Late Archaic deposits were identified at six sites: 26HU1830, 26HU1876, 26HU2871, 26HU3118, 26HU5479, and 26HU5621 (see table 10). These components mostly fall into two specific temporal intervals within this period: an earlier occupation recognized at 26HU1830, 26HU3118, and 26HU5621, and dated between about 1340 and 1165 cal b.p. (Late Archaic A), and a later occupation observed at 26HU1876 and 26HU5479 (primarily the former) and dating to about 985–865 cal b.p. (Late Archaic B). More generic Late Archaic deposits that cannot be further separated into smaller units of time were identified at 26HU2871.

Late Archaic A. All Late Archaic occupations are dominated by Rosegate-series projectile points. The Late Archaic A deposits have assemblages of milling and processing equipment comparable to that found during the Middle Archaic, including millingstones, handstones, battered cobbles, and miscellaneous ground stone (see table 57). What changes dramatically, however, is the Late Archaic A feature inventory which shows an absence of house structures, and an explosion of small, informal processing features composed of discrete concentrations of charcoal, fire-affected rock, and/or stained soil (table 63). The function of these features is uncertain, but they were probably used to process local plant or perhaps small animal resources. In this sense, Late Archaic A deposits speak to more short-term, resource-gathering and -processing activities, as opposed to habitation and other domestic uses.

Both Late Archaic components as a whole, and Late Archaic A deposits specifically, signal a major shift in toolstone production with CCS comprising up to 92% of all debitage dating to the Late Archaic A interval (see table 60). The intensity of CCS toolstone production is also reflected in the number of tools exhibiting signs of heat treatment. Over 30% of CCS tools from all Late Archaic contexts show evidence of thermal alteration (discoloration, crazing, pot-lidding, etc.), whereas only 16.5% of the Middle Archaic CCS tools were subjected to such treatment (table 64). There are eight documented

TABLE 60
Debitage Material Types by Single-component Areas

Type	Early Archaic		Middle Archaic		Middle/Late Archaic		Late Archaic A		Late Archaic B		Late Archaic		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Obsidian	2297	58.3	8405	34.4	1813	43.0	3754	6.2	86	0.5	952	11.6	17,307	14.4
Cryptocrystalline silicate	1544	39.2	15,562	63.6	2263	53.7	56,731	92.9	18,502	99.4	7183	87.2	101,785	84.5
Fine-grained volcanic	49	1.2	302	1.2	21	0.5	398	0.7	15	0.1	26	0.3	811	0.7
Indeterminate/ unknown	49	1.2	142	0.6	117	2.8	4	0.0	1	–	79	1.0	392	0.3
Quartzite	–	–	45	0.2	–	–	150	0.2	1	–	–	–	196	0.2
Total	3939		24,456		4214		61,037		18,605		8240		120,491	

TABLE 61
Obsidian Source Data from Single-component Areas

	Early Archaic		Middle Archaic		Middle/Late Archaic Mix		Late Archaic A		Late Archaic B		Late Archaic		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Mount Majuba	2	33.3	17	38.6	1	50.0	9	52.9	4	80.0	5	83.3	38	47.5
Massacre Lake/ Guano Valley	2	33.3	8	18.2	–	–	1	5.9	–	–	–	–	11	13.8
Buffalo Hills	–	–	4	9.1	1	50.0	2	11.8	–	–	1	16.7	8	10.0
Pinto Peak	–	–	5	11.4	–	–	–	–	–	–	–	–	5	6.3
Fox Mountain	1	16.7	2	4.5	–	–	–	–	1	20.0	–	–	4	5.0
Double H	–	–	–	–	–	–	3	17.6	–	–	–	–	3	3.8
Unknown A	–	–	2	4.5	–	–	1	5.9	–	–	–	–	3	3.8
Paradise Valley	1	16.7	1	2.3	–	–	–	–	–	–	–	–	2	2.5
Seven Troughs Range	–	–	1	2.3	–	–	1	5.9	–	–	–	–	2	2.5
Bordwell Spring	–	–	1	2.3	–	–	–	–	–	–	–	–	1	1.3
Craine Creek	–	–	1	2.3	–	–	–	–	–	–	–	–	1	1.3
Hawks Valley	–	–	1	2.3	–	–	–	–	–	–	–	–	1	1.3
Nut Mountain	–	–	1	2.3	–	–	–	–	–	–	–	–	1	1.3
Total	6		44		2		17		5		6		80	

TABLE 62
Bifaces by Material and Reduction Stage by Single-component Areas
CCS = cryptocrystalline silicate; FGV = fine-grained volcanic.

Material	Early Archaic		Middle Archaic		Middle/Late Archaic Mix		Late Archaic A		Late Archaic B		Late Archaic		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Obsidian														
Stage 2	–	–	5	5.3	–	–	–	–	–	–	–	–	5	3.3
Stage 3	–	–	6	6.3	2	18.2	3	13.0	–	–	1	12.5	12	7.9
Stage 4	3	37.5	22	23.2	2	18.2	1	4.3	–	–	1	12.5	29	19.2
Stage 5	5	62.5	50	52.6	2	18.2	15	65.2	2	33.3	4	50.0	78	51.7
Indeterminate stage	–	–	12	12.6	5	45.5	4	17.4	4	66.7	2	25.0	27	17.9
Subtotal	8	100.0	95	100.0	11	100.0	23	100.0	6	100.0	8	100.0	151	100.0
CCS														
Stage 1	1	16.7	–	–	–	–	3	1.1	2	2.2	–	–	6	1.2
Stage 2	1	16.7	9	13.0	3	50.0	30	10.5	6	6.6	7	21.9	56	11.5
Stage 3	3	50.0	18	26.1	–	–	58	20.4	17	18.7	7	21.9	103	21.1
Stage 4	–	–	18	26.1	–	–	96	33.7	34	37.4	10	31.3	158	32.3
Stage 5	–	–	18	26.1	1	16.7	66	23.2	15	16.5	6	18.8	106	21.7
Indeterminate stage	1	16.7	6	8.7	2	33.3	32	11.2	17	18.7	2	6.3	60	12.3
Subtotal	6	100.0	69	100.0	6	100.0	285	100.0	91	100.0	32	100.0	489	100.0
FGV														
Stage 4	–	–	3	60.0	–	–	–	–	–	–	–	–	3	60.0
Stage 5	–	–	2	40.0	–	–	–	–	–	–	–	–	2	40.0
Subtotal	–	–	5	100.0	–	–	–	–	–	–	–	–	5	100.0
Metasedimentary														
Stage 4	–	–	1	100.0	–	–	–	–	–	–	–	–	1	100.0
Subtotal	–	–	1	100.0	–	–	–	–	–	–	–	–	1	100.0
Total	14		170		17		308		97		40		646	

TABLE 63
Summary of Features from Single-component Areas
26HU2871 contains three features (6, 7, and 11) that date to two different time periods. Each counted once per time period. FAR = fire-affected rock.

Component	FAR Concentration	Hearth	Thermal	Total
Late	–	16	1	17
Late A	6	3	6	15
Late B	1	3	1	5
Middle	–	3	–	3
Middle/Late	–	–	1	1
Noncomponent	41	1	10	52
Total	48	26	19	93

chert source locations within a 10 km radius of the project area, and one quarry located within the project area (26HU5598), indicating that this toolstone class is of local origin. As in other components, the localized nature of CCS biface production is indicated in the broad representation of reduction stages, particularly early-stage percussion thinning (see table 62). By contrast, obsidian use collapses at this time in comparison to earlier-dating components, indicating a diminution in either the direct procurement of glass or intergroup exchange. Not surprisingly, the limited number of obsidian bifaces recovered are finished implements (Stage 5) that were probably transported to these sites in this condition.

Late Archaic A faunal assemblages produce an AI for identified artiodactyls and lagomorphs that is somewhat lower than that for the Middle Archaic (0.31), but is nearly threefold higher than the AI for Late Archaic B deposits (see table 58). These data suggest that large-game hunting remained relatively important at least through the early part of the Late Archaic, from about 1340 to 1165 cal B.P.

Late Archaic B. The other Late Archaic context that occupies a very narrow time frame was documented at 26HU1876, Grid 1, which dates to about 985–855 cal B.P. A very small amount of deposit dating to this time was also found at 26HU5479. This period is of interest because it appears to fall, at least partially, in a brief interdrought period of cool-wet conditions during the MCA that occurred between about 900 and 800 cal B.P. (Rhode, 2016). Notably, we see the return of habitation activities in the form of two house structures at 26HU1876, coupled with a reduction in the number of small processing features characteristic of other Late Archaic contexts. As with similar signs of habitation at 26HU1830 at the onset of the Late Holocene, it may be that ameliorating environmental conditions during this brief interval allowed for more sustained habitation of the Sulphur Springs area.

Overall assemblage characteristics of Late Archaic A and B components do not appear to be substantially different, each containing a standard assortment of flaked and ground stone tools (see table 57). Frequencies and densities of millingstones, however, reach their highest levels in Late Archaic B deposits, perhaps reflecting a shift from initial field processing of plant resources in small thermal features to final-stage food preparation associated with milling tools in domestic settings.

Most dramatic is the virtual disappearance of obsidian (0.5%) from contexts dating to this time, even more so when considering it comprises well over half of all debitage in Early Archaic components and over one-third in Middle Archaic contexts (see table 60). Toolstone production is entirely localized at this time, focused on nearby CCS sources, including 26HU5598 situated with the project area.

TABLE 64
Middle and Late Archaic Comparisons of CCS Artifacts Subjected to Heat Treatment
Includes all projectwide Middle and Late Archaic components.

	Total	Heat Treated	Percentage
Middle Archaic			
Projectile point	3	2	66.7
Biface	69	12	17.4
Drill	2	–	–
Formed flake tool	51	7	13.7
Flake tool	61	8	13.1
Core	8	3	37.5
Subtotal	194	32	16.5
Late Archaic			
Projectile point	24	6	25.0
Biface	408	143	35.0
Drill	2	–	–
Formed flake tool	43	9	20.9
Flake tool	152	22	14.5
Cobble tool	2	–	–
Core tool	3	2	66.7
Core	38	21	55.3
Tested cobble	2	–	–
Subtotal	674	203	30.1
Total	868	235	27.1

Also dramatic at this time is the near collapse of large-game hunting. While there is some evidence that the Middle Archaic focus on large-game hunting extends into the initial part of the Late Archaic Period, by about 985–855 cal B.P. this pattern is gone. The AI calculation for Late Archaic A stands at 0.31, while it drops to only 0.10 in Late Archaic B contexts (see table 58). Subsistence at this time is geared almost exclusively toward local small game (mostly rabbits) and plant resources.

MIDDLE VERSUS LATE ARCHAIC DOMESTIC/HABITATION PATTERNS: Aside from more general assemblage comparisons between the various temporal components identified in the project area, the project findings allow for more fine-grained comparisons between specific habitation loci. We refer here to the house structures, associated features, and living areas observed at both 26HU1830 (Grid 2 Area) and 26HU1876 (Grid 1 Area). Both offer snapshots of domestic/habitation activities dating to very narrow time frames, the former dating to a roughly 100 year period ca. 3000 cal B.P., and the latter to a 130 year period between 855 and 985 cal B.P.

In table 65, absolute quantities of the major tool types are converted to relative densities for each of the habitation loci. For major categories of hunting-related tools (i.e., projectile points, bifaces, formed flake tools, and flake tools), densities are uniformly higher in Middle Archaic contexts. This hunting focus is supported by the density of faunal remains from each context, with Middle Archaic deposits producing densities five times greater than in Late Archaic B deposits. The profile of animal bone is weighted

TABLE 65
Assemblage Summaries from the Middle and Late Archaic B House Structures

Component	Middle Archaic		Late Archaic B	
Site	26HU1830 Grid 2		26HU1876 Grid 1	
Volume (m^3)	58.74		63.19	
	Count	Count/m^3	Count	Count/m^3
Flaked stone tools				
Projectile point	41	0.70	18	0.28
Biface	119	2.03	97	1.54
Drill	2	0.03	1	0.02
Formed flake tool	56	0.95	8	0.13
Flake tool	76	1.29	56	0.89
Cobble tool	2	0.03	3	0.05
Core tool	1	0.02	–	0.00
Core	5	0.09	7	0.11
Subtotal	302	5.14	190	3.01
Debitage				
Debitage	16,178	275.42	18,600	294.35
Subtotal	16,178	275.42	18,600	294.35
Ground stone				
Millingstone	8	0.14	19	0.30
Handstone	3	0.05	–	–
Mortar	1	0.02	–	–
Anvil	5	0.09	–	–
Battered cobble	7	0.12	–	–
Misc. ground stone	12	0.20	6	0.09
Subtotal	36	0.61	25	0.40
Miscellaneous prehistorics				
Bead, shell	9	0.15	–	–
Bead, bone	3	0.05	2	0.03
Awl	1	0.02	3	0.05
Modified bone	19	0.32	1	0.02
Modified stone	–	–	1	0.02
Subtotal	32	0.54	7	0.11
Faunal remains				
Bone	11,099	188.95	2464	38.99
Total	27,647	471	21,286	337

more toward large mammals in the Middle Archaic assemblage while, conversely, small mammal remains dominate the Late Archaic habitation deposits. As discussed elsewhere, the obsidian profiles from Middle Archaic contexts indicate a higher transport distance, perhaps signaling that hunting activities based out of 26HU1830 were directed at comparatively longer range logistical forays to areas mostly north of the project area.

Flaked stone production intensity as measured by debitage densities is marginally higher in Late Archaic contexts. This may have more to do with the transition from obsidian, which was transported to the area in finished or near-finished form, to local CCS production. As such, these values are probably not a good proxy for hunting intensity.

Given the focus on hunting in the Middle Archaic habitation area, it is worth noting that this does not appear to have come at the expense of plant gathering and processing. Densities of milling equipment (millingstones, handstones, and miscellaneous ground stone) are equivalent between the two habitation areas. Several classes of processing tools, such as battered cobbles and anvils, are more decidedly represented in Middle Archaic habitation contexts, although the relationship of these tools with plant processing is less certain.

The nonutilitarian artifacts like shell and bone beads (including modified bone which appear to be fragments of bone beads), as well as awls, which were associated with domestic activities such as hide working and basketry manufacture, show nearly five times greater density in the Middle Archaic habitation. To the extent that these artifacts are broad measures of domestic habitation, this activity appears to have been more sustained in the Middle Archaic than was the case in the Late Archaic B habitation area.

With respect to the three house structures documented during the project, there are clear differences in construction between the 3000 year old house at 26HU1830 (Feature 9-1) and the two roughly 900 year old houses at 26HU1876 (Features 30 and 31). Simply stated, the Middle Archaic house is both larger and more formalized than the others. It measures 3.0 m in diameter as opposed to the 2.5 meter diameter of its Late Archaic counterparts. Although not a true pit house, it appears to have been excavated into the underlying substrate, as its perimeter edge is more perpendicular to the floor than the Late Archaic structures. It contains a more formalized central hearth, as well as a series of 16 posthole subfeatures that ring its perimeter. The latter are missing from the Late Archaic structures, suggesting that the Middle Archaic house is a more robust superstructure that might be expected for longer, multiseasonal periods of habitation.

As to construction techniques, these findings comport well with the results of other studies of Middle and Late Archaic houses in the northwestern Great Basin. McGuire (2002) surveys the roster of reported house structures from this region using a tripartite temporal scheme: Middle/Late Archaic Pattern (2000–1000 B.P.); Late Pre-Numic Pattern (1000 to 500–300 B.P.) and Numic Pattern (500–300 B.P. to Protohistoric). He characterizes houses dating to the oldest period as tending to be larger with more formalized construction techniques and greater floor complexity, manifested by central hearths, caches, storage pits, perimeter rock, excavated sidewalls, and elaborate superstructures.

Not all of these attributes, however, are exclusively diagnostic. More recent excavations of Middle Archaic houses in the Honey Lake area (Young and Hildebrandt, 2017) document robust floor assemblages but with more limited construction elaboration (e.g., no hard-packed floors, postholes, perimeter stones). Many of these features are situated in a sandy matrix, which may have acted to obscure original construction techniques (see also Epstein, 2017, for a discussion of the variation in domestic structures documented in southern Oregon).

Notwithstanding this variation in construction, the data at hand speak to a generally greater degree of formality in structure construction earlier in time. The 3000 year old house at 26HU1830, with its larger diameter, excavated subfloor, central hearth, and evidence of a robust superstructure (post-holes), fits well with McGuire's Middle/Late Archaic pattern.

Synthesis

With respect to some of the research issues identified in the Prehistoric Context, this study provides commentary on three broad topics: (1) the role of environmental change in trans-Holocene settlement structure; (2) the rise of Middle Archaic residential stability and logistical hunting; (3) obsidian conveyance patterns; and (4) subsistence-settlement variation within the Late Archaic Period. To this we can add an additional topic defined more by a near absence of evidence of it within the project area: the missing Terminal Prehistoric record.

The Role of Environmental Change in Trans-Holocene Settlement Structure: It is perhaps not surprising in this barren landscape on the south edge of the Black Rock playa, sustained primarily by only several isolated springs of uncertain production, that changes in climate and environmental productivity could have profound effects on settlement structure. Still, it is remarkable how the overall settlement profile within the project area responded to these changes.

Although no intact components were identified, we see a fairly robust assemblage of Great Basin Stemmed series points followed by a near collapse of Northern Side-notched points (see fig. 50). The former is generally considered coterminous with the Early Holocene (12,800–7800 cal B.P.), which in this region is identified as a period of highly variable but generally cooler and moister conditions than what we see today (Rhode, 2016). Northern Side-notched points fall into the Middle Holocene, dating to about 7800–5700 cal B.P. The early part of the Middle Holocene (8500–6300 cal B.P.) represents one of the warmest and driest Holocene climatic regimes (Mehringer, 1986; Wigand and Rhode, 2002: 325; Louderback et al., 2011). By this time, most lakes and marshes had desiccated; the lower reaches of the Humboldt River may have ceased to flow and regional water tables had dropped; and greasewood and saltbush communities had colonized playa margins and lower valley floors (Hansen, 1947; Mehringer, 1985; Rhode, 2016). Along with these regional consequences, it is not hard to imagine that spring discharge within the study area was severely compromised as well. In such a scenario, the Sulphur Springs area may have been essentially uninhabitable.

The next pulse of occupation in the study area probably commences at about 4500 cal B.P., continuing to around 3000 B.P. This is reflected in a substantial uptick in the number of Gatecliff-, Humboldt-, and Elko-series projectile points (see fig. 50), but more specifically by the radiocarbon profile (see fig. 51) and documentation of substantial habitation deposits at 26HU1830, Grid 2. This pattern has been identified elsewhere in northern Nevada, including Paiute Creek Shelter located 40 km to the northwest (Smith et al., 2012) and along the Ruby Pipeline, with the latter showing marked increases in the number of components and habitation sites dating to the Early and Middle Archaic (Hildebrandt et al., 2016; McGuire et al., 2016). As reviewed by Rhode (2016), numerous records point to a significantly cooler and moister period after about 5000 to 4500 cal B.P., variously referred to as the Medithermal (Antevs, 1948), Neoglacial (Porter and Denton, 1967), and Neopluvial (Currey and James, 1982) periods. Effects include a broad expansion of woodlands and sagebrush communities (and decrease in saltbush), as well as increases in flows on the Humboldt River, among many other changes.

Noteworthy, however, is that evidence for occupation of the study area essentially goes dark between 2800 and 1500 cal B.P. No dated components were identified to this time and only one radiocarbon date falls within this period (see fig. 51). This correlates with a period of sustained drought that occurred between 2600 and 1700 cal B.P. (Mensing et al., 2004). Mensing equates this drought period as on par with the intensity of that observed during the Middle Holocene, and Thomas (2014: 143) suggests that much of the central Great Basin may have actually been abandoned at this time. Judging from the record of occupation associated with the current project area, the local effects of this drought were significant to prevent meaningful habitation.

Finally, the cause and effect of environment and settlement activity is seen again with the florescence of Late Archaic occupation. With the eventual reemergence of more mesic conditions after the aforementioned Late Holocene drought between 2600 and 1700 cal B.P., we see a large increase in settlement activity exemplified by the deposits dated from about 1340–1165 cal B.P. at 26HU1830, 26HU3118, and 26HU5621.

The radiocarbon profile for the Late Archaic Period as a whole, however, is bimodal with a sudden break at about 1000 B.P., a spike at roughly 985 to 855 cal B.P., followed by another break. As we have noted elsewhere, the initial break corresponds to the onset of drought conditions of the MCA. The MCA, however, typically exhibits two major episodes, the first from approximately 1100–900 cal B.P. and the other between 800 and 650 cal B.P. The two drought periods are separated by a brief and intense moist period dating to between roughly 900 and 800 cal B.P. It is this brief moist period that is of interest here, as it is at about this time that we see the brief return of habitation in the study area; this is evidenced by house structures at 26HU1876, Grid 1, which date to about 985–855 cal B.P.

This relationship may be coincidental in some sense, but it does seem worth noting that both the radiocarbon and settlement profile seem to track the drought-wet-drought cycle of the MCA. While some researchers have pointed to a significant time lag between a particular climatic signal and a corresponding environmental or cultural response based on radiocarbon metadata (see Kelly et al., 2013), the more immediate response in the study area may again relate to local ground water conditions and discharge at Sulpher Springs.

The Rise of Middle Archaic Residential Stability and Logistical Hunting: While the patterns observed in the archaeological record of the project area speak to a broad correspondence between environment and the intensity of occupation, there are other patterns that appear less, or only indirectly related. We refer here to shifts in settlement and subsistence, and the debate surrounding Middle Archaic land use. With regard to settlement, one perspective holds that populations were much more residentially mobile at this time, moving up and down valley systems on a seasonal basis, traversing enormous distances (Basgall and Delacorte, 2012; see also Basgall and McGuire, 1988; Delacorte and McGuire, 1993; Bettinger, 1999). By contrast, the other perspective sees this time as the trans-Holocene high point of residential stability in nonagricultural areas of the Great Basin (Hildebrandt and McGuire, 2002; McGuire and Hildebrandt, 2005).

The results from the excavations at 26HU1830, Grid 2, and the study area as a whole, are more parsimonious with the latter perspective. At 26HU1830, we see the first evidence in the study area for a substantial habitation replete with a house structure, and associated feature complex and living area. The house is robust, compared to later-dating structures documented in the project area; it is larger with more formal floor excavation, contains a central hearth, and exhibits a perimeter array of large-diameter post-holes. Tool forms include a variety of flaked and ground stone specimens in comparatively high densities, suggestive of longer-term habitation by an extended family group that included both men and women.

It is important to realize that this Middle Archaic settlement pose is observed in a variety of contexts throughout the Great Basin. In northwestern Nevada, true settlement hierarchies with the increased use of large semisedentary base camps appear at this time (Hildebrandt et al., 2016; see also McGuire et al., 2016). Elsewhere, large, semisedentary residential complexes have been documented along the Humboldt Lake bed (Livingston, 1986), Carson Sink (Raven and Elston, 1988; Raymond and Parks, 1990; Kelly, 2001; Madsen, 2002), and the Humboldt River near Battle Mountain (King and McGuire, 2011). These findings are consistent with various excavations in the northwestern Great Basin, including the Honey Lake region and the Reno area, where large accumulations of Middle Archaic middens and artifacts have been identified at a series of ecological "sweet spots" (Elston et al., 1994; see also Riddell, 1960; McGuire, 1997). Many of these sites contain a proliferation of house structures, hearths, ovens, and burials, as well as some of the richest and most diverse assemblages of artifacts and subsistence remains identified in the region. Along the southwestern shore of Honey Lake, the recently identified Tufa Village Site (26Wa2640) contains the remnants of six house structures radiocarbon dated to between 2780 and 3830 cal B.P. (Young and Hildebrandt, 2017). Similar settlement elaborations have also been observed in Surprise Valley (O'Connell, 1971, 1975) and Massacre Lake (Leach, 1988: 183), with the latter showing the rise of residential sites with midden for the first time.

An additional aspect of this residential stability is that it appears to have been accompanied by an increased emphasis on hunting, especially large game procured by logistically organized hunters emanating from these basecamps (Hildebrandt et al., 2016; McGuire et al., 2016; see also Thomas et al., 1986; Hildebrandt and McGuire, 2002; Broughton and Bayham, 2003; McGuire and Hildebrandt, 2005; Hildebrandt and McGuire, 2016; Young and Hildebrandt, 2017). Recent metadata analyses conducted across the northern Great Basin are consistent with these earlier findings, showing an increase in the taking of large animals (e.g., artiodactyls) commencing in the Early Archaic and extending into the Middle Archaic Period (McGuire et al., 2016).

The results from this study are important to this issue because they involve multiple archaeological components representing critical time frames, many with relatively large faunal samples, and these samples come from a desert setting that was probably never an optimal habitat for large game. Despite the desert setting, the sample of identifiable artiodactyls and lagomorphs for the Middle Archaic produced an AI of 0.54, and a similar finding is apparent among the large- and medium-sized unidentifiable remains as well. By contrast, there is a marked drop-off in this index for Late Archaic A (0.31) and Late Archaic B (0.10) components (see tables 58, 59).

While changing environmental conditions may have contributed to this pattern, there is strong evidence that a shift in land-use strategy also played a major role. We can track this settlement shift through obsidian/CCS ratios. Insofar as obsidian reflects exotic and CCS local toolstone use, the ratio provides a rough index of the degree of extralocal procurement. To the extent that obsidian procurement was the result of long-range logistical forays, conducted by males and often coupled with the pursuit of large game, the ratio could provide a proxy measure of this kind of logistical hunting activity.

Figure 52 plots the AI against the Obsidian/CCS ratio starting at about 4500 cal B.P. and ending around 850 cal B.P. As can be seen, the two indices track in tandem with each other suggesting that long range obsidian procurement and artiodactyl hunting are related, and both decline over time. As will be discussed in more detail below (see fig. 53), most of the obsidian dating to the earlier components was obtained from upland areas to the north, places more conducive to supporting artiodactyl populations than the Black Rock Desert, providing additional support for logistical hunting activity. While these findings do not rule out the role of environmental change, they do indicate that changing faunal assemblage profiles can result from other factors, including shifting settlement configuration.

Obsidian Conveyance Patterns: Geochemical sourcing of obsidian artifacts provides a way to reconstruct the paths taken between the sources of the raw material and the sites in which they were found. Changes over time in these conveyance patterns can reflect shifts in settlement ranges, lithic technologies, trade relationships, or some combinations of these. Distinguishing among these variables, however,

TABLE 66
Obsidian Source Profiles, Average Transport Distances, and Source Diversity

	Samples with Known Sources	Average Transport Distance (km)	Shannon Source Diversity Index	% Obsidian
Component Areas				
Early Archaic	6	58.5	1.3	58.3
Middle Archaic	42	47.5	1.9	34.4
Late Archaic A	16	33.8	1.2	6.2
Late Archaic B	5	18.0	0.5	0.5
Projectile Points				
Gatecliff (Early Archaic)	15	59.5	1.6	93.8
Humboldt (Early Archaic)	18	45.3	1.8	82.6
Elko (Middle Archaic)	53	39.6	2.0	91.8
Rosegate (Late Archaic)	28	32.1	1.2	58.0

can be difficult and subject to toolstone sample quality (Smith and Harvey, 2017).

One way of quantifying these trends is by calculating the diversity of sources represented, and the average transport distances between source and site (e.g., Smith, 2010). For example, on the route of the Ruby Pipeline north of the project area, King (2016) documented striking patterns in obsidian conveyance. Overall source diversity and average transport distance were high in the earliest periods of prehistory, falling to their lowest levels during the Middle Archaic period. These changes likely reflected a contraction of an initially wide-ranging settlement pattern, and a shift toward a systematized pattern of toolstone procurement focusing on a smaller number of favored sources. In the Late Archaic, source diversity and transport distances remained generally low while the overall proportion of obsidian in assemblages declined. Finally, in the Terminal Prehistoric period, source diversity and transport distances increased sharply, even as the proportion of obsidian in lithic assemblages continued to decline. Similar trends in source diversity were noted by McGuire (2002) at sites along the Tuscarora pipeline and Alturas transmission-line projects in northeastern California.

How does the project data compare to these patterns? Unfortunately, the sample of sourced artifacts assigned to components is small, due to the decision to focus geochemical sourcing efforts on projectile points (see Laboratory and Analytical Methods). Table 61 shows the source profile of artifacts within component areas. Most periods except the Middle Archaic are poorly represented. Despite the small sample sizes, there is a readily apparent trend through time toward the use of the closest sources (Mount Majuba and Seven Troughs Range), in tandem with an increasing use of local nonobsidian materials. Table 66 summarizes the trends in average transport distance and source diversity. (For the sake of simplicity, the table omits the Middle/Late Archaic Mixed and undifferentiated Late Archaic components; it should also be cautioned that the transport distances are approximate, especially with regard to the "local" sources, since the distribution of these sources is not well known.) Transport distances fall steadily throughout the temporal sequence, as the use of local sources increases. Source diversity also generally falls through time, although the Middle Archaic sample has higher diversity than the Early Archaic sample, in contrast to the trends observed in the Ruby Pipeline and Tuscarora/Alturas datasets. It is unclear whether this reflects a real difference, or simply the very small sample size from the Early

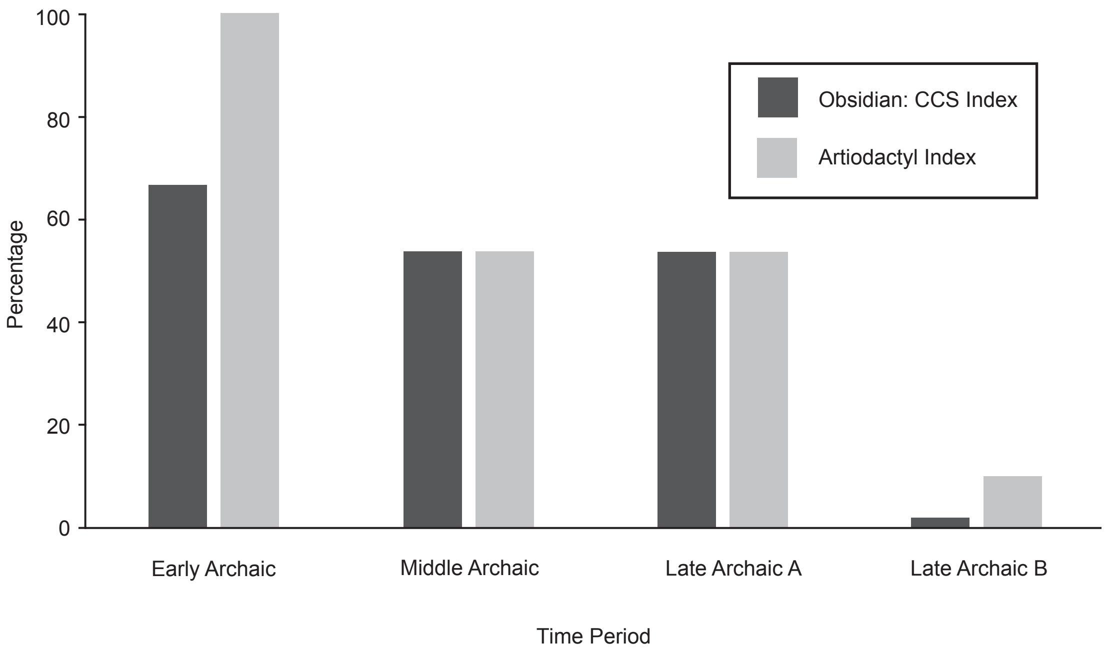


FIGURE 52. Obsidian/CCS index versus artiodactyl index by single-component areas.

Archaic. The Late Archaic B sample is also very small, but suggests a sharp drop from the previous Late Archaic A sample in both source diversity and average transport distance.

Figure 53 shows the distribution of known sources in the samples, as well as diagrams showing the shortest paths to the sources represented in each period. Again, sample sizes caution against overinterpretation, but there seems to be a pronounced Middle Archaic focus on sources to the north and west (Buffalo Hills, Massacre Lake, Fox Mountain) that is significantly reduced in other periods. This could reflect a change in overall settlement range, or a technology-driven preference for these sources that prompted their direct procurement by Middle Archaic occupants of the project area, or some combination of these factors.

Because projectile points are temporally diagnostic, we can also consider them independently of component areas, as a different way of quantifying the observed trends, and overcoming the sample-size limitations to some extent. Table 66 shows transport distances and diversity statistics for the point types corresponding to the time periods for which we have components. Overall sample sizes are higher for projectile points than their corresponding component assemblages, but Rosegate points lack the distinction between the subperiods of the Late Archaic afforded by the component assemblages. In general, source diversity and transport distances show the same trends in both datasets, particularly the Late Archaic drop in diversity and transport distance. However, the higher percentages of obsidian among projectile points than the more generalized component assemblages is noteworthy. Like earlier types, Rosegate points continue to be made predominantly of obsidian, even as the proportion of obsidian in Late Archaic component assemblages drops precipitously. It is unclear whether this reflects trade in finished items from outlying areas with easier access to obsidian, or a general preference for higher-quality material in projectile points as opposed to other flaked stone tools. The same disjunction in material profiles between finished tools and debitage is a common feature of flaked stone assemblages throughout the region, however.

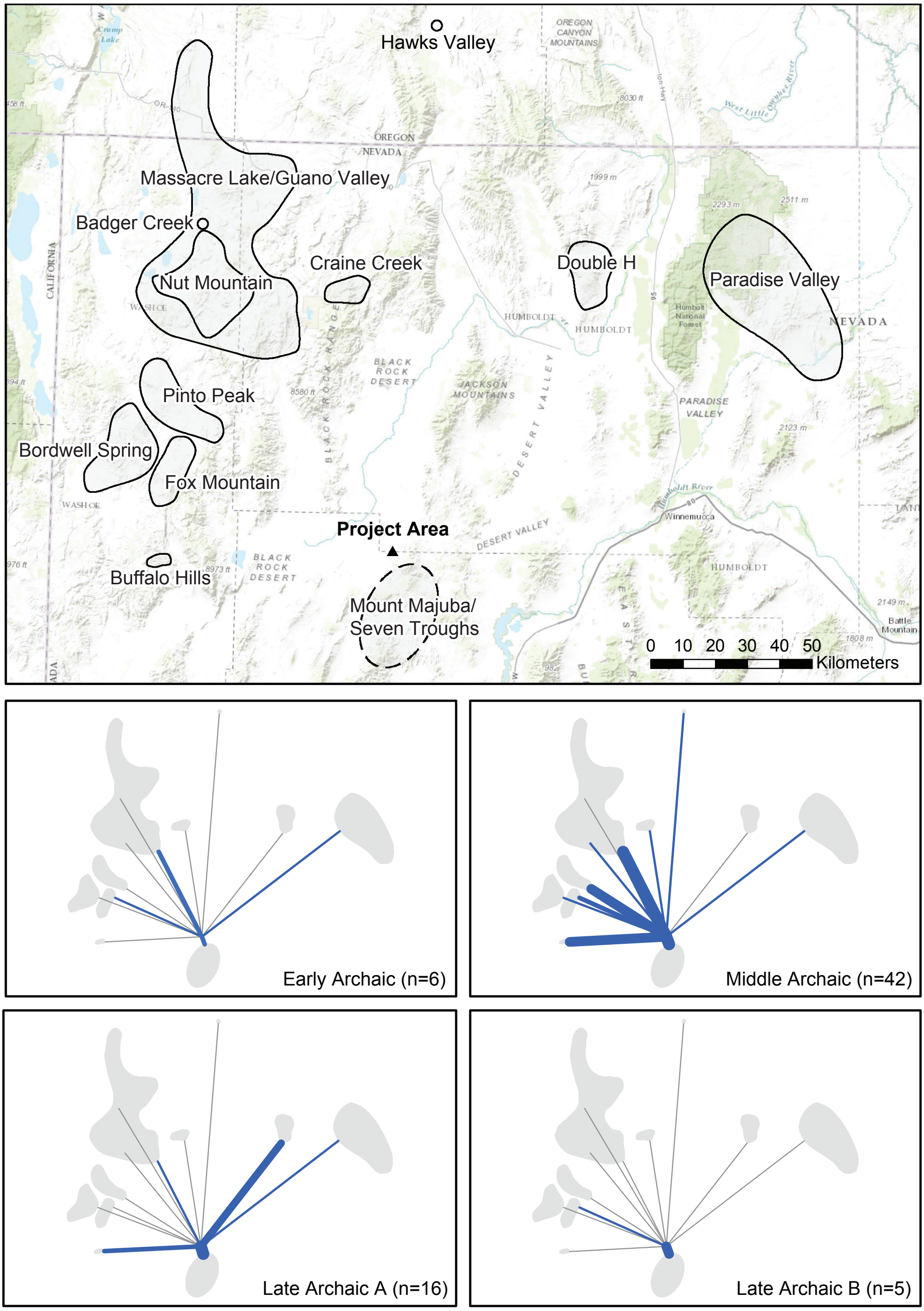


FIGURE 53. Nearby obsidian sources and travel paths to study area sites

The lack of a Terminal Prehistoric record at the project sites precludes comparison with the most interesting part of the obsidian conveyance patterns observed in the Ruby Pipeline data, namely the sharp increase in transport distances during that period. It is noteworthy, however, that the Late Archaic assemblages in the project area show no trace of this increase, suggesting that if this pattern is to be found in the Black Rock Desert region, it will be a truly Terminal Prehistoric phenomenon, likely associated with the relatively late arrival of Numic people in the region.

Subsistence-Settlement Variation within the Late Archaic Period: As we reviewed in the Cultural Context, most researchers would now agree that the period between 1300 and 600 cal B.P. was a time of profound cultural change along the northern Great Basin, possibly induced by severe drought (e.g., MCA, ca. 1100 to 650 cal B.P.), population increases, resource intensification, ethnic displacements, changes in technology, social conflict, or some combination of these. Some of these changes are thought to have occurred in the latter half of this period after approximately 1000 cal B.P., thus potentially splitting the Late Archaic into an earlier phase, where conditions may have been more like the preceding Middle Archaic Period, and a later phase marked by environmental and social disruptions.

Intraperiod variability in the archaeological record of the Late Archaic is therefore of continuing research interest. We are fortunate to have two major Late Archaic component periods: an earlier occupation dated to about 1340–1165 cal B.P. (Late Archaic A), and a later occupation dating to about 985–855 cal B.P. (Late Archaic B). As we have indicated, the later-dating component does not postdate the MCA but is separated enough in time to provide an assessment of intraperiod variability.

As we have previously reviewed, the most obvious changes are in the toolstone material profiles and the artiodactyl indices associated with these two periods, with obsidian use virtually disappearing and large-game procurement diminishing in importance. The toolstone profile bears similarity to the Ruby Pipeline findings, which show that locally available CCS was used more than obsidian for the first time in prehistory during the Late Archaic Period (Hildebrandt et al., 2016). Similarly, there is a trend within the project area for increasing thermal alteration (heat treatment) of CCS through time, perhaps also reflecting an intensification of lithic production directed at this particular class of toolstone (see table 64). These trends have usually been interpreted in other Great Basin contexts as reflecting some combination of local resource intensification, settlement contraction, and overall territorial circumscription (Basgall and McGuire, 1988; Elston and Budy, 1990; Gilreath and Hildebrandt, 1997; Bettinger, 1999; Smith, 2010). The shift to local small-game resources also fits well with this notion of continuing population increase and resource intensification. The profusion of small processing features, most likely used to process plant and small-game resources, may also be tied to resource intensification, although the intraperiod variation in this activity is less clear. In sum, while many of these changes are not unexpected and fit broader regional trends, data from the study area provide much better temporal resolution and suggest that they happened rapidly over only a 300 or 400 year period.

The Missing Terminal Prehistoric Record: While we have built a strong case for coassociations between the environmental and cultural records within the study area, this relationship appears to break down during the Terminal Prehistoric period. In comparison to the MCA, Rhode (2016) points to this time as cooler and moister (with a limited number of short warm-dry intervals), perhaps rivaling conditions that last prevailed during the Early Holocene (Thompson, 1992). Despite these ameliorating conditions, there is no component record dating to this time within the study area, and only a smattering of Desert-series projectile points. These data suggest that we must look at other and/or additional causes for this break in the settlement record.

This pattern of settlement reorganization during the Terminal Prehistoric Period has been observed in a number of other contexts, most notably along the Ruby Pipeline corridor (Hildebrandt et al., 2016; McGuire et al., 2016). It is at this time that the number of single-component manifestations—often used as a proxy for population density—decreases for the first time during the Holocene. Based on a large-scale survey of floodplains and meander belts in wetlands associated with the Humboldt River near Battle Mountain, there is severely underrepresented evidence of Terminal Prehistoric occupation in comparison to earlier periods (McGuire and King, 2011). This study is significant in that it suggests that this drop in settlement activity also occurred in productive habitats adjacent to a permanent stream. Lastly, many Late Holocene multihouse basecamps in this region also show significant decreases in residential use at this time (Riddell, 1960; O'Connell and Inoway, 1994; McGuire, 2002a; Young and Hildebrandt, 2017).

It is, of course, at this time that Numic-speaking peoples are thought to have entered the area from a homeland near the desert margins of the southern Sierra Nevada (Lamb, 1958; Bettinger and Baumhoff, 1982; Madsen and Rhode, 1994; Kaestle and Smith, 2001). Bettinger and Baumhoff (1982) originally argued that pre-Numic (i.e., Middle/Late Archaic) people were residentially mobile "travelers" who lived in relatively small groups, moving from one high-ranked resource patch to another on a regular basis. Because of their low densities and high level of mobility, they could be outcompeted by Numic peoples (characterized as "processors"), who were less mobile and had higher population densities, the latter made possible by their more intensive use of lower-ranked (but abundant) resources.

But, as outlined above, the high degree of residential stability and population density represented by the Middle/Late Archaic record (and the Lovelock Culture) hardly reflects a "traveler" adaptation. Instead, it seems more likely that the adverse effects of the MCA led to the demise of the Middle/Late Archaic culture, and that Numic peoples did not "outcompete" existing groups but essentially recolonized a severely compromised cultural landscape after the MCA. They brought a dispersed family-band settlement structure with substantially less residential aggregation and, perhaps, even lower population densities. With their small, dispersed, family-band organization, the Numa occupied habitats and zones previously ignored or underutilized by previous populations and, conversely, often bypassed the conventional residential aggregation sites that had attracted groups for several preceding millennia.

ACKNOWLEDGMENTS

This volume was made possible with the support of Randy Buffington and the Hycroft Mining Corporation, with oversight and encouragement provided by Kathy Ataman and Mark Hall of the Winnemucca District, Bureau of Land Management. We are also grateful to Ed Stoner and the field and laboratory staffs of Western Cultural Resources Management, Inc., as well as all the crew members who participated in the excavations effort. Tom Bullard of the Desert Research Institute was instrumental with regard to many of the geomorphological assessments and interpretations contained in this volume. The collection is permanently housed at the Nevada State Museum in Carson City; we thank Rachel Kaleilehua Delovio, Anthropology Collections Manager, for facilitating this effort.

On the Far Western side, we thank our Carson City staff, including Tucker Orvald, Albert Garner, and Jerry Tarner, for their records and collections controls, as well as project administration. The laboratory and report production programs were conducted in our Davis office, the former facilitated by the efforts of Jay King, Lucas Johnson, Jill Eubanks, and Patty Galindo, the latter by Nicole Birney, Kathleen Montgomery, Michael Pardee, and Sharon Waechter. GIS and other mapping assistance were provided by Paul Brandy, Shannon DeArmond, Jill Bradeen, and Melissa Murphy.

This volume was made better by the review comments provided by Geoffrey Smith and others, as well by the many informal discussions with our friends and colleagues here at Far Western. Finally, we are indebted to David Thomas, Peter Whiteley, Diana Rosenthal, and Mary Knight of the American Museum of Natural History for their efforts in making this volume part of the *Anthropological Papers*.

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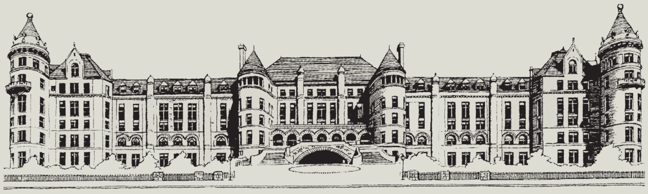

Unique among Great Basin archaeological studies, this volume presents the results of a massive excavation program directed at five open-air sites. These sites are clustered adjacent to several springs of uncertain reliability, bound to the north by the lifeless expanse of the Black Rock playa, and to the south by dune fields, alluvial fans, and barren hills marginal by even Great Basin standards.

Within this forbidding landscape, Native peoples somehow eked out a living at various times during the Holocene, tied to the vicissitudes of climate change. Full-blown residential activity springs to life during wet periods, only to be eclipsed by the next drought cycle. This dynamic archaeological record provides not only insight into the adaptive responses associated with environmental instability, but also commentary on a host of other research themes, including the rise of residential stability and logistical hunting, toolstone use and conveyance, shifts in domestic and habitation patterns, resource intensification, as well as a surprising reorganization of settlement strategy during the final period of prehistoric occupation.

Kelly R. McGuire, William R. Hildebrandt, D. Craig Young, Kaely Colligan, and Laura Harold are archaeologists at Far Western Anthropological Research Group, Inc., headquartered in Davis, California. This group has conducted archaeological research in California and the Great Basin for multiple decades, publishing information generated by cultural resources management studies in academic journals, monographs, and books, as well as producing films, school curricula, and other educational materials for the public.

On the cover: Satellite and ground photography of the Black Rock Desert and study area. Map by Paul Brandy, design by Nicole Birney.

ISBN 978-0-9852016-8-5
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