Archaeological Investigations at CA-KER-229, Tomo-Kahni State Historic Park, Sand Canyon, California

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Abstract

The CA-KER-229 site is an extensive lithic scatter with a small habitation locus dating primarily to the Late Prehistoric Period and early historic times. Three episodes of fieldwork have been undertaken at the site, one in the mid-1950s by the Archaeological Survey Association of Southern California, one between 1970 and 1971 by Antelope Valley College, and one by California State University, Bakersfield, in 2005. This work variously involved mapping, surface collections, and test excavations. This paper reports on the analyses of the extant collections from the site.

Introduction

The CA-KER-229 site is located within Tomo-Kahni State Historic Park and lies along the western edge of Sand Canyon, about 12 miles northeast of Tehachapi in Kern County, California (Figure 1). The site lies approximately 400 m to the north of Nettle Spring, the center of a large complex of sites that includes KER-229. The first two investigations of the Nettle Spring area were conducted by the Archaeological Survey Association of Southern California (ASA) in 1954 and in 1956 and by Antelope Valley College (AVC) between 1970 and 1971. The Nettle Spring site complex includes a large habitation site (CA-KER-230) that contains numerous circular rock ring features and over 400 bedrock mortars, a number of small camps (Ptomey 1991; Hinshaw and Rubin 1996), rock art localities (e.g., Sutton 1981, 2001; Lee 1999; Fleagle and Sutton 2007), and a cremation locality (Siefkin and Sutton 1995). In addition, archaeologists from California State Parks conducted extensive surveys of the area, recording sites and updating site records (Dallas 2000). The majority of the materials from these various sites appear to date to the Late Prehistoric and/or ethnohistoric periods, although there are some projectile point types (e.g., Gypsum) in the collections that suggest an earlier occupation.

The KER-229 site was first recorded in 1951, and the site record has been updated a number of times. In 1956, ASA worked at the site, and AVC conducted some excavations in 1971. In the early 1990s, ASA transferred some materials from its work at the Nettle Spring site complex to California State University, Bakersfield (CSUB), but this included only a few artifacts. At about that same time, AVC transferred its KER-229 collection to CSUB. In 2005, additional surface observations were made at the site by one of us (BW). In 2007-2008, a general assessment of the overall Nettle Spring collection (including KER-229) was conducted by researchers from Cal Poly Pomona, who incorporated mapping information into a GIS database (Allen and Burns 2008). This paper considers

all investigations at KER-229 and serves as the final report on the ASA and AVC work at the site.

Setting

The KER-229 site lies in the foothills of the southern Sierra Nevada. The site is situated on a north-facing slope along the drainage from Nettle Spring at an elevation of about 1,330 masl (4,400 ft). The terrain is rocky but relatively flat. The local geology consists of sedimentary formations of limestone and sandstone with volcanic intrusions.

The site lies within a juniper woodland community. This community is characterized by the presence of California juniper (*Juniperus californica*), single-leaf pinyon (*Pinus monophylla*), rabbit brush (*Chrysothamnus* spp.), big sagebrush (*Artemisia tridentata*), annual and perennial grasses, buckwheat (*Eriogonum* spp.), and a number of wildflowers.

Common fauna of the general area include mule deer (*Odocoileus hemionus*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), occasional mountain lions (*F. concolor*), gray foxes (*Urocyon cinereoargenteus*), skunks

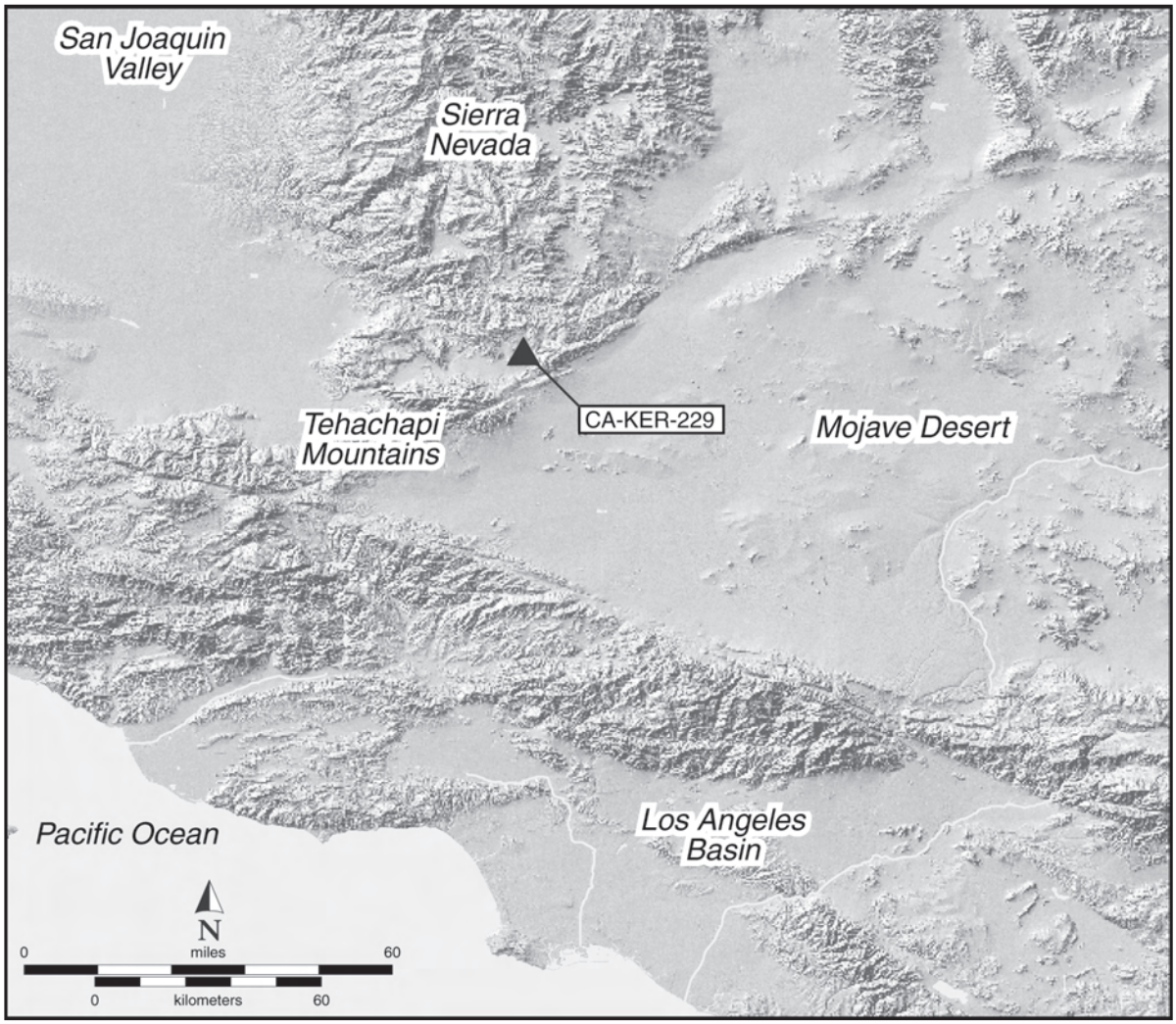

Figure 1. Location of CA-KER-229 in the southern Sierra Nevada.

(*Spilogale putorius* and *Mephitis mephitis*), California ground squirrels (*Citellus beecheyi*), packrats (*Neotoma* spp.), mice (*Peromyscus* spp. and *Perognathus californicus*), California quail (*Callipepla californica*), common ravens (*Corvus corax*), and a variety of small birds and insects.

The site lies within the territory claimed by the Kawaiisu (Zigmond 1986:Figure 1), who were bordered by the Tübatulabal to the north, the Yokuts to the west, the Kitanemuk to the south, and the Panamint to the east. The Kawaiisu were hunters and gatherers. Primary plant foods included acorns (*Quercus* spp.), pine nuts (*Pinus* spp.), and various grass seeds, but many other plant foods were also consumed (Zigmond 1978, 1981, 1986). The Kawaiisu hunted a variety of animals including bighorn sheep (*Ovis canadensis*), mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), black-tailed hares (*Lepus californicus*), and desert cottontail (*Sylvilagus audubonii*).

Site Description

The KER-229 site was first recorded in 1951 by the ASA as part of its survey program. Many locations were assigned letter designations following ASA's general "39-" project field number. The area that would eventually be defined as KER-229 was originally designated by ASA as 39-B, 39-D, and 39-H. When AVC worked in the area in 1970 and 1971, these three areas were redesignated Ker-21-B, Ker-21-C, and Ker-21-E. These three AVC "sites" then became the three loci (B, C, and E, there being no locus A or locus D) (Figure 2).

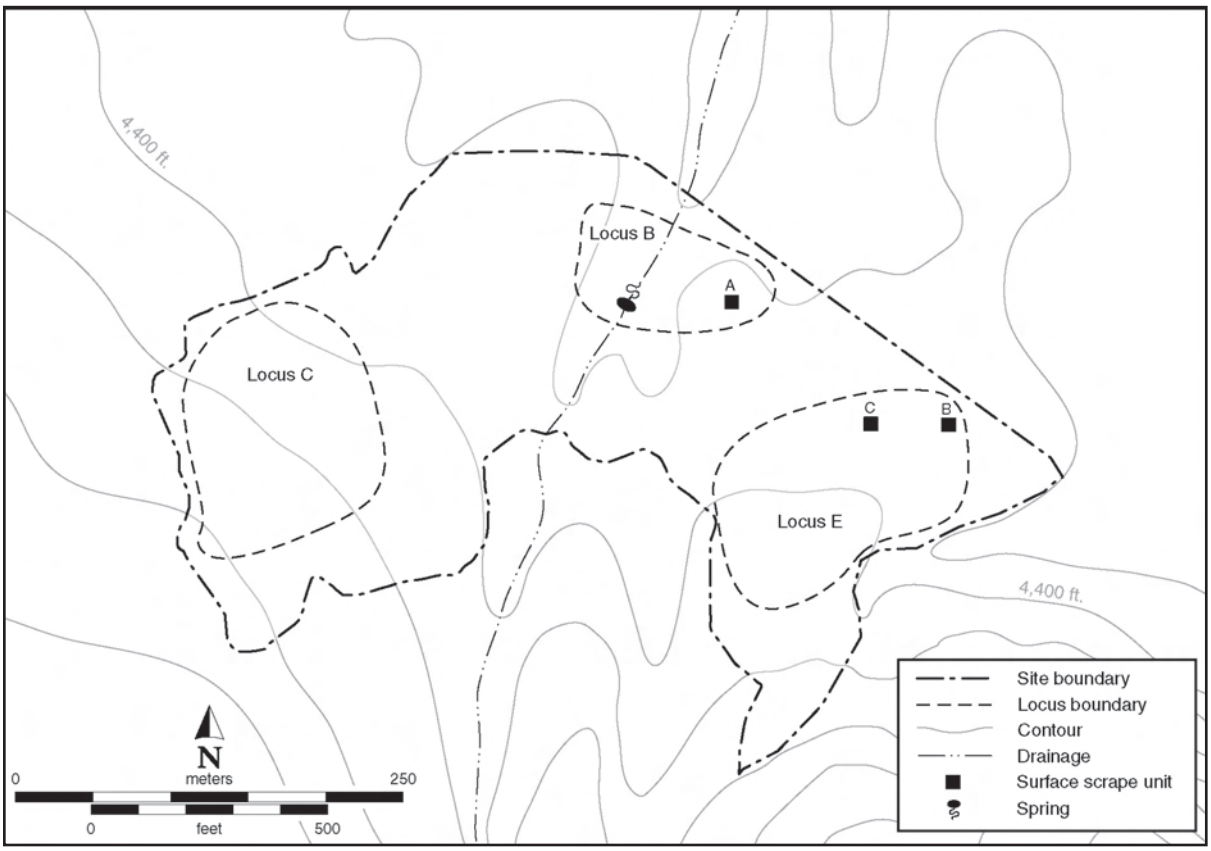

Figure 2. General map of CA-KER-229 showing loci.

The site consists of a small habitation area (Locus C), a number of bedrock milling features, and a large surface scatter of debitage, including mostly chert and chalcedony with some basalt, obsidian, and rhyolite. Roughly arc-shaped, KER-229 measures approximately 620 m east-west and 430 m north-south, encompassing some 125,000 m^2. From its western end (Locus C), the site slopes downhill to the northeast, continues across the major drainage from Nettle Spring, and extends southeast for some distance (Figure 2). A small spring is located within Locus B. The size, nature, and extent of this small spring was not determined.

Locus C

Locus C (Figure 3) is located at the western end of the site and contains a surface scatter of lithics, a small midden deposit, four circular depressions, three rock rings, one "hearth" feature, and one cairn. The circular depressions were called "house pits" (HP) by the AVC crew and were numbered 1 through 4 (e.g., HP-1).

Nine milling surfaces were observed near the west boundary of the locus (Figure 3). The milling surfaces were predominantly located on the flat portions of angular igneous boulders that were larger than about 1 m^2 (Figure 4). Three rock ring features were also observed at Locus C. These features ranged in size from 4 to 8 m in diameter and were constructed of angular to sub-angular igneous rocks. It is possible they were granary foundations.

Locus B

Locus B consisted of an extensive scatter of lithic materials and some tools generally in the center of the site (Figure 2). No features were noted at Locus B, but a small and shallow midden deposit was noted. A small spring is present, and a discrete lithic scatter was recorded in the area called "Black Hill" along the southern edge of the locus.

Locus E

Locus E lies on the eastern portion of the site (Figure 2) and contains the densest surface artifact scatter. Two hearth-like features and eight rock cairns were noted on the surface, but the function of these features is not known. One of the juniper trees within the locus showed evidence of a number of limbs having been removed with an ax or chopping tool rather than a modern saw. Notable amounts of lichen were observed growing on the exposed cut surfaces indicating that some amount of time had passed since the removal of the limbs.

Fieldwork

Fieldwork was undertaken at the site on at least three separate occasions. This included surface collections and possible excavations by ASA, surface collections and excavations by AVC, and surface mapping by CSUB. Each effort is discussed below.

The ASA Work

The ASA began working in the general area of Nettle Spring in 1954 (e.g., Price 1954) and collected some materials from KER-229 in 1956 (as evidenced by the materials transferred to CSUB), but there are no written records of the work. When AVC worked at KER-229 in 1971, wooden stakes, backdirt piles, and fragments of 1/8-in screen were observed on the surface of Locus C, suggesting some previous excavation, presumably by ASA. No further information on the ASA work at KER-229 is currently available.

The AVC Work

In 1970, AVC, under the overall direction of R. W. Robinson, began a program to investigate sites in the vicinity of Nettle Spring. The major focus of the work was KER-230, the largest and most complex site in the area, but a number of nearby sites were also investigated. In 1971, AVC conducted some mapping and test

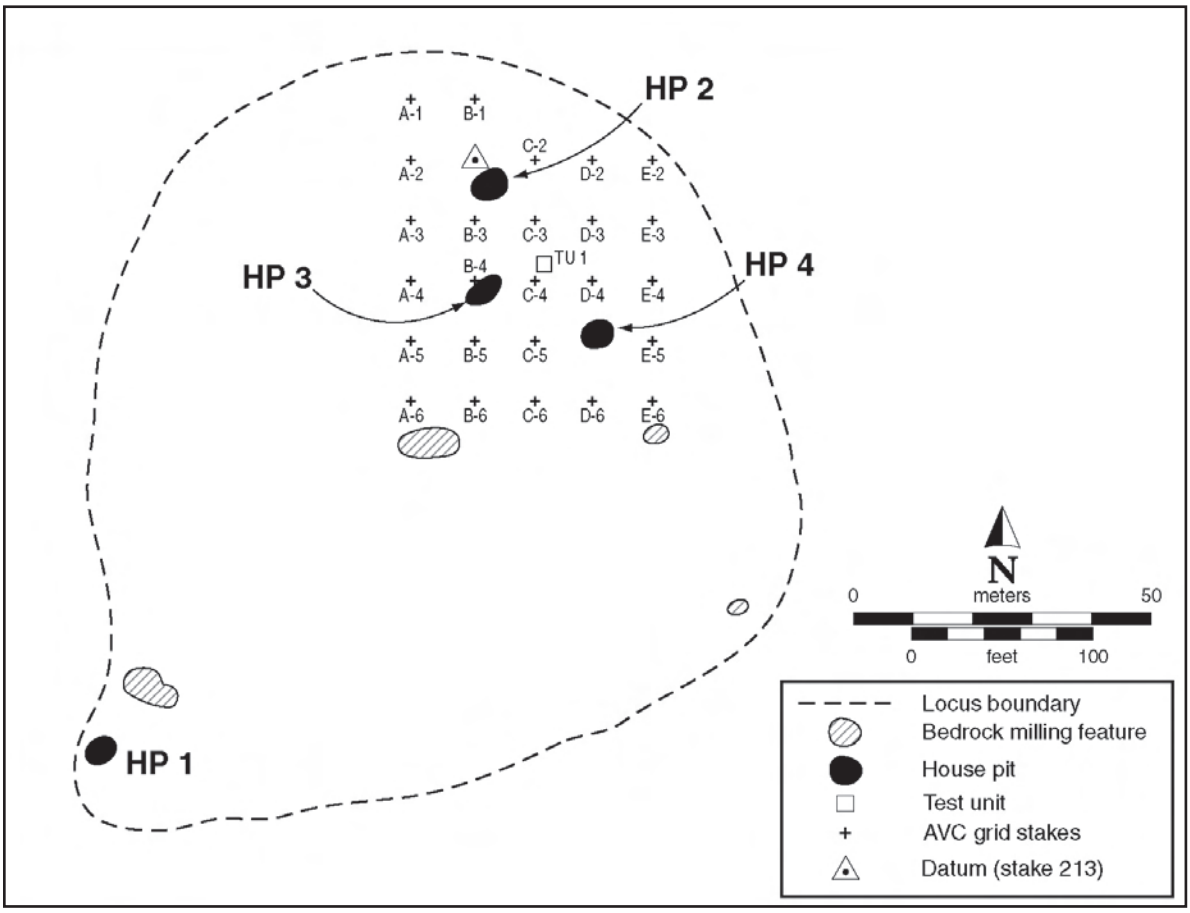

Figure 3. Map of Locus C, CA-KER-229, showing the grid, features, and unit excavated by Antelope Valley College in 1971.

excavations at KER-229 under the field direction of Irene Bussing, an AVC student. One of us (MQS, also then an AVC student) participated as a crew member.

The focus of the AVC research was the investigation of the structure depressions, presumably house pits, at Locus C (Figure 3), particularly since wooden structural posts were still preserved along the rim of HP-2. Some surface collections and test excavations were also undertaken at the other two loci.

AVC Field Methods

When AVC began work at KER-230 in 1970, an extensive grid was established over that site. That same grid was extended to the north to incorporate Locus C of KER-229 in order to maintain spatial integrity across the site complex. A 10-m grid (50 x 40 m) was laid out at Locus C in the area where the circular depressions were located (Figure 3). Stake 213 (Figure 3) served as the primary datum for the AVC work. The southeast corner of each grid square in Locus C served as the unit datum and grid unit designation, and thus grid C-4 extended north and east of the C-4 stake. None of the grid squares at Locus C were surface collected as a unit, but individual diagnostic items were collected from the squares.

A single 2 x 2-m test excavation unit (TU-1) was placed in the general deposit between HP-2 and HP-3

to determine the nature and content of the deposit outside the house pits. TU-1 was excavated as a 2 x 2-m unit to a depth of 10 cm and as a 1 x 2-m unit (the eastern half of the original unit) to bedrock at about 50 cm. All excavated material was removed using trowels and shovels and was screened through 1/8-in mesh.

House Pits 1 and 2 were excavated using different strategies. This involved the placement of a grid square over the depression followed by the excavation of selected units within the grid. In general, the materials exposed on the surface of the units were collected first. Next, the shallow layer of loose soil (≈ 1 to 3 cm) covering the structure was scraped away with a trowel to expose rocks, posts (in HP-2), and the compact soil that formed the rim and floor. The soil was then screened for cultural materials. Excavation stopped at the rims and floors.

A 10 x 10-m grid was established over HP-1, and a trench consisting of three 2 x 2-m units was excavated into the center of the depression (Figures 5 and 6). The southwest corner of each unit served as its datum, and each was labeled according to its position in the 10-m grid; for example, the southwest corner of excavation unit 4/0 was 4 m north and 0 m east of the grid datum. Three excavation units, 4/0, 4/2, and 4/4, were excavated to the floor of the feature.

At HP-2, an 8 x 8-m grid of 2 x 2-m units was established (Figure 7). Each of the units along the rim

Figure 4. One of the milling features at Locus C, CA-KER-229.

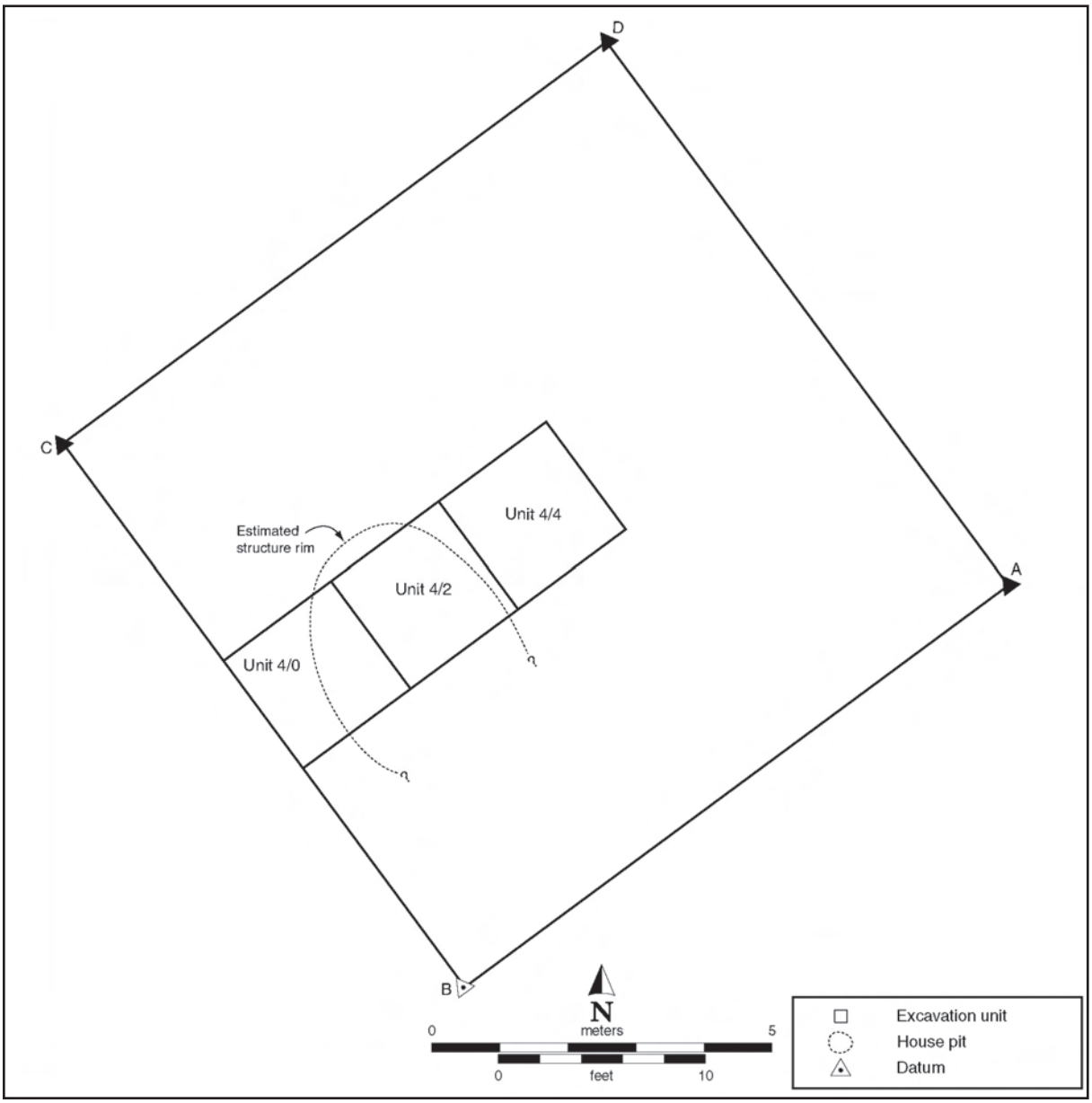

Figure 5. Map of grid placed over House Pit 1, Locus C, CA-KER-229.

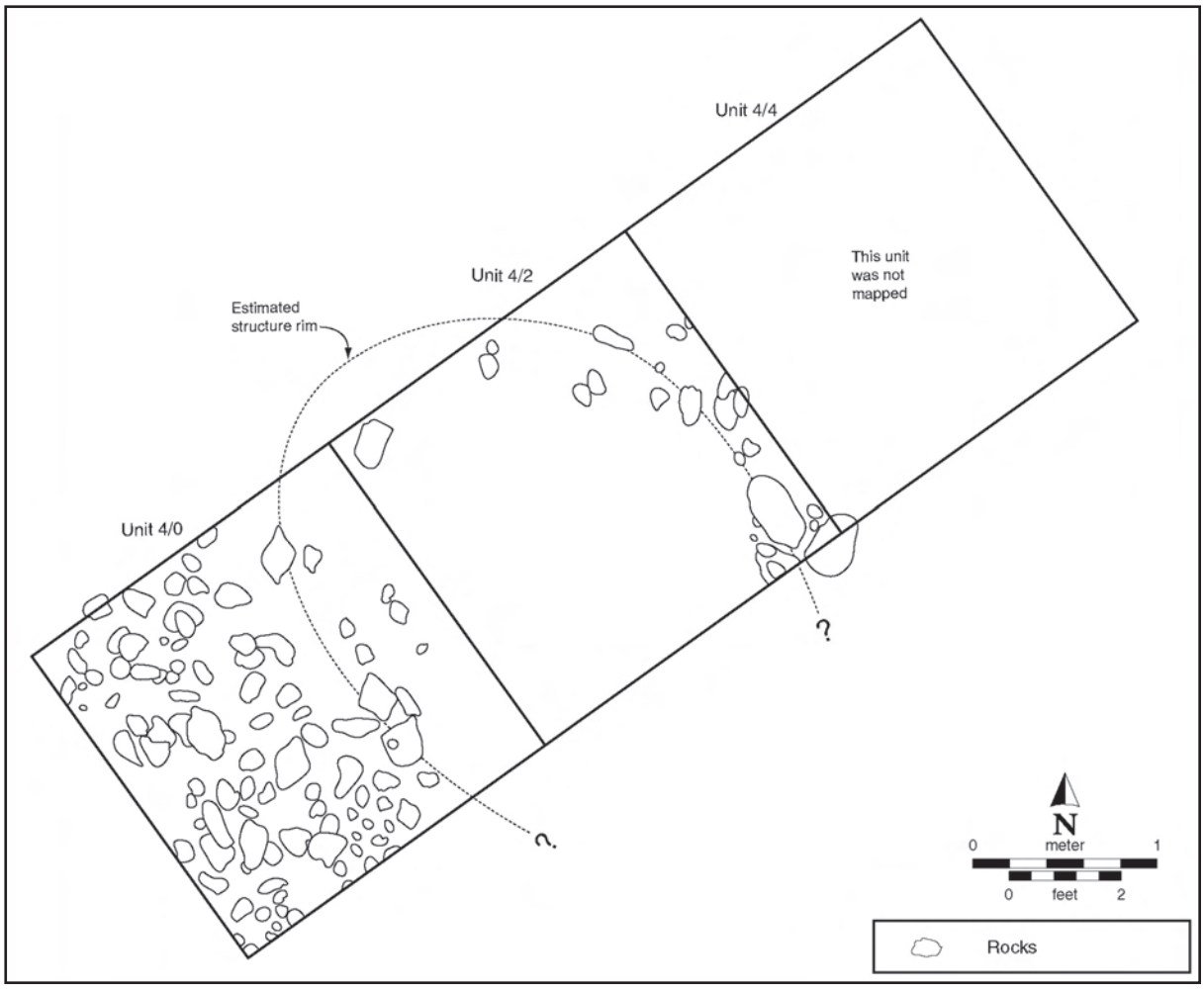

Figure 6. Detail map of the excavation of House Pit 1, Locus C, CA-KER-229.

(labeled GA-1 through GA-12) was excavated, but units in the center of the depression were left unexcavated. The units along the perimeter of the depression were excavated to expose the architectural details, particularly the rim and posts.

Both HP-3 (Figure 8) and HP-4 were mapped but not excavated with formal units. Instead, rocks along the rims of the depressions were located using an ice pick "probe," the soil around the rocks was removed to expose them, the rocks were mapped, and the soil was screened. Unfortunately, the map of HP-4 was not among the available records.

At Locus B, one 10 x10-m grid surface collection area (Square A) was established (Figure 2). The square was surface collected and "surface scraped" (the loose soil, ≈ 2-5 cm, was scraped up and screened). A 1 x 1-m test unit (Square A, Unit-1) was placed in the southwest corner of the square and excavated to 20 cm. The soil in the excavation unit was a grey midden to a depth of about 10 cm underlain by a sterile tan soil. Other diagnostic items were collected from the surface of Locus B.

Two 10 x 10-m units (designated squares B and C) were placed at Locus E. Each was surface collected and then "surface scraped." A 1 x 1-m test unit was

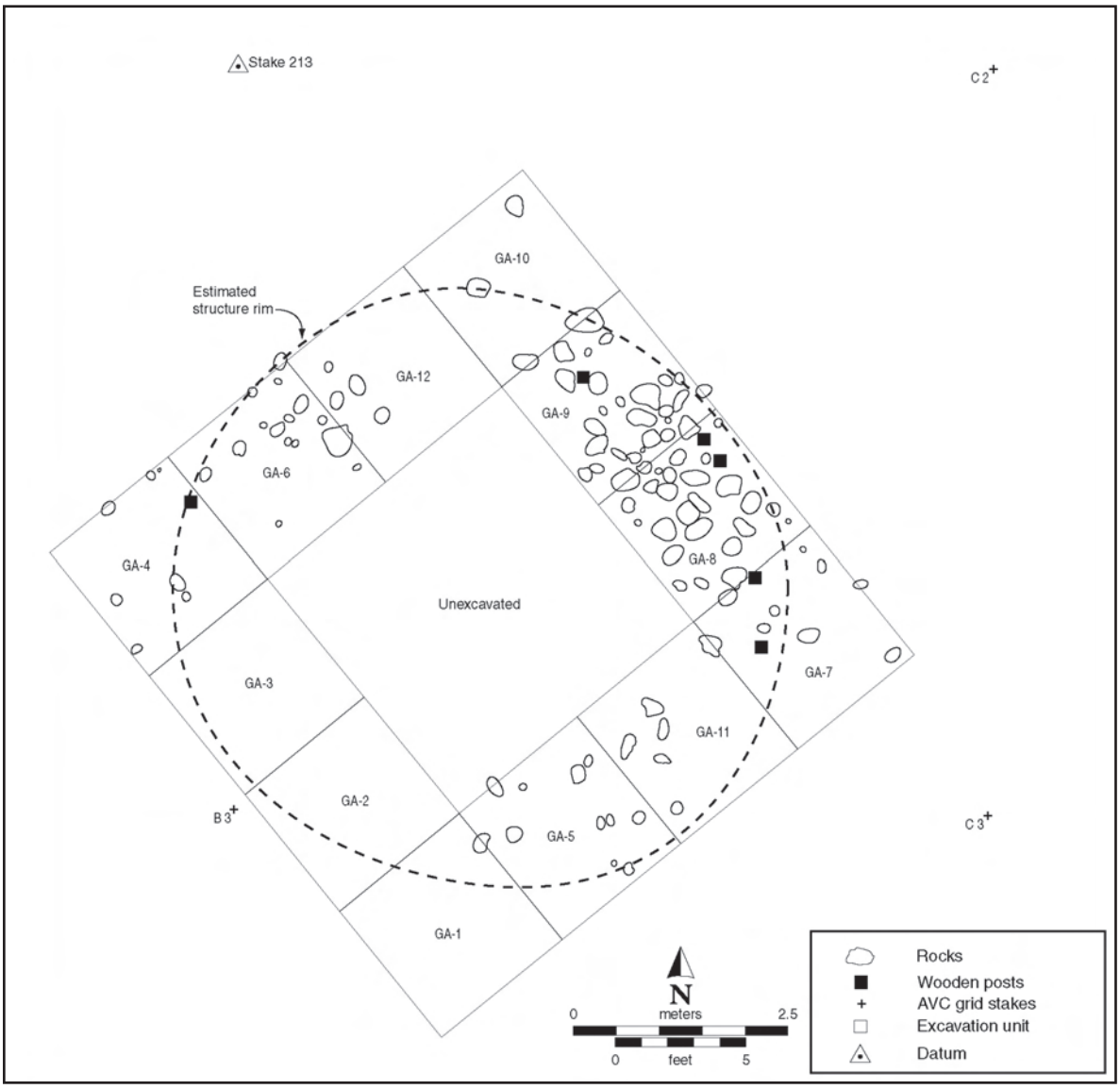

Figure 7. Map of the excavation of House Pit 2, Locus C, CA-KER-229.

placed in the southwest corner of Square B (designated Square B, Unit-1) and excavated to 20 cm. No excavation unit was placed in Square C. Other diagnostic items were collected from the surface of Locus E.

The CSUB Work

During July and August 2005, a noncollection surface inventory was conducted at KER-229 by one of us (BW). A 20-m grid was established over the entire site, and materials observed in each grid square were recorded. The border of the site was first delineated using wooden stakes, and then the grid was placed across the surface of the site using pin flags. Features and diagnostic artifacts were mapped using a Garmin E-Trex Legend GPS unit, while other materials were counted and recorded within each grid square. The GPS datum used was NAD 83, CONUS, Zone

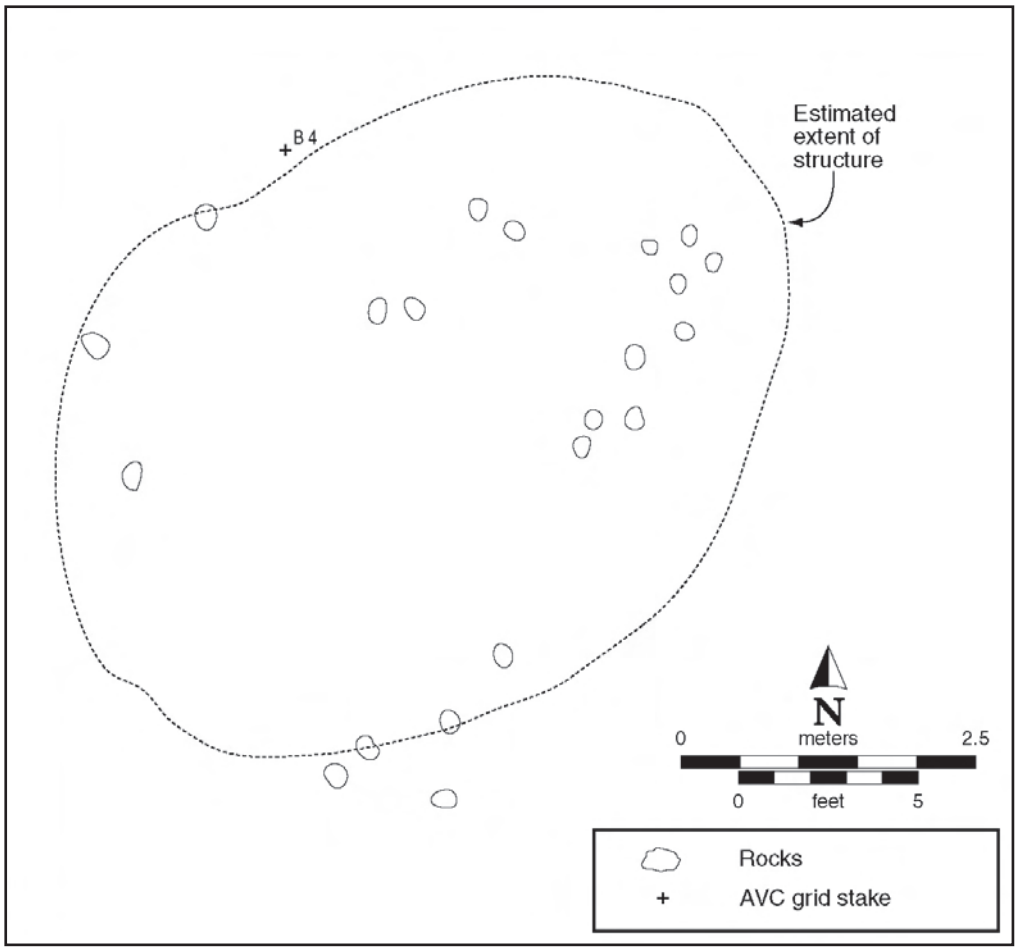

Figure 8. Map of House Pit 3, Locus C, CA-KER-229.

11. Once the work was completed, all pin flags and wooden stakes were removed. A small portion of the site situated outside the boundary of the Tomo-Kahni State Historic Park boundary was not included in the 2005 study.

This work resulted in the documentation of a number of prehistoric and historic features, some newly discovered, including hearths, bedrock milling features, and rock rings. In addition, many artifacts were noted and mapped, and an assessment of the distribution of surface debitage was conducted. A great deal of additional information on the site was obtained and is discussed below.

Laboratory Methods

The 1971 AVC collection from KER-229 was catalogued by AVC students in 1971. The material from Locus C was recatalogued by CSUB students in the 1990s, and new numbers were assigned. When the collection was transferred to Cal Poly Pomona in 2007, all the material was again reexamined and entered into four separate Excel spreadsheet files, one for each locus and one for material of unknown provenience.

Over the years, portions of the collections were sent out for analysis, with the unfortunate circumstance

that certain objects, particularly many of the projectile points and shell beads, were lost. Nevertheless, most of the records and collection were available for analysis.

Soils and Stratigraphy

Very little information regarding soils was obtained. At Locus B, the excavation unit (Square A, Unit 1) revealed a shallow grey midden to about 10 cm underlain by a sterile tan soil. At Locus C, TU-1 was excavated to determine the extent and content of the midden deposit, but very little information on the soils was recorded. The AVC field notes mentioned a "large" quantity of charcoal in the midden and the presence of rodent holes. A "coarse sandy soil" was noted in the 20 to 30 cm level of TU-1.

House Pit Features

Four circular depressions (HP-1 through HP-4) located at Locus C were investigated (Figure 3). Formal excavations were undertaken at HP-1 and HP-2, while HP-3 and HP-4 were only mapped with some surface soil being screened. No information on HP-4 was present in the available records.

House Pit 1

House Pit 1 (Figures 5 and 6) was an oval depression approximately 2 m in diameter and between 30 and 40 cm in depth. A 6 x 2-m trench was excavated across the center of the depression. This excavation revealed a rock-lined rim, surviving portions of a prepared floor (i.e, purposefully constructed of wet-laid clay) but no hearth feature. This house pit appears to represent the foundation of a lightly built, shallow "wickiup-like" structure of unknown age and uncertain function. The presence of a prepared floor suggests it may have been domestic in nature.

House Pit 2

House Pit 2 (Figure 7) was a circular depression that measured approximately 7 m in diameter. Excavation of the feature was confined to the rim; the center of the depression was not excavated. The rim was lined with many rocks, presumably to support a superstructure. A prepared floor was evident along the edges of the depression and presumably extended into its center. No hearth or other features were located. A large number of artifacts and considerable faunal material were found in association with HP-2.

Six juniper posts were found along the rim (Figure 7). These relatively small posts appear to have been sharpened prior to being placed into the ground. The exposed (proximal) ends of most of the specimens were charred, suggesting that the structure had burned.

The presence of considerable faunal material suggests food preparation, the many broken tools and debitage suggest tool rejuvenation, and the presence of personal items (e.g., beads and ornaments) suggests a domestic function. Thus, this feature is interpreted as a domestic structure, likely for a family.

House Pit 3

House Pit 3 (Figure 8) is an oval depression, approximately 4 x 6 m and was not excavated. No posts were visible, no hearth was observed, and while some rocks were noted on the surface, the extent of the foundation was not determined.

House Pit 4

House Pit 4 was mapped in the same manner as HP-3, but the notes were not present in the available records. Thus, there is no information on HP-4 aside from its location (Figure 3).

Material Culture

A considerable variety of materials were recovered from KER-229. These include prehistoric artifacts of ground stone, flaked stone, ornaments, faunal remains, and botanical remains (including perishable structure posts). Some important historical materials, apparently used by Native peoples, were also recovered. All this material is described and discussed below.

Ground Stone

The ground stone collection from KER-229 consists of 103 specimens, including metates, manos, bowls, pestles, a pigment grinder, a shaft straightener, stone pendants, stone beads, and a pointed stone tool. Each category is described below. In addition to these specimens, 45 additional pieces of ground stone were observed on the site surface in 2005, including fragments of manos, pestles, and stone bowls.

Metates

Twelve portable metate fragments were found at KER-229 (Table 1). Of these, five are rhyolite, four are sandstone, and three are andesite. No granite specimens were recovered. Nine of the metate fragments were found at Locus E, two at Locus B, and one at Locus C (but nine bedrock milling features containing metates were present at Locus C). This material distribution is similar to that of the manos.

Manos

Fifty-seven manos and mano fragments (Table 2) were collected from the site. Of that number, nine are complete specimens (five from Locus C and two each from loci B and E). Of the total number, 18 came from Locus C, 18 from Locus B (including two from Black Hill), and 21 from Locus E. Of the 25 typed specimens, one is trifacial, 15 are bifacial, and nine are unifacial. Six of the specimens (all fragments) were burned.

The 57 specimens were made from a variety of materials: 15 of rhyolite, 12 of sandstone, eight of basalt, eight of granite, seven of andesite, two of tuff, two of diorite, and one each of monzonite, schist, and limestone. Of interest is the fact that all the basalt specimens (all fragments) came from Locus B, but only one metate fragment was found at Locus B. The total weight of the eight basalt fragments is 686.2 g.

Bowls

Two fragments of stone bowls, one sandstone and one rhyolite, were collected, both from the surface of Locus B (Table 3). Several other bowl fragments were observed on the surface of the site in 2005.

Pestles

Eight pestle fragments were found, all in Locus C (Table 3). Pestles would presumably be used in mortars or bowls. There are no bedrock mortars at the KER-229 site, but there are over 400 mortars at the nearby KER-230 site. It is also possible that wooden mortars were used at KER-229.

Pigment Grinder

A small "mano" (Cat. No. 005; Table 3) found on the surface of Locus C shows a red stain on its surface. It is believed that this artifact was used to grind hematite (red ochre). A number of fragments of hematite and limonite (yellow ochre) were recovered.

Shaft Straightener

A steatite shaft straightener fragment (Cat. No. 752; Figure 9a; Table 3) was discovered on the surface of Locus E. While the source of this steatite is not

Table 1. Provenience and Attributes[a] of Metates from CA-KER-229.

Cat. No.	Provenience	Material	Attributes	Length	Width	Thickness	Weight	Condition
567	Locus B, Square A, surf.	rhyolite	–	94.6	40.4	45.6	224.1	fragment
507	Locus B, surf	andesite	–	90.9	60.8	28.2	182.5	fragment
215	Locus C, HP-1, GA-3, surf	andesite	–	not in collection				fragment
740	Locus E, Square B, surf	andesite	–	97.2	81.4	52.7	432.9	fragment
649	Locus E, Square B, scrape	rhyolite	–	97.4	50.3	43.1	277.5	fragment
702	Locus E, Square B, scrape	sandstone	–	49.7	32.4	23.6	29.7	fragment
703	Locus E, Square B, scrape	sandstone	–	106.5	96.2	21.7	143.0	fragment
704	Locus E, Square B, scrape	sandstone	bifacial, burned	98.5	52.9	54.6	319.3	fragment
1065	Locus E, Square C, scrape	sandstone	unifacial	300.0	290.0	80.0	–	complete
665	Locus E, Square C, scrape	rhyolite	–	96.0	89.4	62.2	509.8	fragment
725	Locus E, Square C, scrape	rhyolite	burned	95.9	84.1	58.4	316.3	fragment
743	Locus E, Square C, scrape	rhyolite	unifacial	62.9	57.1	12.7	39.3	fragment

a. Metrics in millimeters and grams.

known, an important source exists in the Sierra Pelona, in the Transverse Ranges approximately 56 km to the south (Rosenthal and Williams 1992). Fragments of steatite bowls, beads, and other artifacts are known from nearby KER-230 (Allen and Burns 2008:22-23).

Pendants

Nine artifacts identified as pendants were found (Table 3), four of which are certain and five of which are possible. Of the certain specimens, one is steatite and perforated (Cat. No. 213; Figure 9b), two are green schist (see Figure 9c), and one is a fine-grained siltstone. The source of the steatite is unknown.

The five possible pendants of a fine-grained "chalky" siltstone (Table 3) appear to be blanks, as all have ground surfaces and/or shaped edges. Two are incised. Interestingly, all of the pendants came from Locus C, while all but one of the possible pendants came from Locus E. This siltstone occurs in the immediate vicinity of the site, with a major outcropping being present at KER-230.

Stone Beads

Four stone beads were recovered from the site, three of steatite and one of fine-grained siltstone (Table 4). Beads of steatite are known from the nearby sites of KER-230 (Allen and Burns 2008:23), CA-KER-2357 (Ptomey 1991), Teddy Bear Cave (CA-KER-508) (Sutton 2001:8-9), and at Red Rock Canyon Rockshelter (CA-KER-147) (Sutton et al. 2009:62-63). Such beads are common but rarely numerous in sites in the western Mojave Desert (Sutton 1988:44). The source of the steatite is not known.

One of the steatite beads (Cat. No. 887; Figure 9d) is a large tubular biconically drilled specimen found on the surface of Locus B. It measures 29 mm long and 12 mm in diameter.

Pointed Stone Tool

The midsection (oval in cross section) of a pointed tool was found on the surface of Locus B. The specimen (Cat. No. 514) was made of fine-grained siltstone,

Table 2. Provenience and Attributes[a] of Manos from CA-KER-229.

Cat No.	Provenience	Material	Attributes	Length	Width	Thick	Weight
Complete							
505	Locus B, surf	granite	–	60.5	5.9	2.4	112.8
520	Locus B, surf	diorite	trifacial	150.0	67.8	72.1	1,200.8
001	Locus C, surf	andesite	unifacial	113.6	103.6	65.5	1,020.6
002	Locus C, surf	granite	bifacial	104.8	92.3	59.2	917.5
003	Locus C, surf	rhyolite	bifacial	78.5	61.1	48.9	282.6
007	Locus C, surf	schist	bifacial, shaped	79.7	45.3	36.9	167.7
016	Locus C, surf	andesite	unifacial	76.0	67.0	41.0	295.8
614	Locus E, surf	granite	bifacial	103.2	86.8	57.8	725.9
615	Locus E, surf	granite	bifacial	104.1	91.4	66.9	813.3
Fragments							
506	Locus B, surf	sandstone	–	67.8	44.4	21.4	51.0
517	Locus B, surf	granite	–	89.4	37.4	40.4	202.9
518	Locus B, surf	granite	–	75.1	54.8	50.7	272.3
519	Locus B, surf	basalt	–	74.1	42.1	50.2	178.4
521	Locus B, surf	basalt	–	73.0	52.9	49.4	289.1
522	Locus B, surf	basalt	burned	91.1	66.1	33.2	165.2
523	Locus B, surf	basalt	burned	99.0	57.9	51.6	298.5
524	Locus B, surf	basalt	–	89.8	46.3	43.8	232.4
525	Locus B, surf	basalt	–	66.5	64.9	56.1	332.9
526	Locus B, surf	basalt	–	97.5	61.3	33.1	214.8
527	Locus B, surf	basalt	–	95.2	66.7	36.0	337.3
528	Locus B, surf	sandstone	–	72.5	70.0	31.0	133.7
568	Locus B, Square A, surf	sandstone	burned	85.3	57.2	43.6	226.6
594	Locus B, Black Hill, surf	rhyolite	–	109.6	58.4	41.6	404.6
595	Locus B, Black Hill, surf	rhyolite	–	75.1	39.5	32.0	85.7
015	Locus C, surf	rhyolite	unifacial	88.0	65.0	69.0	507.0
017	Locus C, surf	andesite	bifacial	64.0	53.0	63.0	274.7
025	Locus C, surf	rhyolite	unifacial	89.1	75.5	42.9	289.2
026	Locus C, surf	limestone	unifacial	72.4	55.2	37.1	144.9
027	Locus C, surf	rhyolite	bifacial	85.3	65.9	35.5	198.1
028	Locus C, surf	sandstone	bifacial	58.8	86.7	44.4	240.3
029	Locus C, surf, near HP- 1	tuff	bifacial	161.0	91.7	79.8	1,233.6
030	Locus C, surf, near HP-1	sandstone	bifacial, shaped	140.7	110.6	91.6	1,834.1

Table 2. *(Continued)*

Cat No.	Provenience	Material	Attributes	Length	Width	Thick	Weight
Fragments							
037	Locus C, surf, near HP-1	rhyolite	bifacial, shaped, made from broken pestle	164.0	130.5	86.0	3,586.6
038	Locus C, surf, near HP-1	granite	unifacial	202.0	103.0	96.0	2,411.3
252	Locus C, HP-2, GA-2, surf	sandstone	–	95.0	69.0	58.1	476.7
291	Locus C, TU-1, 20-30	andesite	bifacial	25.1	53.0	46.5	63.9
347	Locus C, HP-2, GA-11, screen	rhyolite	–	49.0	35.6	21.9	32.8
663	Locus E, Square C, scrape	rhyolite	burned	80.5	54.2	53.4	234.3
664	Locus E, Square C, scrape	sandstone	–	92.6	29.7	46.9	119.4
666	Locus E, surf	rhyolite	–	71.9	61.1	39.9	282.4
667	Locus E, surf	rhyolite	–	74.2	54.8	54.1	251.7
668	Locus E, surf	rhyolite	–	61.7	44.0	42.3	115.7
669	Locus E, surf	rhyolite	bifacial	95.1	41.1	38.0	199.8
678	Locus E, surf	sandstone	unifacial	38.3	34.1	9.9	4.1
706	Locus E, surf	diorite	unifacial	115.5	93.0	49.5	683.1
712	Locus E, surf	rhyolite	–	73.8	63.7	48.9	226.4
719	Locus B, Black Hill, surf	tuff	–	90.2	57.3	52.5	236.3
735	Locus E, Square B, surf	sandstone	–	93.4	67.2	44.9	291.2
736	Locus E, Square B, surf	sandstone	unifacial	103.6	75.5	49.8	476.2
737	Locus E, Square B, surf	sandstone	–	51.2	47.4	23.9	503.5
738	Locus E, Square B, surf	andesite	burned	72.1	57.4	48.2	191.0
739	Locus E, Square B, surf	andesite	–	63.6	63.6	28.9	139.1
742	Locus E, Square C, scrape	granite	–	54.4	31.5	37.7	75.8
744	Locus E, Square C, scrape	sandstone	bifacial	93.6	54.7	30.9	187.3
745	Locus E, Square C, scrape	monzonite	bifacial, burned	89.2	66.4	50.9	413.7
746	Locus E, Square C, scrape	andesite	–	52.4	30.5	12.8	17.0
761	Locus E, Square C, scrape	rhyolite	–	66.5	51.2	42.8	154.2

a. Metrics in millimeters and grams.

Table 3. Provenience and Attributes[a] of Other Ground Stone Artifacts from CA-KER-229.

Cat. No.	Provenience	Artifact	Material	Condition	Length	Width	Thick	Weight	Fig.
515	Locus B, surf	bowl	sandstone	fragment	96.4	83.6	6.0	413.5	
516	Locus B, surf	bowl	rhyolite	fragment	79.9	74.6	36.1	137.1	
004	Locus C, surf	pestle	sandstone	fragment	89.8	81.8	76.2	750.6	
030	Locus C, surf	pestle	andesite	tip	76.5	97.5	71.0	423.1	
032	Locus C, surf, outside HP-1	pestle	granite	fragment	212.0	134.0	83.0	2,850.2	
034	Locus C, surf, outside HP-1	pestle	sandstone	fragment	181.0	143.0	97.0	2,724.0	
035	Locus C, surf, outside HP-1	pestle	granite	fragment	140.0	115.0	–	–	
036	Locus C, surf, outside HP-1	pestle	granite	fragment	221.0	109.0	–	3,064.5	
175	Locus C, C-4, surf	pestle	andesite	fragment	23.3	48.6	37.6	28.1	
205	Locus C, HP-2, GA-4, scrape	pestle	andesite	fragment	54.8	48.8	16.8	45.7	
005	Locus C, surf	pigment grinder	andesite	fragment	57.6	55.6	37.2	138.9	
752	Locus E, surface	shaft straightener	steatite	fragment	59.5	36.9	15.8	51.8	9a
113	Locus C, TU-1, 0-10	pendant	siltstone	fragment	42.1	21.3	3.0	3.35	
213	Locus C, HP-2, GA-4, scrape	pendant	steatite	perforated (3.7 mm perf dia)	26.5	12.1	3.2	1.56	9b
256	Locus C, HP-2, GA-2, scrape	pendant	green shist	fragment	13.8	8.2	1.0	0.18	
435	Locus C, HP-2, GA-10, scrape	pendant	green shist	fragment	24.2	17.1	1.3	0.65	9c
670	Locus E, surf	possible pendant	siltstone	incised, burned	60.6	55.3	8.3	33.7	
671	Locus E, surf	possible pendant	siltstone	ground surface	64.2	52.5	11.4	43.1	
672	Locus E, surf	possible pendant	siltstone	edges worked	65.3	32.0	7.0	20.4	
713	Locus E, surf	possible pendant	siltstone	ground surface	76.1	57.0	17.7	70.2	
513	Locus B, surf	possible pendant	siltstone	fragment, incised	17.8	14.8	3.4	1.1	
548	Locus B, Square A, surf	worked piece	steatite	fragment	16.1	9.8	5.5	1.0	
1048	Locus E, surf	unidentified	sandstone	fragment	35.0	30.0	15.0	–	
1049	Locus E, surf	unidentified	tuff	fragment	47.0	40.0	14.0	–	

a. Metrics in millimeters and grams.

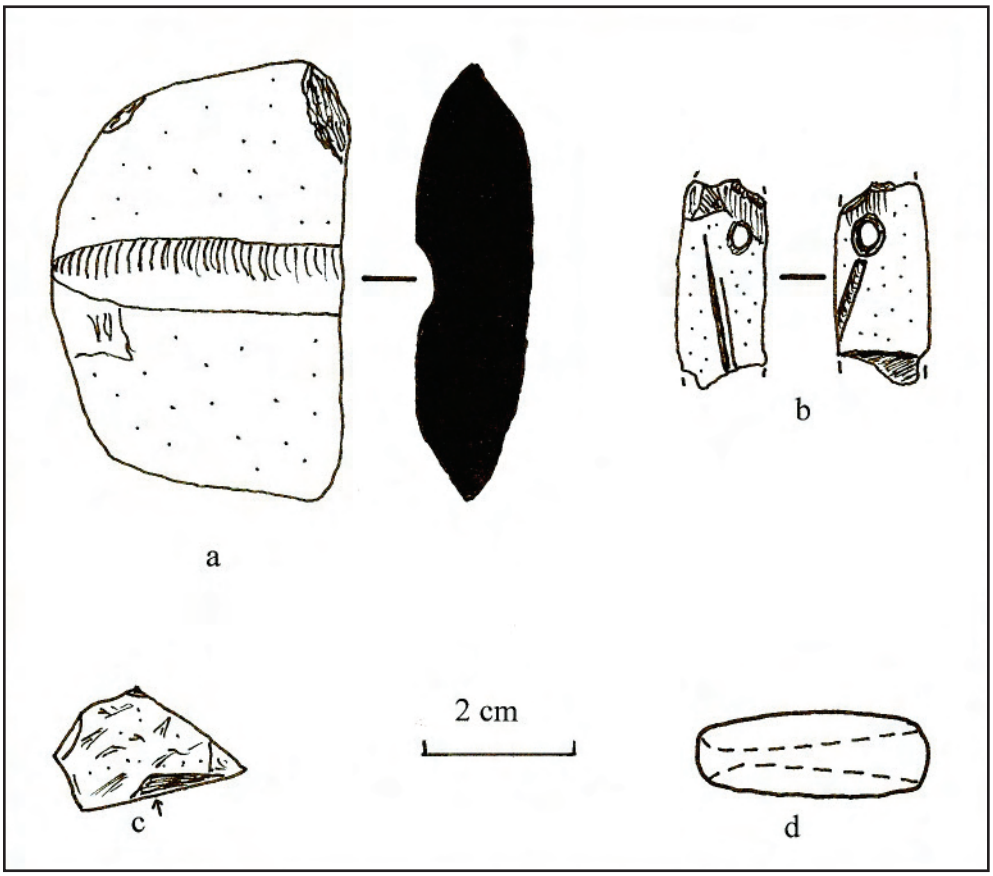

Figure 9. Selected ground stone artifacts from CA-KER-229: (a) steatite shaft straightener (Cat. No. 752); (b) perforated steatite pendant fragment (Cat. No. 213); unperforated green schist pendant fragment (Cat. No. 435), arrow indicates worked edge; and (d) steatite bead (Cat. No. 887), drawn from field sketch, note perforation outline.

Table 4. Provenience and Attributes[a] of Stone Beads from CA-KER-229.

Cat. No.	Provenience	Material	Dia.	Perforation Dia.	Thick	Weight	Comments
887	Locus B, surface	steatite	12.0	–	–	–	tubular, biconically drilled, tapered at both ends, Fig. 9d
417A	Locus C, HP-2, GA-6, scrape	steatite	4.0	2.0	–	0.1	
222	Locus C, HP-2, GA-3, scrape	steatite	4.4	2.1	0.6	0.1	
243	Locus C, HP-2, GA-1, scrape	steatite	6.8	2.4	1.5	0.9	
300	Locus C, TU-1, 20-30	siltstone	–	–	2.5	0.1	

a. Metrics in millimeters and grams.

measures 19.8 x 8.0 x 4.2 mm, and weighs 0.9 g. The piece was ground smooth and resembles an awl. Its function is unknown.

Other

One piece of worked steatite (Cat. No. 548; Table 3) was found at Locus B, Square A. Its original form, function, and geological source are unknown.

Seven small pieces of ochre, four of hematite and three of limonite, were found. Six of the pieces came from Locus C, with one piece of hematite being found at Locus E. A small "mano" with a hematite stain was found at Locus C.

Flaked Stone

The flaked stone assemblage includes projectile points, bifaces, unifaces, cores, hammerstones, and debitage. Each category is discussed below. Additional artifacts of flaked stone were mapped on the surface of the site in 2005. These included projectile points (Cottonwood and Desert Side-notched); unidirectional, multidirectional, and bifacial cores; and edge-modified flakes.

Projectile Points

Fifty-one projectile points were recovered from the site (see Table 5), nine of which are complete. Forty-seven of the points are missing from the collection, and 28 had not been classified as to type before they were lost. The 23 classified points consist of the following types: three Desert Side-notched, 11 Cottonwood, six Rose Spring), two Elko, and one Gypsum (Figure 10). Of the 51 points, 32 (62.7 percent) are obsidian, 8 rhyolite, with the remainder being silicate (n = 4), chalcedony (n = 4), jasper (n = 2), and chert (n = 1).

Provenience is known for all but three of the points: 17 (35.4 percent) from Locus B; 17 (35.4 percent) from Locus E; and 14 (29.2 percent) from Locus C (Table 6). Where the forms are known, 15 are bases, 10 are tips, and four are midsections. This suggests that projectiles were being retooled at the site.

Bifaces

Thirty bifaces, three complete and 27 fragments, were collected (Table 7). Eight (26.7 percent) are obsidian, six silicate (20.0 percent), six chalcedony (20.0 percent), four rhyolite (13.3 percent), four chert (13.3 percent), one jasper (3.3 percent), and one unknown (3.3 percent). No obsidian cores were found, suggesting that the obsidian bifaces were imported in generally finished form. A small number of obsidian biface-thinning flakes were identified (see below), indicating that at least some obsidian bifaces were reduced or reworked at the site. Most (18; 60 percent) of the bifaces came from Locus B, five (16.7 percent) from Locus E, two (6.7 percent) from Locus C, and five (16.7 percent) from unknown locations.

Drill

The base of a small silicate drill (Cat. No. 977) was recovered from the surface of Square C in Locus E. The specimen measures 23 x 10 x 6 mm.

Scrapers

Thirteen artifacts identified as "scrapers" were recovered (Table 8). Five came from the surface of Locus B, three from the surface of Locus C, and five from Locus E (three from the surface and one each from Surface Scrapes B and C). Five specimens are chalcedony, four silicate, three rhyolite, and one jasper. As all these artifacts are now missing from the collection, their classifications cannot be confirmed.

Cores

Twenty-nine cores were collected from the site (Table 9). Eight cores were recovered from Locus C, seven

Table 5. Provenience and Attributes[a] of Projectile Points from CA-KER-229.

Cat. No.	Type	Provenience	Material	Length	Width	Thickness	Weight	Comments	Fig.[b]
Complete									
014	Cottonwood, concave base	Locus C, surf	obsidian	24.0	13.0	3.0	–	missing	10a
856	Cottonwood, straight base	Locus B, surf	rhyolite	52.0	25.0	–	–	missing	10b
983	Cottonwood	Locus E, surf	obsidian	15.0	12.0	–	–	missing	
986	Rose Spring	Locus E, surf	obsidian	21.0	11.0	2.0	–	missing	10c
987	Rose Spring	Locus E, surf	obsidian	18.0	16.0	10.0	–	missing	10d
813	Rose Spring	unknown	obsidian	14.4	7.0	3.8	1.91		10e
817	Rose Spring	unknown	obsidian	12.2	7.5	3.9	2.39		10f
818	Rose Spring	unknown	obsidian	11.5	6.0	3.0	2.15	missing	10g
421	unknown	Locus C, HP-2, GA-5, screen	rhyolite	43.0	37.0	5.0	–	missing	
Fragments									
039	Cottonwood	Locus C, surf	obsidian	14.0	13.0	–	–	base, missing	
253	Cottonwood	Locus C, HP-2, GA-2, screen	rhyolite	21.0	9.0	–	–	missing	10h
990	Cottonwood	Locus E, surf	obsidian	15.0	15.0	2.0	–	base, missing	10i
991	Cottonwood	Locus E, surf	obsidian	12.0	9.0	2.0	–	base, missing	10j
975	Cottonwood	Locus E, Square C, surf	rhyolite	32.0	10.0	6.0	–	missing	10k
981	Cottonwood	Locus E, Square B, surf	obsidian	15.0	12.0	–	–	base, missing	
1003	Cottonwood	Locus E, Square C, scrape	rhyolite	24.0	–	–	–	base, serrated, missing	10l
148	Desert Side-notched	Locus C, surf	obsidian	20.0	15.0	–	–	base, missing	
965	Desert Side-notched	Locus B, surf	silicate	24.0	18.0	–	–	base, missing	10m
988	Desert Side-notched	Locus E, surf	obsidian	28.0	18.0	–	–	missing	10n
889	Cottonwood	Locus B, surf	rhyolite	17.0	11.0	4.0	–	base, missing	10o
266	Rose Spring?	Locus C, TU-1, 40-bedrock	obsidian	14.0	12.0	–	–	base, missing	10p
888	Elko?	Locus B, surf	rhyolite	23.0	12.0	4.0	–	base, missing	10q
893	Elko?	Locus B, surf	chalcedony	18.0	17.0	4.0	1.03	base, missing	
964	Gypsum?	Locus B, surf	silicate	32.0	31.0	–	–	base, missing	
880	unknown	Locus B, surf	obsidian	25.0	18.0	–	–	fragment, missing	
882	unknown	Locus B, surf	obsidian	15.0	11.0	–	–	fragment, missing	
886	unknown	Locus B, surf	jasper	14.0	9.0	–	–	tip, missing	
890	unknown	Locus B, surf	obsidian	18.0	10.0	3.0	–	tip, missing	

Table 5. *(continued)*

Cat. No.	Type	Provenience	Material	Length	Width	Thickness	Weight	Comments	Fig.[b]
Fragments									
891	unknown	Locus B, surf	obsidian	13.0	9.0	2.0	–	base, missing	
892	unknown	Locus B, surf	obsidian	10.0	9.0	2.0	–	midsection, missing	
894	unknown	Locus B, surf	jasper	15.0	15.0	6.0	–	midsection, missing	
895	unknown	Locus B, surf	chalcedony	32.0	15.0	5.0	–	tip, missing	
896	unknown	Locus B, surf	chert	21.0	17.0	4.0	–	tip, missing	
930	unknown	Locus B, surf	obsidian	14.0	7.0	–	–	tip, missing	
931	unknown	Locus B, surf	silicate	12.0	7.0	–	–	tip, missing	
029	unknown	Locus C, surf	chalcedony	22.0	17.0	9.0	–	tip, missing	
044	unknown	Locus C, surf	silicate	28.0	15.0	7.5	–	poss. preform, missing	
089	unknown	Locus C, surf	obsidian	12.0	8.0	–	–	tip, missing	
184	unknown	Locus C, surf	obsidian	23.0	9.0	–	–	frag., missing	
202	unknown	Locus C, HP-2, GA-4, screen	obsidian	15.0	9.0	–	–	missing	
212	unknown	Locus C, HP-2, GA-4, screen	obsidian	6.7	6.4	1.2	0.06	tip	
290	unknown	Locus C, TU-1, 30-40	obsidian	10.0	8.0	–	–	midsection, missing	
468	unknown	Locus C, surf	obsidian	14.0	13.0	–	–	base, missing	
753	unknown	Locus E, surf	rhyolite	38.4	21.3	9.0	6.05	base, missing	
972	unknown	Locus E, Square B, surf	chalcedony	31.0	20.0	5.0	–	missing	
979	unknown	Locus E, Square B, surf	obsidian	27.0	9.0	–	–	missing	
1058	unknown	Locus E, Square B, surf	obsidian	13.0	13.0	2.0	–	tip, missing	
622	unknown	Locus E, Square B, scrape	obsidian	10.2	8.5	1.9	0.10	tip, missing	
623	unknown	Locus E, Square B, scrape	obsidian	9.1	5.0	2.1	0.15	tip, missing	
1062	unknown	Locus E, Square B, scrape	obsidian	9.0	9.0	3.0	–	midsection, missing	
976	unknown	Locus E, Square C, surf	obsidian	17.0	11.0	–	–	missing	

a. Metrics in millimeters and grams. Most of the specimens are missing from the collection.
b. These figures were redrawn from sketches in the original catalog.

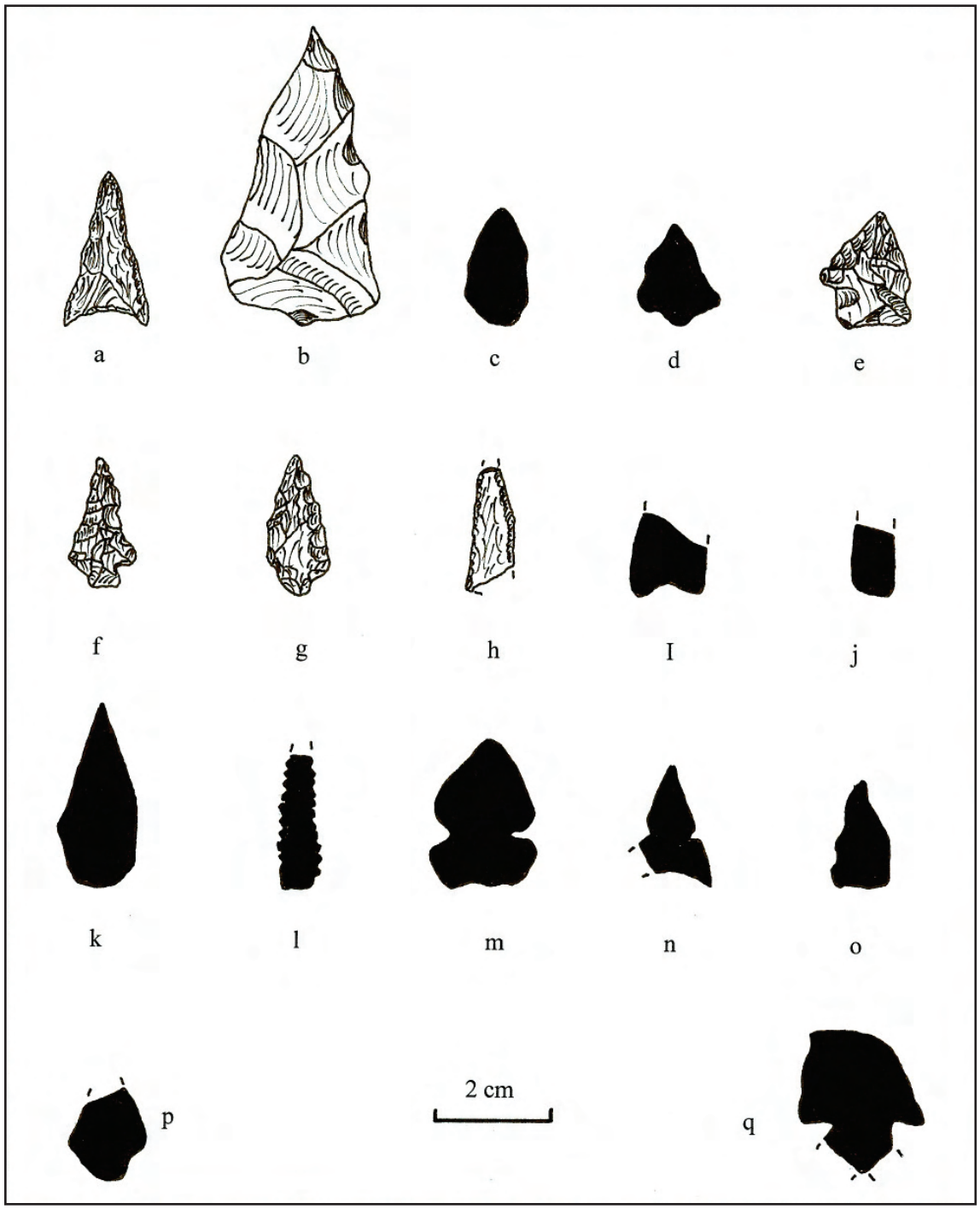

Figure 10. Selected projectile points from CA-KER-229: (a) Cottonwood (Cat. No. 014);(b) Cottonwood (Cat. No. 856); (c) Rose Spring (Cat. No. 986); (d) Rose Spring (Cat. No. 987); (e) Rose Spring (Cat. No. 813); (f) Rose Spring (Cat. No. 817); (g) Rose Spring (Cat. No. 818); (h) Cottonwood (Cat. No. 253); (i) Cottonwood (Cat. No. 990); (j) Cottonwood (Cat. No. 991); (k) Cottonwood (Cat. No. 975); (l) Cottonwood (Cat. No. 1003); (m) Desert-side Notched (Cat. No. 965); (n) Desert-side Notched (Cat. No. 988); (o) Cottonwood (Cat. No. 889); (p) Rose Spring (Cat. No. 266); and (q) Elko (Cat. No. 888). Note that many of the points are missing from the collection, and only their outlines (shown in silhouette) were available from the catalog.

Table 6. Projectile Point Type and Provenience Matrix, CA-KER-229.

Type/Provenience	Locus C			Locus B, Surface	Locus E, Surface	Totals
	Surface	TU-1	HP-2			
Desert Side-notched	1	–	–	1	1	3
Cottonwood	2	–	1	2	6	11
Rose Spring	–	1	–	–	2	3
Elko	–	–	–	2	–	2
Gypsum	–	–	–	1	–	1
Totals	3	1	1	6	9	20

of which came from the house pits. Eight others were found at Locus B and 13 more at Locus E. Most of the cores are of cryptocrystalline material: chalcedony (n = 10); chert (n = 6); silicate (n = 6); jasper (n = 3); rhyolite (n = 3); and quartz (n = 1). No obsidian cores were found. Most of the debitage is either chalcedony or chert. There is one core made from historic green glass (see below).

Hammerstones

The collection contains only three hammerstones, none from Locus C. Two specimens were found on the surface of Locus B (Cat. No.877, quartz, 80 x 70 mm; Cat. No. 919, rhyolite, 51 x 34 mm), and one was from the surface of Square C, Locus E (Cat. No. 662, basalt, 11.3 x 10.9 x 6.1 mm, 768.3 g). This paucity of hammerstones is unusual since lithic reduction seems to have been an important activity at KER-229.

Edge-Modified Flakes

Of the 149 edge-modified flakes (Table 10) collected, 56 were from Locus C, 58 from the surface of Locus B, 28 from the surface of Locus E, and seven with no provenience. Of the 56 specimens from Locus C, 22 were found on the surface, five from HP-1, 21 from HP-2, and eight from TU-1. By material, obsidian dominates with 52 (34.8 percent), followed by chalcedony (42; 28.8 percent), rhyolite (17; 11.4 percent), silicate (15; 9.9 percent), chert (12; 8.0 percent), jasper (7; 4.6 percent), quartz (2; 1.3 percent), basalt (1; 0.6 percent), and andesite (1; 0.6 percent). Twenty-two (42.3 percent) of the 52 obsidian specimens came from Locus C.

The edges of stone tools and flakes can be modified in a number of ways—by use such as cutting, or by natural means, such as trampling. Thus, in the absence of formal use wear studies (and none was conducted on the KER-229 materials), caution in interpretation is warranted. Nevertheless, the relative abundance of edge-modified flakes within HP-2 suggests that activities involving some usage of flakes were important. The relatively large number of obsidian specimens suggests that very sharp flakes were required for the tasks at hand.

Debitage

A total of 12,919 pieces of debitage were collected from the site (Table 11), and they were recorded only by number and material. Chalcedony and chert comprise 79.7 percent of the total while obsidian accounts for 12.6 percent. Rhyolite makes up 5.8 percent, and the remainder of the stone types occur in very low frequencies. Most of the debitage came from Locus B, followed by Loci E and C, however, most (58.2 percent) of the obsidian debitage came Locus C.

Table 7. Provenience and Attributes[a] of Bifaces from CA-KER-229.

Cat. No.	Provenience	Material	Length	Width	Thick	Weight	Comments
Complete							
635	Locus E, Square C, scrape	silicate	54.1	25.5	8.2	12.65	
954	Locus B, surf	rhyolite	45.0	15.0	–	–	
821	unknown	obsidian	21.3	8.8	5.2	2.90	missing
Fragments							
758	Locus C, surf	chalcedony	31.6	25.2	8.8	6.15	base
149	Locus C, TU-1, 10-20	silicate	33.0	30.0	–	–	base
883	Locus B, surf	obsidian	24.0	17.0	5.0	–	
900	Locus B, surf	chalcedony	22.0	21.0	11.0	–	
902	Locus B, surf	chalcedony	42.0	30.0	7.0	–	midsection
906	Locus B, surf	rhyolite	32.0	25.0	12.0	–	
915	Locus B, surf	chalcedony	230.	20.0	9.0	–	
916	Locus B, surf	chalcedony	35.0	20.0	11.0	–	
917	Locus B, surf	chert	44.0	32.0	14.0	–	
924	Locus B, surf	chert	35.0	20.0	9.0	–	
939	Locus B, surf	chert	35.0	31.0	–	–	tip
940	Locus B, surf	silicate	23.0	20.0	–	–	tip
941	Locus B, surf	silicate	25.0	18.0	–	–	midsection
942	Locus B, surf	silicate	42.0	31.0	–	–	base
993	Locus E, surf	obsidian	20.0	8.0	1.0	–	
999	Locus E, surf	chalcedony	30.0	21.0	10.0	–	
1036	Locus E, surf	obsidian	19.0	11.0	7.0	–	
1037	Locus E, surf	chert	25.0	17.0	–	–	
1038	Locus E, surf	jasper	28.0	26.0	–	–	
978	Locus E, Square C, scrape	–	36.0	–	–	–	tip
1004	Locus E, Square C, scrape	silicate	35.0	13.0	3.0	–	base
1063	Locus E, Square C, scrape	rhyolite	29.0	11.0	5.0	–	
1064	Locus E, Square C, scrape	rhyolite	29.0	26.0	9.0	–	
798	unknown	obsidian	18.1	16.2	16.5	1.90	distal, missing
815	unknown	obsidian	7.0	3.5	3.1	1.90	distal
816	unknown	obsidian	7.9	3.2	2.5	1.31	distal
823	unknown	obsidian	15.5	14.0	3.4	2.85	distal, missing

a. Metrics in millimeters and grams.

Table 8. Provenience and Attributes[a] of Scrapers from CA-KER-229.

Cat. No.	Provenience	Material	Length	Width	Thick	Weight
901	Locus B, surf	chalcedony	35.0	25.0	13.0	–
932	Locus B, surf	rhyolite	33.0	31.0	12.0	–
947	Locus B, surf	chalcedony	35.0	30.0	13.0	–
957	Locus B, surf	chalcedony	43.0	30.0	7.0	–
958	Locus B, surf	rhyolite	38.0	33.0	10.0	–
009	Locus C, surf	chalcedony	55.0	35.0	22.0	–
010	Locus C, surf	jasper	46.0	45.0	25.0	–
011	Locus C, surf	chalcedony	34.0	28.0	–	–
1041	Locus E, surf	silicate	22.0	20.0	–	–
1045	Locus E, surf	silicate	42.0	34.0	18.0	–
1046	Locus E, surf	silicate	60.0	40.0	–	–
1029	Locus E, Square B, scrape	rhyolite	55.0	34.0	25.0	–
1005	Locus E, Square C, scrape	silicate	28.0	–	–	–

a. Metrics in millimeters and grams.

Debitage recovered from Locus C was classified into five basic flake types (Table 12). The vast majority of the Locus C debitage reflects tool rejuvenation rather than manufacture, as seen by the virtual absence of primary flakes. This is particularly true of the obsidian debitage. The source of the chalcedony and chert materials is unknown, but there are outcroppings of those materials in the vicinity of Sand Canyon.

The debitage observed on the surface in 2005 (none was collected or included in the 12,919 count above) was quantified by 20-m grid square. The densities of cryptocrystalline debitage (N = 3,442) across the site are shown in Figure 11, and the density of obsidian debitage (N = 423) is shown in Figure 12. These data show that the highest concentration of debitage was in the eastern portion of the site, in Loci B and E. A number of finished artifacts was also observed and mapped across the site (Figure 13).

Bone Artifacts

Two artifacts of unidentified bone were recovered. The midsection of what appears to be an awl (Cat. No. 562) was found on the surface of Locus B; it measures 20.5 x 4.1 x 4.3 mm and weighs 0.35 g. One-half of a bone bead (Cat. No. 679), found on the surface of Locus E, measures 12.2 x 7.4 x 3.5 mm, weighs 0.25 g, and has a perforation diameter of 5.4 mm.

Pottery

Seventy pottery sherds were found at the site (Table 13)—43 at Locus C, 15 at Locus B, and 12 at Locus E. All the pottery is a brownware (e.g., Tizon Brown) typical of the area. None of the specimens were decorated, their variety of colors attributed to discoloration that occurred during firing. Most (n = 66) of the fragments are body sherds, but four very small rim sherds are present, two from Locus C and one each from Loci B and E. Each of the three rim specimens present in the collection is rounded and represents a vessel with a

Table 9. Provenience and Attributes[a] of Cores from CA-KER-229.

Cat. No.	Provenience	Material	Length	Width	Thick	Weight	Comments
927	Locus B, Square A	chalcedony	50.0	30.0	25.0	–	
905	Locus B, surf	chalcedony	43.0	20.0	18.0	–	
913	Locus B, surf	chert	49.0	45.0	38.0	–	burned
933	Locus B, surf	silicate	70.0	50.0	–	–	
944	Locus B, surf	silicate	32.0	30.0	–	–	
945	Locus B, surf	silicate	40.0	30.0	–	–	
946	Locus B, surf	silicate	38.0	30.0	–	–	
953	Locus B, surf	chalcedony	35.0	24.0	16.0	–	
052	Locus C, HP-1, 4/4, surface	jasper	24.7	23.5	12.3	6.52	
485	Locus C, HP-2, GA-5, surf	chert	60.4	30.6	20.2	30.4	
486	Locus C, HP-2, GA-5, surf	chert	32.4	28.7	14.7	12.7	
235	Locus C, HP-2, GA-1, scrape	silicate	50.0	30.0	–	–	
236	Locus C, HP-2, GA-1, scrape	rhyolite	70.0	60.0	–	–	
257	Locus C, HP-2, GA-2, scrape	chalcedony	41.9	27.4	31.9	50.9	
378	Locus C, HP-2, GA-9, scrape	jasper	22.1	18.8	16.9	51.9	
471	Locus C, surf	chert	90.0	60.0	35.0	–	possible scraper
754	Locus E, surf	chert	64.1	58.4	21.8	72.1	
755	Locus E, surf	jasper	70.9	51.7	29.9	107.7	
756	Locus E, surf	chalcedony	67.6	56.6	26.5	86.5	unifacial
757	Locus E, surf	chalcedony	57.1	54.8	32.2	88.4	
989	Locus E, surf	chalcedony	75.0	64.0	20.0	–	
992	Locus E, surf	rhyolite	70.0	63.0	30.0	–	
995	Locus E, surf	quartz	56.0	48.0	–	–	
1051	Locus E, surf	silicate	73.0	53.0	50.0	–	
1030	Locus E, Square B, scrape	chalcedony	90.0	59.0	22.0	–	
1031	Locus E, Square B, scrape	chalcedony	57.0	45.0	31.0	–	
1032	Locus E, Square B, scrape	chalcedony	28.0	25.0	11.0	–	
1034	Locus E, Square B, scrape	chert	35.0	20.0	–	–	
1035	Locus E, Square B, scrape	rhyolite	52.0	35.0	10.0	–	

a. Metrics in millimeters and grams.

Table 10. Provenience and Attributes[a] of Edge-Modified Flakes from CA-KER-229.

Cat. No.	Provenience	Material	Length	Width	Thickness	Weight
795	unknown	obsidian	12.5	3.0	1.8	1.70
796	unknown	obsidian	8.3	6.5	4.9	2.34
797	unknown	obsidian	12.0	5.7	9.5	1.93
804	unknown	obsidian	11.0	5.5	3.6	1.64
805	unknown	obsidian	12.8	8.0	2.5	2.95
806	unknown	obsidian	21.8	4.8	22.5	2.75
808	unknown	obsidian	12.5	3.0	1.8	1.70
580	Locus B, surf	chert	30.0	24.2	6.9	4.9
855	Locus B, surf	chalcedony	26.0	25.0	–	–
857	Locus B, surf	jasper	24.0	20.0	–	–
858	Locus B, surf	jasper	45.0	25.0	–	–
859	Locus B, surf	obsidian	50.0	35.0	–	–
860	Locus B, surf	chalcedony	22.0	15.0	–	–
861	Locus B, surf	chalcedony	76.0	40.0	–	–
862	Locus B, surf	chalcedony	68.0	40.0	–	–
863	Locus B, surf	chalcedony	50.0	40.0	–	–
864	Locus B, surf	chalcedony	45.0	30.0	–	–
865	Locus B, surf	chalcedony	58.0	30.0	–	–
866	Locus B, surf	chalcedony	51.0	31.0	–	–
867	Locus B, surf	chalcedony	30.0	20.0	–	–
868	Locus B, surf	chalcedony	55.0	25.0	–	–
869	Locus B, surf	chalcedony	45.0	30.0	–	–
870	Locus B, surf	chalcedony	65.0	55.0	–	–
871	Locus B, surf	rhyolite	50.0	35.0	–	–
872	Locus B, surf	rhyolite	50.0	35.0	–	–
873	Locus B, surf	jasper	21.0	20.0	–	–
874	Locus B, surf	quartz	33.0	12.0	–	–
875	Locus B, surf	jasper	20.0	12.0	–	–
876	Locus B, surf	jasper	20.0	16.0	–	–
878	Locus B, surf	obsidian	15.0	9.0	–	–
879	Locus B, surf	obsidian	21.0	18.0	7.0	–
881	Locus B, surf	obsidian	20.0	11.0	–	–
884	Locus B, surf	obsidian	24.0	13.0	–	–
885	Locus B, surf	obsidian	37.0	11.0	–	–
897	Locus B, surf	chalcedony	25.0	18.0	5.0	–
898	Locus B, surf	obsidian	19.0	17.0	4.0	–
899	Locus B, surf	obsidian	11.0	10.0	4.0	–
903	Locus B, surf	chalcedony	27.0	17.0	8.0	–
904	Locus B, surf	chalcedony	71.0	37.0	13.0	–
907	Locus B, surf	chalcedony	41.0	21.0	4.0	–
908	Locus B, surf	chalcedony	48.0	30.0	20.0	–
909	Locus B, surf	chalcedony	51.0	35.0	14.0	–

Table 10. *(continued)*

Cat. No.	Provenience	Material	Length	Width	Thickness	Weight
910	Locus B, surf	chalcedony	35.0	24.0	9.0	–
911	Locus B, surf	chalcedony	33.0	27.0	5.0	–
912	Locus B, surf	chalcedony	20.0	18.0	7.0	–
914	Locus B, surf	basalt	22.0	12.0	3.0	–
918	Locus B, surf	rhyolite	30.0	30.0	14.0	–
920	Locus B, surf	rhyolite	40.0	25.0	11.0	–
921	Locus B, surf	rhyolite	30.0	–	5.0	–
922	Locus B, surf	jasper	38.0	30.0	8.0	–
923	Locus B, surf	chalcedony	37.0	35.0	14.0	–
938	Locus B, surf	chalcedony	60.0	45.0	–	–
943	Locus B, surf	chalcedony	42.0	35.0	–	–
948	Locus B, surf	chert	30.0	17.0	5.0	–
949	Locus B, surf	chalcedony	30.0	17.0	10.0	–
950	Locus B, surf	chalcedony	31.0	18.0	17.0	–
951	Locus B, surf	chalcedony	26.0	22.0	8.0	–
952	Locus B, surf	chalcedony	36.0	22.0	12.0	–
955	Locus B, surf	obsidian	23.0	20.0	9.0	–
956	Locus B, surf	chert	37.0	24.0	18.0	–
959	Locus B, surf	obsidian	17.0	14.0	5.0	–
960	Locus B, surf	obsidian	30.0	27.0	7.0	–
962	Locus B, surf	silicate	33.0	20.0	–	–
963	Locus B, surf	rhyolite	37.0	28.0	–	–
966	Locus B, surf	rhyolite	40.0	35.0	16.0	–
012	Locus C, surf	obsidian	20.1	14.9	48.1	1.13
013	Locus C, surf	obsidian	22.0	19.0	–	–
024	Locus C, surf	silicate	20.0	13.0	6.0	–
040	Locus C, surf	obsidian	18.0	15.0	–	–
041	Locus C, surf	obsidian	22.0	18.0	–	–
042	Locus C, surf	silicate	29.0	16.0	7.0	–
043	Locus C, surf	silicate	18.0	16.0	6.5	–
195	Locus C, surf	silicate	45.0	–	–	–
196	Locus C, surf	rhyolite	46.0	25.0	–	–
463	Locus C, surf	chert	–	–	–	–
464	Locus C, surf	chalcedony	27.0	17.0	5.0	–
465	Locus C, surf	rhyolite	33.0	28.0	10.0	–
466	Locus C, surf	rhyolite	33.0	26.0	6.0	–
469	Locus C, surf	obsidian	20.0	17.0	5.0	–
470	Locus C, surf	obsidian	25.0	11.0	3.0	–
472	Locus C, surf	chalcedony	60.0	49.0	15.0	–
473	Locus C, surf	chalcedony	50.0	43.0	23.0	–
474	Locus C, surf	chert	70.0	41.0	20.0	–

a. Metrics in millimeters and grams.

Table 11. Debitage by Locus and Material, CA-KER-229.

Material	Locus C	Locus B	Locus E	Unknown	Total	Percent of Total
andesite	6	–	–	–	6	0.1
basalt	2	4	3	–	9	0.1
chalcedony	1,456	2,817	2,702	–	6,975	53.1
chert	752	1,452	1,218	1	3,423	26.6
jasper	8	1	–	–	9	0.1
obsidian	953	225	408	23	1,609	12.6
quartzite	1	–	–	–	1	0.1
rhyolite	64	308	359	–	731	5.8
sandstone	7	44	52	–	103	0.9
silicate	51	2	–	–	53	0.6
Totals	3,300	4,853	4,742	24	12,919	100

Table 12. Debitage by Flake Type and Material, Locus C, CA-KER-229.

Material/Flake Type	Primary	Secondary	Biface-Thinning	Tertiary	Shatter	Totals
andesite	–	1	–	2	3	6
basalt	–	1	–	–	1	2
chalcedony	4	167	173	803	309	1,456
chert	–	66	63	469	154	752
jasper	–	6	–	–	2	8
obsidian	–	28	55	826	44	953
quartzite	–	1	–	–	–	1
rhyolite	–	19	2	18	25	64
sandstone	–	1	–	–	6	7
silicate	–	9	5	27	10	51
Totals	4	299	298	2,145	554	3,300

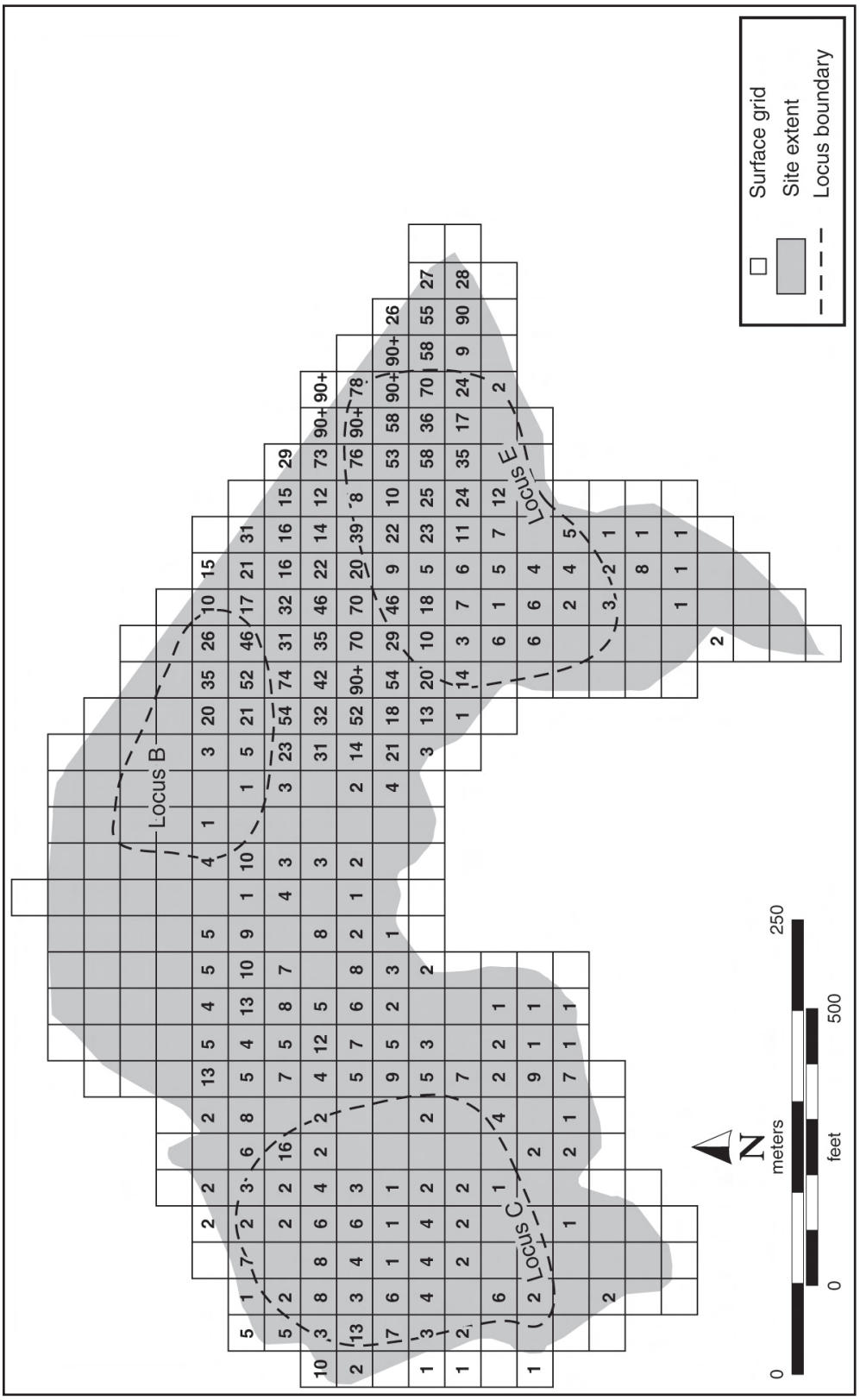

Figure 11. Distribution of surface-observed cryptocrystalline debitage across CA-KER-229 as quantified by grid unit.

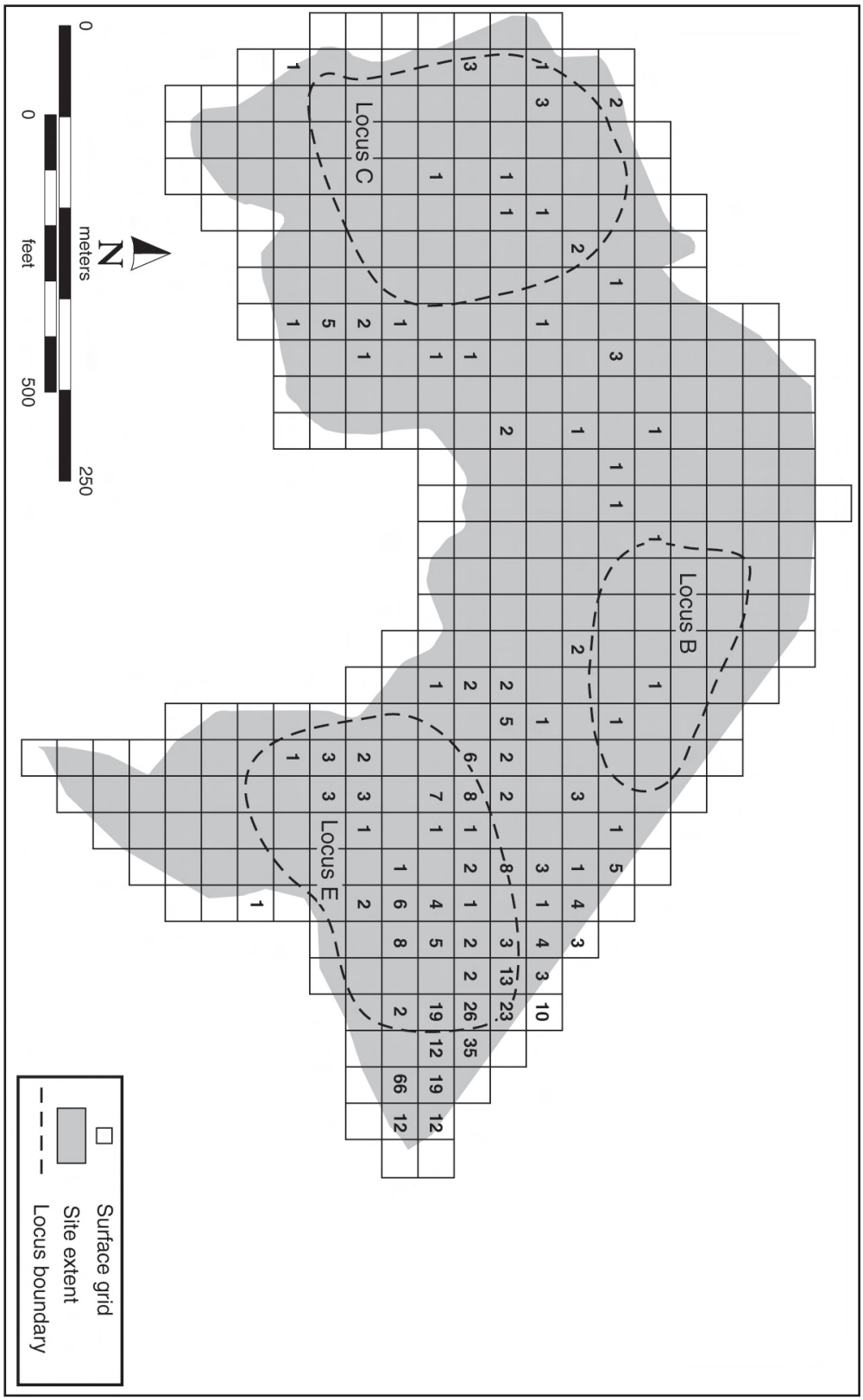

Figure 12. Distribution of surface-observed obsidian debitage across CA-KER-229 as quantified by grid unit.

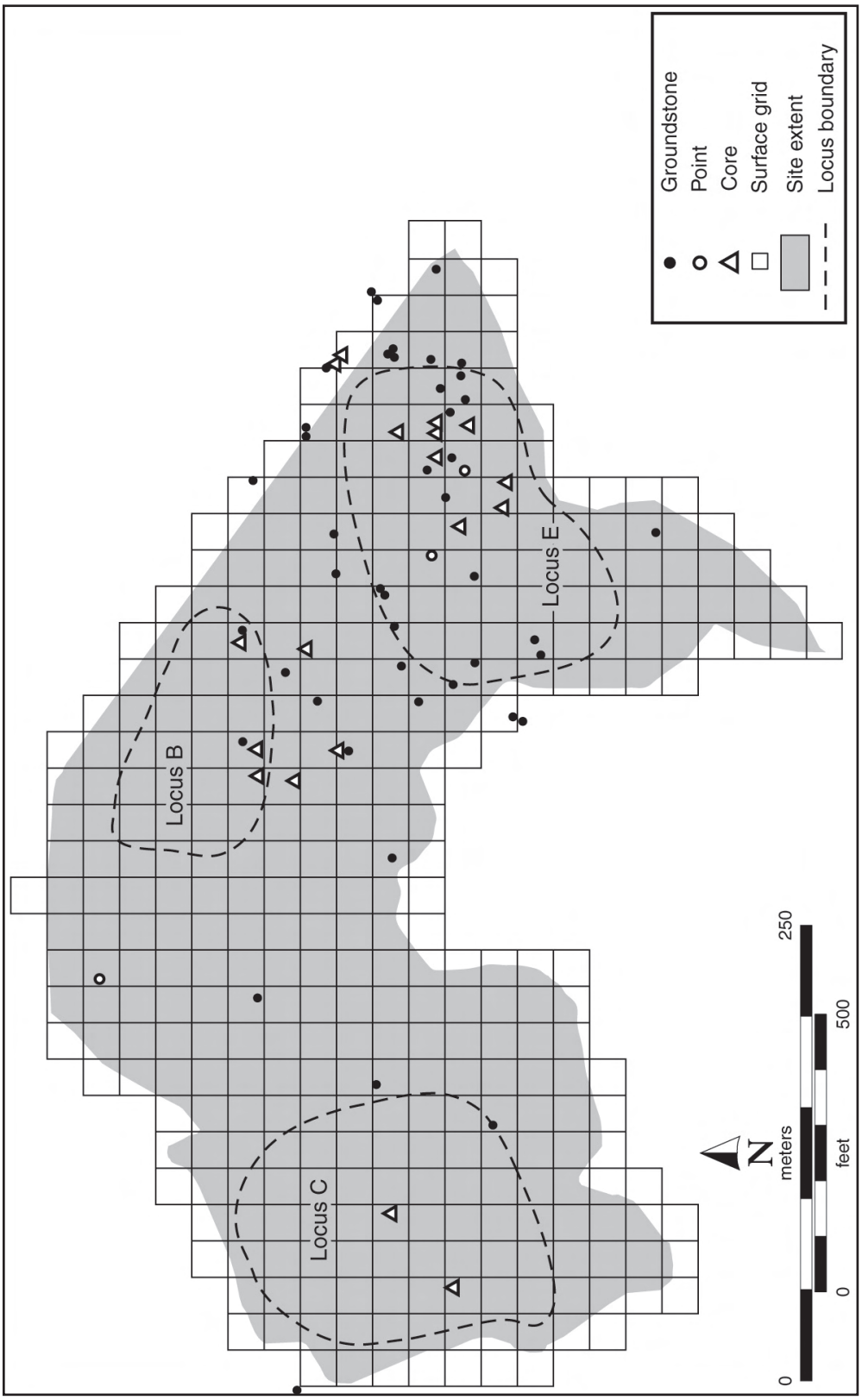

Figure 13. Distribution of surface-observed artifacts across CA-KER-229 as quantified by grid unit.

Table 13. The Distribution of Pottery at CA-KER-229.

Provenience/ Type	Body	Rim	Totals
Locus B			
surface	14	1	15
Locus B Subtotal		<15>	
Locus C			
surface	1	–	1
TU-1, 10-20	5	–	5
TU-1, 20-30	14	2	16
TU-1, 30-40	5	–	5
HP-2, GA-1, surface	2	–	2
HP-2, GA-3, surface	2	–	2
HP-2, GA-5, surface	5	–	5
HP-2, GA-6, surface	1	–	1
HP-2, GA-7, surface	1	–	1
HP-2, GA-11, surface	1	–	1
HP-2, GA-12, surface	1	–	1
unknown	3	–	3
Locus C Subtotal		<43>	
Locus E			
surface	8	1	9
Square C, Surface	3	–	3
Locus E Subtotal		<12>	
Grand Totals	66	4	70

wide opening, probably a bowl. Zigmond (1986:401) noted that, "In all likelihood pottery-making was never an important industry [among the Kawaiisu] . …Pottery may have been traded in, rather than made locally, for example, Owens Valley Brownware." Currently, there is no evidence that pottery was manufactured at the site.

Shell Artifacts

Eighty-eight shell beads were recovered, 80 of *Olivella* and seven of clam (cf., *Tivela stultorum*). Two other small pieces of shell were also recovered.

Olivella Beads

Eighty *Olivella* (cf., *biplicata)* beads were recovered (Table 14). Seven bead types were identified, each of which is discussed below. Twenty-three specimens could not be classified to type.

One spire-lopped bead (Class A1a, small spire-lopped) (Bennyhoff and Hughes 1987:118) was found. This type has no firm temporal significance, although it is more common in the Late Period (Bennyhoff and Hughes 1987:117). The virtual absence of this bead type at KER-229 is curious.

Table 14. Provenience and Attributes[a] of Shell Beads from CA-KER-229.

Cat. No.	Provenience	Type and Class[b]	Dia.	Thick.	Perforation Dia.	Weight	Comments
508	Locus B, surf	*Olivella*, A1b	7.8	–	–	0.5	12.4 long
509	Locus B, surf	*Olivella*, H3	7.6	0.8	0.6	0.1	
510	Locus B, surf	*Olivella*, H1b	6.7	1.0	0.4	0.1	
511	Locus B, surf	*Olivella*, H2	6.1	0.6	0.9	0.1	
512	Locus B, surf	*Olivella*, H1b	5.4	0.2	0.9	0.1	
549	Locus B, Square A	*Olivella*, H1a	6.0	2.0	0.8	0.05	
576	Locus B, surf	*Olivella*, H3	8.7	2.0	1.0	0.05	
577	Locus B, surf	*Olivella*, H3	7.0	1.4	0.7	0.05	
578	Locus B, surf	clam, cf. *Tivela stultorum*	4.8	1.1	0.8	0.05	
937	Locus B, surf	*Olivella*, unclassified	7.0	0.6	–	–	
130	Locus C, TU-1, 10-20	*Olivella*, H1b	6.8	0.9	–	0.08	
159	Locus C, TU-1, 10-20	*Olivella*, H1a	5.7	0.6	–	0.02	
160	Locus C, TU-1, 10-20	*Olivella*, H1b	7.0	0.9	–	0.02	fragment
233	Locus C, HP-2, GA-1, scrape	*Olivella*, G1	3.3	0.5	1.8	0.01	
276	Locus C, TU-1, 30-40	*Olivella*, H1b	7.4	0.8	1.3	0.06	
296	Locus C, TU-1, 20-30	*Olivella*, H3	7.7	1.7	1.1	0.09	
297	Locus C, TU-1, 20-30	*Olivella*, H3	7.7	1.7	1.1	0.09	
298	Locus C, TU-1, 20-30	*Olivella*, H1a	–	–	–	0.04	fragment
299	Locus C, TU-1, 20-30	*Olivella*, unclassified	5.6	1.2	–	0.05	fragment
268	Locus C, TU-1, 40-bedrock	*Olivella*, G1	4.0	0.9	1.3	–	
343	Locus C, HP-2, GA-11, scrape	*Olivella*, unclassified	5.6	3.7	–	0.04	
360	Locus C, HP-2, GA-12, scrape	*Olivella*, G1	4.0	–	1.8	0.01	
382	Locus C, HP-2, GA-9, scrape	*Olivella*, G1	3.8	–	0.6	0.01	
624	Locus E, Square B, scrape	*Olivella*, G1	3.8	0.8	1.6	0.05	
625	Locus E, Square B, scrape	clam, cf. *Tivela stultorum*	4.5	1.3	1.7	0.05	
626	Locus E, Square B, scrape	*Olivella*, H1b	3.9	0.9	1.3	0.05	
627	Locus E, Square B, scrape	*Olivella*, H2	3.5	0.9	0.8	0.05	
628	Locus E, Square B, scrape	*Olivella*, H1a	3.5	0.7	1.5	0.05	
630	Locus E, Square C, scrape	clam, cf. *Tivela stultorum*	4.0	7.5	1.9	0.15	cylindrical
632	Locus E, Square C, scrape	*Olivella*, G1	4.5	1.3	1.2	0.05	
633	Locus E, Square C, scrape	*Olivella*, G1	3.7	0.9	1.7	0.05	
634	Locus E, Square C, scrape	*Olivella*, H1a	3.6	1.0	1.4	0.05	
638	Locus E, Square C, scrape	clam, cf. *Tivela stultorum*	6.8	2.2	0.7	0.05	
639	Locus E, Square B, scrape	*Olivella*, H2	4.2	0.8	1.0	0.05	
640	Locus E, Square B, scrape	*Olivella*, K1	3.2	1.9	1.4	0.05	
641	Locus E, Square B, scrape	*Olivella*, G1	3.4	0.9	1.3	0.05	
651	Locus E, Square C, scrape	unidentified	4.8	–	1.9	0.05	in 3 pieces
686	Locus E, outside Square B, surf	clam, cf. *Tivela stultorum*	6.3	2.7	1.6	0.15	
687	Locus E, outside Square B, surf	*Olivella*, H1b	4.8	1.2	1.4	0.05	
688	Locus E, outside Square B, surf	*Olivella*, G1	3.6	0.7	1.4	0.05	
763	Locus E, Square C, scrape	clam, cf. *Tivela stultorum*	4.6	1.3	0.9	0.05	
764	Locus E, Square C, scrape	clam, cf. *Tivela stultorum*	4.6	1.2	1.0	0.05	
765	Locus E, Square C, scrape	*Olivella*, H1b	5.2	1.3	0.8	0.05	
766	Locus E, Square C, scrape	*Olivella*, H1a	4.2	1.3	1.1	0.05	
767	Locus E, Square C, scrape	*Olivella*, H1a	5.0	1.2	0.9	0.05	

Table 14. *(continued)*

Cat. No.	Provenience	Type and Class[b]	Dia.	Thick.	Perforation Dia.	Weight	Comments
768	Locus E, Square C, scrape	*Olivella*, H1b	4.9	1.3	0.8	0.05	
769	Locus E, Square C, scrape	*Olivella*, H1b	4.6	1.3	0.9	0.05	
770	Locus E, Square C, scrape	*Olivella*, H1b	4.3	1.2	1.0	0.05	
771	Locus E, Square C, scrape	*Olivella*, H1a	4.6	1.1	1.0	0.05	
772	Locus E, Square C, scrape	*Olivella*, K1	4.1	1.3	1.3	0.05	
773	Locus E, Square C, scrape	*Olivella*, H1a	4.6	1.2	0.9	0.05	
774	Locus E, Square C, scrape	*Olivella*, H1a	4.3	1.2	0.9	0.05	
775	Locus E, Square C, scrape	*Olivella*, G1	4.1	1.0	1.2	0.05	
776	Locus E, Square C, scrape	*Olivella*, H1a	4.0	1.0	0.9	0.05	
777	Locus E, Square C, scrape	*Olivella*, K1	3.7	1.5	1.1	0.05	
778	Locus E, Square C, scrape	*Olivella*, G1	4.0	0.9	1.2	0.05	
779	Locus E, Square C, scrape	*Olivella*, H1a	4.2	1.0	1.0	0.05	
780	Locus E, Square C, scrape	*Olivella*, H1a	4.4	1.3	0.9	0.05	
781	Locus E, Square C, scrape	*Olivella*, H1b	4.0	1.1	1.0	0.05	
782	Locus E, Square C, scrape	*Olivella*, H1a	4.2	1.3	1.4	0.05	
783	Locus E, Square C, scrape	*Olivella*, H1a	4.2	1.2	1.0	0.05	
784	Locus E, Square C, scrape	*Olivella*, H1b	4.3	1.2	0.8	0.05	
785	Locus E, Square C, scrape	*Olivella*, H1a	4.1	1.0	1.4	0.05	
786	Locus E, Square C, scrape	*Olivella*, G1	3.9	1.1	1.0	0.05	
787	Locus E, Square C, scrape	*Olivella*, H1a	4.0	1.0	1.0	0.05	
788	Locus E, Square C, scrape	*Olivella*, H1b	3.7	1.0	0.8	0.05	
789	Locus E, Square C, scrape	*Olivella*, H1b	4.2	1.1	1.0	0.05	
790	Locus E, Square C, scrape	*Olivella*, H1a	4.0	1.1	1.0	0.05	
1006	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1007	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1008	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1009	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1010	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1011	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1012	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1013	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1014	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1015	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1016	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1017	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1018	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1019	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1020	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1021	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1022	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1023	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1024	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	
1025	Locus E, Square C, scrape	*Olivella*, unclassified	–	–	–	–	

a. Metrics in millimeters and grams.
b. Following Bennyhoff and Hughes (1987); all *Olivella* beads are *O. biplicata.*

Twelve Class G1 saucer beads were found, four in Locus C and eight in Locus E. This type lacks temporal significance (Bennyhoff and Hughes 1987:132).

Forty-one *Olivella* Class H disk beads (Bennyhoff and Hughes 1987:135) were recovered. Four types of Class H beads are present. Most are H1a ground disks (n = 18); others are H1b semi-ground disks (n = 15), H2 rough disks (n = 3), and H3 chipped disks (n = 5). They were perforated using metal needles. Class H beads occur primarily in southern California and date to the Late Mission Period, about A.D. 1800-1816.

Three K1 cupped beads (Bennyhoff and Hughes 1987:137) were found, all at Locus E. These beads probably date to the Late Prehistoric Period, after ca. A.D. 1200.

Most of the *Olivella* beads (58; 72.5 percent) came from Locus E, with 13 (16.2 percent) from Locus C and nine (11.3 percent) from Locus B (Table 15). Of the specimens from Locus E, 52 (96.5 percent) were recovered from the surface scrape of Square C. The small quantity of beads (n = 13) recovered at Locus C, coupled with the presence of most of the glass beads, may suggest that shell beads were not as economically significant after contact as they had previously been.

Clam Beads

Only seven clam (*Tivela stultorum*) beads (Table 14) were discovered, one at Locus B, six at Locus E, and none at Locus C. Clam beads may date a bit earlier than the occupation at Locus C, as suggested by the predominance of glass beads at Locus C.

Other Shell Artifacts

The collection contains two other shell artifacts. A small fragment of *Haliotis* shell (Cat. No. 259) was found in association with HP-2 (Unit GA-2) in Locus C. The piece measures 7.3 x 3.0 x 0.6 mm and weighs 0.2 g, but its function is unknown. Second, a small piece of unidentified shell (Cat. No. 423) was found in association with HP-2 (Unit GA-5) in Locus C. The fragment measures 20.7 x 15.9 x 6.6 mm and weighs 3.55 g. It exhibits a small groove and was perhaps used as a sharpener.

Glass Beads

A total of 89 glass beads were found at the site (see Table 16) and were classified (following Gibson 1976), although 33 could not be classified to type. The 56 classified specimens fall into seven basic types. The most common type (n = 23) is the F1 blue, short cane, hexagonal, plain ground faceted bead, one of the most widely distributed trade beads in the United States. The second most common type is C6, the "Cornaline d'Aleppo" bead, with two variants. The C6a bead is red with a green center, and the C6b bead is red with a white center, sometimes referred to as the "White Heart." Both variants were traded between about A.D. 1600 and 1800 and are found in high frequency in southern California (Woodward 1965). The other five types occurred in low frequencies (Table 16).

The distribution of the glass beads (Table 17) is interesting, with 86 (96.6 percent) being found at Locus C. Within Locus C, 47 were found on the surface (41 associated with HP-2) and 39 in the excavation units. The virtual absence of glass beads in other parts of the site suggests that those areas were little used after contact.

Additional Historic Artifacts

A relatively small number of other historic artifacts were recovered from across the site, consisting mostly of glass (bottle and window pane) fragments, shell casings, percussion caps, lead bullets, shell buttons, pieces of wire, square nails, unidentified metal fragments, and one tobacco can lid. A few historic artifacts

Table 15. Shell Beads by Provenience and Type, CA-KER-229.

Provenience	*Olivella*[a]								Clam	Unidentified	Totals
	A1b	G1	H1a	H1b	H2	H3	K1	unclassified			
Locus C											
surface	–	–	–	–	–	–	–	–	–	–	0
HP-2	–	3	–	–	–	–	–	1	–	–	4
Locus B											
surface	1	–	–	2	1	3	–	1	1	–	9
Locus E											
surface	–	1	–	1	–	–	–	–	1	–	3
Square B	–	1	1	1	1	–	–	–	1	–	5
Square C	–	6	14	8	1	–	3	20	3	1	56
Totals	1	12	18	15	3	5	3	23	6	1	87

a. Typed following Bennyhoff and Hughes (1987).

were recovered as deep as 40 cm in the excavation units in Locus C, perhaps due to bioturbation of the deposit and/or to the circumstance that most of the deposit dates very late.

Of interest is the presence of eight pieces of historic glass at Locus C that appear to have been worked (Table 18). These include a "core," two worked "flakes," a fragment that was melted in a fire, and four apparent flakes. The presence of these pieces supports the idea of a very late occupation of Locus C.

Faunal Remains

A relatively large number of faunal remains were recovered, primarily from Locus C. These are mostly from vertebrates, but a few fragments of shell were also found.

Invertebrate Remains

Only four very small fragments of nonartifactual shell were recovered. At Locus C a fragment of shell (Cat. No. 487) was found in HP-2, Unit GA-7. A mussel hinge fragment (Cat. No. 608) was found on the surface of Locus B. Lastly, two pieces of freshwater mussel (Cat. Nos. 699 and 734) came from the surface of Square B at Locus E. It is not clear what these pieces represent.

Vertebrate Remains

Vertebrate faunal materials collected from KER-229 consist of 5,739 specimens (NISP) weighing 523.74 grams. The majority of these remains was recovered from Locus C (n = 4,329; 352.49 g), with 277 specimens (25.8 g) from Locus B, and 1,133 specimens (145.45 g) from Locus E. Most of the sample represents small mammals, likely rabbits and hares (lagomorphs) and rodents, but large mammals, birds, and reptiles are also present. A significant percentage of the faunal remains are burned.

An analysis of the faunal materials recovered from TU-1 and HP-2 in Locus C was undertaken to compare the results from the general midden deposit (TU-1) to the excavated structure. This analysis was conducted utilizing the comparative collection at CSUB.

Table 16. Provenience and Attributes of Glass Beads from CA-KER-229.

Cat. No.	Provenience[a]	Type[b]	Comments
500	Locus B, surface	C4, opaque white-on-white	
141	Locus C, surface	F1	near HP-4, complete
186	Locus C, surface	F1	near HP-2, fragment
187	Locus C, surface	F1, blue	near HP-2, complete
188	Locus C, surface	C6, red with white center	near HP-2, complete
190	Locus C, surface	F1, blue	near HP-2, complete
194	Locus C, surface	unclassified, blue	near HP-4, complete
852	Locus C, TU-1, 0-10	F1	complete
853	Locus C, TU-1, 0-10	F6	fragment
854	Locus C, TU-1, 0-10	C1, white	fragment
133	Locus C, TU-1, 10-20	F1	complete
135	Locus C, TU-1, 10-20	F1, blue	complete
136	Locus C, TU-1, 10-20	C6, red, round	complete
164a	Locus C, TU-1, 10-20	unclassified, yellow	complete
164b	Locus C, TU-1, 10-20	unclassified, green	complete
164c	Locus C, TU-1, 10-20	unclassified, blue	complete
844	Locus C, TU-1, 10-20	C6b, red with white center	complete
845	Locus C, TU-1, 10-20	C6a, red with green center	complete
846	Locus C, TU-1, 10-20	C1a, light blue	complete
848	Locus C, TU-1, 10-20	C3a, green barrel	complete
849	Locus C, TU-1, 10-20	C2, copper barrel	complete
850	Locus C, TU-1, 10-20	C1a, light blue	complete
134	Locus C, TU-1, 10-20	F1	fragment
164	Locus C, TU-1, 10-20	C6b, red with white center	fragment
847	Locus C, TU-1, 10-20	C1, aqua	fragment
293	Locus C, TU-1, 20-30	C1, light blue	complete
835	Locus C, TU-1, 20-30	C6b, red with white center	complete
836	Locus C, TU-1, 20-30	C6b, red with white center	complete
834	Locus C, TU-1, 20-30	F1	complete
277	Locus C, TU-1, 30-40	F1, blue/green	complete
277a	Locus C, TU-1, 30-40	F1, green-blue	–
277b	Locus C, TU-1, 30-40	F1, green-blue	–
277c	Locus C, TU-1, 30-40	F1, green-blue	–
277d	Locus C, TU-1, 30-40	F1, green-blue	–
277e	Locus C, TU-1, 30-40	unclassified, blue	–
277f	Locus C, TU-1, 30-40	unclassified, red	–
277g	Locus C, TU-1, 30-40	unclassified, red	–
277h	Locus C, TU-1, 30-40	unclassified, red	–
277i	Locus C, TU-1, 30-40	unclassified, red	–
277j	Locus C, TU-1, 30-40	unclassified, red	–
277k	Locus C, TU-1, 30-40	unclassified, red	–
277l	Locus C, TU-1, 30-40	unclassified, red	–
277m	Locus C, TU-1, 30-40	unclassified, red, cylinder	–
851	Locus C, HP-1, TU4/0, 10-20	C1, aqua	fragment

Table 16. *(continued)*

Cat. No.	Provenience[a]	Type[b]	Comments
171	Locus C, HP-1, TU4/0, 10-20	C1, dark blue	complete
234	Locus C, HP-2, GA-1, surface	C1, cobalt blue	complete
260	Locus C, HP-2, GA-2, surface	unclassified	5 complete specimens
232	Locus C, HP-2, GA-3, surface	C6b, red with white center	complete
245	Locus C, HP-2, GA-3, surface	unclassified, blue	complete
245a	Locus C, HP-2, GA-3, surface	unclassified, blue	complete
245b	Locus C, HP-2, GA-3, surface	unclassified, red	complete
245c	Locus C, HP-2, GA-3, surface	unclassified, red	complete
245d	Locus C, HP-2, GA-3, surface	C6b, red with white center	complete
245e	Locus C, HP-2, GA-3, surface	C6b, red with white center	complete
245f	Locus C, HP-2, GA-3, surface	C6b, red with white center	complete
214	Locus C, HP-2, GA-4, surface	F1, blue	complete
431	Locus C, HP-2, GA-5, surface	unclassified	complete
832	Locus C, HP-2, GA-5, surface	unclassified	fragment
830	Locus C, HP-2, GA-5, surface	unclassified	complete
831	Locus C, HP-2, GA-5, surface	unclassified	fragment
828	Locus C, HP-2, GA-5, surface	unclassified	fragment
829	Locus C, HP-2, GA-5, surface	unclassified	fragment
398	Locus C, HP-2, GA-6, surface	C6b, red with white center	–
827	Locus C, HP-2, GA-6, surface	C1, dark blue	complete
384	Locus C, HP-2, GA-7, surface	F1	complete
833	Locus C, HP-2, GA-7, surface	F1	fragment
449	Locus C, HP-2, GA-8, surface	F1	fragment
370	Locus C, HP-2, GA-9, surface	F1	fragment
443	Locus C, HP-2, GA-10, surface	C6b, red with white center	fragment
837	Locus C, HP-2, GA-10, surface	C6b, red with white center	fragment
838	Locus C, HP-2, GA-10, surface	C4, white	complete
840	Locus C, HP-2, GA-10, surface	C3, green	fragment
841	Locus C, HP-2, GA-10, surface	F1	fragment
842	Locus C, HP-2, GA-10, surface	F1	fragment
843	Locus C, HP-2, GA-10, surface	F1	fragment
839	Locus C, HP-2, GA-10, surface	C6a, red with green center	complete
344	Locus C, HP-2, GA-11, surface	C6b, red with white center	complete
359	Locus C, HP-2, GA-12, surface	unclassified, red	complete, “Spanish”
359a	Locus C, HP-2, GA-12, surface	unclassified, red	“Spanish”
359b	Locus C, HP-2, GA-12, surface	unclassified, blue	“Russian”
359c	Locus C, HP-2, GA-12, surface	unclassified, blue	“Russian”
359d	Locus C, HP-2, GA-12, surface	unclassified, blue	“Russian”
629	Locus E, Square B, surface	C1, light blue “seed bead”	–

a. In centimeters.
b. Classified following the typology of Gibson (1976).

Table 17. Number of Glass Beads by Type (following Gibson 1976) and Provenience.

Provenience/Type	C1	C2	C3	C4	C6	F1	F6	Unclassified	Totals
Locus B									
surface	–	–	–	1	–	–	–	–	1
Locus C									
surface	–	–	–	–	1	4	–	1	6
TU-1, 0-10	1	–	–	–	–	1	1	–	3
TU-1, 10-20	3	1	1	–	4	3	–	3	15
TU-1, 20-30	1	–	–	–	2	1	–	–	4
TU-1, 30-40	–	–	–	–	–	6	–	9	15
HP-1, TU4/0, 10-20	2	–	–	–	–	–	–	–	2
HP-2, GA-1, surface	1	–	–	–	–	–	–	–	1
HP-2, GA-2, surface	–	–	–	–	–	–	–	5	5
HP-2, GA-3, surface	–	–	–	–	4	–	–	4	8
HP-2, GA-4, surface	–	–	–	–	–	1	–	–	1
HP-2, GA-5, surface	–	–	–	–	–	–	–	6	6
HP-2, GA-6, surface	1	–	–	–	1	–	–	–	2
HP-2, GA-7, surface	–	–	–	–	–	2	–	–	2
HP-2, GA-8, surface	–	–	–	–	–	1	–	–	1
HP-2, GA-9, surface	–	–	–	–	–	1	–	–	1
HP-2, GA-10, surface	–	–	1	1	3	3	–	–	8
HP-2, GA-11, surface	–	–	–	–	1	–	–	–	1
HP-2, GA-12, surface	–	–	–	–	–	–	–	5	5
Locus E									
Square B, surface	1	–	–	–	–	–	–	–	1
Square C, Surface	1	–	–	–	–	–	–	–	1
Totals	11	1	2	2	16	23	1	33	89

Table 18. Provenience and Attributes of Worked Historic Glass, Locus C, CA-KER-229.

Cat. No.	Provenience	Color	Length[a]	Width[a]	Thickness[a]	Comments
181	surface	green	0.65	0.45	0.11	worked unifacial edge
126	TU-1, 10-20	clear	0.27	0.2	–	worked edge
436	HP-2, GA-10, surface	green	1.19	1.09	0.38	apparent core
437	HP-2, GA-10, surface	green	1.08	0.89	0.23	melted
328	TU-1, 20-30	clear	–	–	–	four flakes (0.14 g total)

a. In inches.

A total of 1,944 specimens were recovered from TU-1 (see Table 19). Most of the bone recovered from TU-1 was either lagomorph or lagomorph-sized (n = 1,803; 92.7 percent) of which 880 (48.8 percent) were burned. The majority of the identified artiodactyl specimens (n =45) consisted of tooth enamel, and most of the other deer-sized material (n = 84) was highly fragmented. Of the artiodactyl and deer-sized specimens (n = 129), 26 (20.1 percent) were burned.

A total of 1,609 specimens were recovered from the excavation of HP-2 (Table 20). This bone was mostly lagomorph or lagomorph-sized (n = 1,328; 82.5 percent), 534 (48.8 percent) of which was burned. As in TU-1, most of the artiodactyl specimens (n =19) consisted of tooth enamel, and most of the deer-sized material (n = 256) was highly fragmented. Of the 275 artiodactyl and deer-sized bones recovered, 113 (41.1 percent) were burned.

Discussion

Most of the animal bone represents lagomorphs, with a few rodents, a bird or two, and a few large mammals. More of the deer-sized bone, and a higher percentage of burned deer-sized bone, was found in HP-2 than in the general midden (TU-1) at Locus C. Very few rodents or rodent-sized animals were recovered, and there is no indication that they were eaten. Thus, it appears that there was no focus on very small animals, and perhaps the people at KER-229 were not under food stress.

The absence of any domestic species (e.g., cows or pigs) in the faunal material is of interest. The occurrence of Class H *Olivella* beads, glass beads, and modified historic glass indicates a post-Contact occupation, but perhaps the inhabitants or KER-229 lacked access to domestic animals. However, it is also possible that people rejected Euroamerican foods and chose to maintain an aboriginal diet even after contact.

Botanical Remains

A number of botanical specimens were recovered from the site, but few could be directly associated with the human occupation. An exception is the six juniper (*Juniperus* cf. *californicus*) posts found along the rim of HP-2 (Table 21; see also Figure 7) at Locus C. As previously noted, these small posts appear to have been sharpened prior to their placement in the ground. The exposed ends of most of the specimens are charred, suggesting that the structure had burned. In addition, many juniper seeds and charcoal of an unidentified wood were found in the Locus C midden.

Juniper currently grows on the site and was likely used for a variety of purposes, including structure posts and firewood. Zigmond (1981:35) reported that juniper was an "important source of food and manufactured items," including bows and foreshafts.

Obsidian Studies

Four obsidian flakes, all from Locus C, were sent to Northwest Research Obsidian Studies Laboratory for hydration rim measurements and for sourcing by XRF (Table 22). All were sourced to West Sugarloaf in the Coso Volcanic Field. The hydration rims range between 6.4 and 2.9 microns. The larger rims suggest some use during Elko times (two Elko points were found at Locus B but none at Locus C), but the absence of small rim measurements seems odd. As only four of the several thousand obsidian flakes were tested, this lack of smaller hydration rim values may be due to sampling error. The use of Coso obsidian is as expected.

Dating

The dating of the site relies upon temporally diagnostic artifacts (projectile points, beads, worked historic glass, and pottery), the presence of preserved wooden

Table 19. Distribution of Faunal Remains (NISP) from TU-1, Locus C, CA-KER-229.

Taxon	0-10	10-20	20-30	30-40	40-bedrock	Totals
Lepus californicus	–	–	–	–	1	1
Neotoma lepida	–	1	1	–	–	2
Dipodomys spp.	–	1	–	–	–	1
unidentified Artiodactyl	5	15	21	3	1	45
unidentified bird	–	–	2	–	–	2
rodent-sized mammal	–	1	2	–	–	3
unidentified lagomorph	13	22	21	6	2	64
lagomorph-sized mammal	203	514	894	102	25	1,738
deer-sized mammal	10	14	48	12	–	84
unidentified mammal	–	–	1	–	3	4
Totals	231	568	990	123	32	1,944

Table 20. Distribution of Faunal Remains (NISP) from House Pit 2,[a] Locus C, CA-KER-229.

Taxon	Total No.	Burned (No. and %)
Lepus californicus	1	–
unidentified Artiodactyl	19	–
rodent-sized mammal	1	–
unidentified lagomorph	65	–
lagomorph-sized mammal	1,263	534 (42.3)
deer-sized mammal	256	113 (44.1)
unidentified mammal	4	–
Totals	1,609	647 (40.2)

a. Units GA-1 through -12, surface and scrape to floor.

Table 21. Provenience and Attributes[a] of Juniper Structure Posts from House Pit 2, CA-KER-229.

Cat. No.	Unit	Length	Diameter	Weight	Comments
192	GA-4	420	–	–	missing
381	GA-9	320	35	98.1	proximal end charred, distal end sharpened
397	GA-7	400	75	–	proximal end charred, distal end sharpened
461	GA-8	340	45	–	rodent damaged
462	GA-8	230	28	–	proximal end charred
488	GA-7	391	64	525.2	–

a. Metrics in millimeters and grams. See Figure 7 for location of posts.

Table 22. Results of Obsidian Studies at CA-KER-229.

Cat. No.	Lab. No.[a]	Artifact	Provenience	Microns	Source
091	1	flake	Locus C, HP-1, 10-20	2.9 0.0	Coso, West Sugarloaf
288	2	flake	Locus C, TU-1, 30-40	4.5 0.1	Coso, West Sugarloaf
325	3	flake	Locus C, TU-1, 20-30	3.6 0.1	Coso, West Sugarloaf
269	4	flake	Locus C, TU-1, 40-60	6.4 0.1	Coso, West Sugarloaf

a. Northwest Research Obsidian Studies 208-46-.

posts at Locus C, and obsidian hydration data. No radiocarbon assays were obtained from the site.

The distribution of projectile point types is informative (Table 6). Locus C produced one Rose Spring, one Desert Side-notched, and three Cottonwood points. The Rose Spring point was found subsurface in excavation unit TU-1, suggesting some time depth to the occupation there. Locus B produced one Desert Side-notched, two Cottonwood, two Elko, and one Gypsum specimens, all from the surface. The presence of the Elko and Gypsum dart points suggests some time depth, perhaps even several thousand years. Locus E produced one Desert Side-notched, six Cottonwood, and two Rose Spring points, all from the surface.

The beads include specimens of shell and glass. Some of the shell beads are not temporally sensitive, but many of the shell beads were Class H *Olivella* types that generally date to the Late Mission Period, between about A.D. 1800 and 1816 (Bennyhoff and Hughes 1987:135). The glass beads are obviously late, and most (96.6 percent) were found at Locus C, suggesting a very late occupation of that locus. This late occupation of Locus C is further supported by the presence of four pieces of historic glass that appear to have been worked. The pottery dates to within the last 1,000 years or so. The presence of preserved wooden posts in HP-2 further argues for a late occupation as it seems unlikely that such materials would preserve for more than a few centuries. In addition, the presence of square nails indicates a late occupation.

In sum, the data suggest that during Elko and Gypsum times, the site was used on an ephemeral basis but that sometime during the Rose Spring Complex, perhaps as early as 1,800 B.P., the use of the site increased. By the time of contact (ca. A.D. 1769), people were living at KER-229 for extended periods (as seen by the development of midden).

Interpretations

The data allow varying levels of interpretation regarding chronology, site function, lithic technology, social structure, ethnicity, interaction and trade, and settlement/subsistence systems, each of which is discussed below. A general summary of artifacts recovered by locus is presented in Table 23. No human remains were found at the site.

Dating

Although no chronometric dates are available, the presence of the few dart points and some obsidian hydration data indicates the site was initially utilized, though not intensively, perhaps as early as 4,000 B.P. The relatively larger number of Rose Spring points suggests that activity at the site increased after about 1,800 B.P., and Locus C may have been first occupied after that time. Increased intensity of occupation, especially of Locus C, began after about 1,000 B.P.,

Table 23. General Distribution of Collected Material Culture by Locus, CA-KER-229.

Artifact Type/Locus	Locus C	Locus B	Locus E	Unknown	Totals
Metates	1	2	9	–	12
Manos	18	18	21	–	57
Bowls	–	2	–	–	2
Pestles	8	–	–	–	8
Pigment Grinder	1	–	–	–	1
Shaft Straightener	–	–	1	–	1
Pendants	4	1	4	–	9
Pointed Tool	–	1	–	–	1
Stone Beads	4	–	–	–	4
Projectile Points	14	17	17	3	51
Bifaces	2	18	5	5	30
Drill	–	–	1	–	1
Scrapers	3	5	5	–	13
Cores	8	8	13	–	29
Hammerstones	–	2	1	–	3
Edge-Modified Flakes	56	58	28	7	149
Debitage	3,300	4,853	4,742	24	12,919
Bone Awl	–	1	–	–	1
Bone Bead	–	–	1	–	1
Pottery	43	15	12	–	70
Shell Beads	13	10	65	–	88
Glass Beads	86	1	2	–	89
Totals (not including debitage)	261	159	185	15	620

as seen by the abundance of Desert Side-notched and Cottonwood points. The presence of late shell beads, glass beads, and artifacts manufactured from historic glass attests to an occupation that persisted into the nineteenth century.

Site Function

Locus C is interpreted as a habitation locality, with house pits, milling stations, possible granaries, and a variety of material culture, including most of the pottery (see Table 23). We hypothesize that Locus C was home to one or two families.

Locus B contained mostly artifacts related to lithic reduction and tool manufacture (points, bifaces, cores, hammerstones, and debitage) but there was some milling equipment, mostly manos. Locus B is interpreted as a lithic reduction area with some milling (of small seeds?) and little or no evidence of habitation.

Locus E contained a surprising diversity of material culture (see Table 23) but no evidence of habitation. The presence of considerable numbers of stone artifacts (points, bifaces, cores, and debitage) suggests that lithic reduction and tool manufacture were major activities. The presence of a relatively large number of

metates and manos indicates that Locus E also served as a processing locality, presumably for food. Two of the Locus E metate fragments were burned, suggesting that some fires were built, and the presence of faunal remains further indicates some domestic activity. Of interest is the fact that most (73.9 percent) of the shell beads were found at Locus E.

Lithic Technology

Lithic materials are abundant at the site. While there is evidence of biface reduction, the majority of stone working appears to have involved the rejuvenation of tools. The presence of mostly finished obsidian tools, an absence of obsidian cores, and the considerable quantity of obsidian debitage, suggests that obsidian tools were obtained in mostly finished form and reworked as needed. However, it is possible that obsidian bifaces arrived at the site as blanks to be completed as finished tools.

Social Structure and Ethnicity

The presence of a few structures at KER-229 suggests the presence of small social units, perhaps one or two families at a time. The later inhabitants of the site were most certainly Kawaiisu, but the ethnicity of the occupants prior to the Late Prehistoric Period is uncertain.

Interaction and Trade

Clearly, the inhabitants of KER-229 were engaged in trade involving shell beads from the Pacific coast to the west, obsidian from the Coso Volcanic Field to the east, and steatite, either from the coast (e.g., Santa Catalina) or the southern Antelope Valley (e.g., the Sierra Pelona). It seems likely that the chalcedony and chert were obtained locally. Later in time, a variety of historic goods, at a minimum including glass beads, other glass, and iron nails, were obtained. The paucity of other historical materials clearly used by Native peoples at the site suggests that any contact with Euroamericans was limited.

It is not clear what commodities (if any) were going out in exchange for the goods obtained. Possible outgoing commodities (e.g., Sample 1950) might have included silicious stone for tool manufacture, "rabbit" skins, or certain other important plant or animal products.

Settlement and Subsistence Systems

The KER-229 site appears to represent a small habitation locality for at most a few families, with some associated but separate milling and lithic work areas. The site is located adjacent to a much larger site (KER-230) that was simultaneously occupied, and it is possible that KER-229 may have served as an outlier to this large site. The nature of the relationship between people at the two sites is unknown.

People at KER-229 consumed a variety of resources. Animals included rabbits, deer, and birds. The presence of millingstones indicates some plant processing; manos and metates suggest the milling of small seeds, and the pestles suggest the processing of acorns.

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