EXAMINING "DEEP THERMAL FEATURES" AND THEIR SIGNIFICANCE IN THE UNDERSTANDING OF PREHISTORIC SAN DIEGO COUNTY ARCHAEOLOGY

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San Diego Gas and Electric (SDG&E) recently began work on the East County Substation Project (ECSP) in San Diego County in 2011. The project includes 14 mi. of 500/230/138-kV transmission line, 6 mi. of underground utilities, and two substations. This article focuses on a subset of thermal features that were uncovered during construction at one of the substations. These features contained the oldest accepted dates in the eastern Peninsular Range and also contained a set of prehistoric artifacts. This discussion addresses how these features became buried in context with surrounding topography, as well as related implications concerning surrounding surface features.

The East County Substation Project (ECSP) consists of 14 mi. of 500/230/138-kV transmission lines, including 6 mi. of undergrounded utilities, and two new substations. This project was approved by the California Public Utilities Commission (CPUC), as well as by the U.S. Department of the Interior and the Bureau of Land Management (BLM). The BLM, in consultation with the State Historic Preservation Officer (SHPO) and other consultants, determined and documented the area of potential effect (APE) as an alignment consisting of approximately 60 acres.

The main project area lies on the eastern margin of Jacumba Valley at the base of Jade Peak. This formation, Jade Peak, is a distinct geomorphic feature that consists of a volcanic cinder cone with exposed dikes and plugs, surrounded by alluvial deposits with low-relief ridges. The base upon which all the deposits rest is the Peninsular Range batholith, which dates to approximately 100 million years ago. The East County Substation lies on the west and southwestern slopes of Jade Peak, at an elevation of approximately 3,240-3,280 ft. above mean sea level.

The APE for the ECSP included a 100-ft. buffer surrounding all approved work areas. Within this APE, the area of direct impact (ADI) for the project is defined as encompassing a minimum of 45 m on each side of centerline of the right-of-way. Twenty-five new archaeological sites and 41 new isolates were recorded during the survey phase. Records for 11 previously recorded sites and one previously recorded isolate were updated during the survey phase. In total, 36 archaeological sites and 42 isolates have been identified within the project area.

An intensive cultural resources inventory was completed for the ECSP Project in order to identify and describe specific cultural resources in the approved survey corridor. The purpose of these surveys was to document the location of surface resource boundaries within the ECSP project area. Systematic pedestrian surveys with transect intervals no greater than 10 m were completed. In areas where previously recorded sites are mapped, a survey interval of 5 m between crew members was used to adequately re-identify previously recorded surface artifacts and features.

ARCHAEOLOGY BACKGROUND / JVAD

Portions of the project area for ECSP are located within the boundaries for the Jacumba Valley Archaeological District (JVAD). The JVAD is a significant example of a multiple-resource area that contributed to the understanding of Late Prehistoric resource exploitation. Sites within the JVAD shed light on much more than Late Prehistoric sites alone and reach back further in time than previously known. Sites that were evaluated for the project include CA-SDI-7074, SDI-19627H, and sites with the temporary designations of ECO-1 and ECO-2. Additional sites within the project boundary were left unaffected, protected by Environmentally Sensitive Area (ESA) signage, and roped off from project use or disturbance. It should be noted that boundaries for the project were confined and constrained by

specific project inventory corridors and not the actual manifestation of cultural resources on the ground. These boundaries may be arbitrary due to project restrictions.

During construction of the SDG&E 1982 Southwest Powerlink Project, the Jacumba Discontiguous Archaeological District (JDAD) was determined eligible for listing on the National Register of Historic Places (NRHP) by the BLM. During survey work performed in 2006-2007 for SDG&E's Sunrise Powerlink Project, large portions of this same area were revisited and archaeological site boundaries were updated. As a result of this updated survey work, ASM Affiliates expanded two areas and eliminated another two areas, so that the district is no longer discontiguous. The newly defined Jacumba Valley Archaeological District (JVAD) contains 144 prehistoric archaeological sites, nine isolates, and 10 ethnographic resources.

ETHNOGRAPHY

Ethnographic resources located within present-day Jacumba, as well as in the JVAD, were primarily recorded during the first half of the twentieth century. Subsequently, Clyde Woods is credited with recording much of the ethnographic record from indigenous Kumeyaay groups in the immediate Jacumba vicinity. Some locations were specifically identified based on geographical reference points, such as the Jacumba Hot Springs, Round Mountain, and Jacumba Peak. He wrote:

> This valley and the surrounding mountains were one of the most important Kumeyaay resource exploitation areas between the desert and the Pacific Coast. It has been identified as a multiple resource area (673m). There were major village sites (093e) in what is now the town of Jacumba and just north (387e), sacred springs (003a), a major trade area (086d) and the valley and surrounding region were utilized for agriculture (261d). There were major areas for plant (040b [mesquite gathering], 051b [jojoba gathering], 056b [yucca, Mormon tea, and basket grass gathering], 260b [manzanita berry and pinyon nut gathering], 321c [roots and basket grass for basketry], 324c [agave fibers for basketry]) and mineral (322c [manganese for pigment], 325c-327c [hematite for pigment, porphyry for flaked tools, agave fibers for basketry]). Fifteen additional villages were recorded in the area (376e, 377e, 388e, 391e-396c, 438e-442e). Nearby was a mountain for ritual and ceremony (004a), an eagle eyrie (200a) and at least one cremation and burial area (018a). A trail identified by Native Americans (147f) and in the literature (630f) connected Jacumba with Xachupai (379e) in the Imperial Valley. A similar Kumeyaay complex of villages, springs, gathering areas and sacred sites (Ha'cum) lies south of Jacumba below the international border [Woods 1982:71-72].

Other ethnographic resources for the Kumeyaay area include Gifford's 1918 and 1931 publications focusing on the desert-adapted Kumeyaay/Kamia of Imperial Valley. Castetter and Bell (1951) addressed ethnobotany, agriculture, and land-use patterns among the Yumans of the Lower Colorado River. DuBois (Laylander 2004), Waterman (1910), Spier (1923), Hohenthal (2001), and, of course, Florence Shipek (1982, 1989, 1991, 1993) wrote telling ethnographies of the Kumeyaay and Tipai of the Peninsular Range.

ARCHAEOLOGY IN THE APE

The archaeological site containing most of the evaluation and data recovery information is SDI-7074. Due to SDI-7074's scientific or information value as defined in Criterion D of the NRHP, data recovery, scientific study, and observation were determined the appropriate treatment for the archaeological values at the site. Results from the data recovery phase, which occurred in 2012, determined SDI-7074 as contributing to the NRHP / California Register of Historical Resources (CRHR) eligibility of the district as a whole, based on its ability to contribute to our knowledge of prehistory, under Criterion D / 4. It was found that the quantity, quality, and variety of artifacts and features distributed over the ADI can inform our understanding of a number of important research questions

concerning resource collection, intercommunity exchange, and the nature of prehistoric settlements, increasing our understanding of prehistoric occupations and lifeways. The ADI is situated immediately southwest of Jade Peak, with denser artifact concentrations and features occurring along an intermittent tributary of Carrizo Creek. The majority of the substation footprint is on an alluvial floodplain.

The archaeological site record for SDI-7074 includes myriad artifacts that are commonplace within the JVAD. The majority of these include concentrations consisting of thousands of pieces of lithic debitage and hundreds of ceramic sherds, mostly Tizon brown ware. Diagnostic artifacts include ground stone artifacts (metates, manos, pestle blanks, milling stone production flakes), hammer stones, edge-modified and utilized flakes, bifaces, choppers, scrapers, shell beads, and milling surfaces.

A previous survey by SWCA Environmental Consultants in 2007 recorded at least 49 pit/hearth features, while a 2009 survey completed by HDR did not record any features or soil pits. These pit/hearth features contained dark sediment (Munsell 10YR 3/2, very dark, grayish brown; 10YR 6/1, gray) compared to the surrounding landscape. In some cases, fire-affected rock (FAR) occurs around the burned "pit" area in a fan-like shape, depending on surrounding topography. The quantity of FAR ranges from dozens to hundreds of pieces from feature to feature. It was deduced during data recovery that the site had been the result of multiple occupations through time, but it was not until further testing and analysis that the site revealed just how long the occupation had been. During a resurvey for the CRHR and NRHP evaluation work at SDI-7074 for the project, ASM identified additional artifacts and features to the west, south, and east of the previous site boundary, incorporating previously recorded sites.

THERMAL FEATURES

Further analysis performed on diagnostic artifacts, soils, and carbon/charcoal samples was performed by PaleoResearch Institute and prepared for ASM in 2013. Soil samples from 11 thermal features at SDI-7074 were submitted, as well as charcoal from eight features, and various types of stone tools. A sample of features is discussed below, to give a view of what was included in the typical feature excavated at SDI-7074.

FX 16. This feature (Figure 1) was excavated in four control units to expose the entire subsurface component. FX 16 measured approximately 140 by 125 cm, with a maximum depth of 40 cm. The feature exhibited a circular, rock-lined appearance. The FAR sat atop a layer of dark black soil intermixed with charcoal. The northwest portion of the feature contained a hard, dense, burnt soil contingent which was different from the surrounding soil matrix. This anomalous portion measured 60 by 40 cm. Both portions of the feature contained FAR, and the differing portions exhibited no distinct differences, except for soil density. One burnt log was observed in the northeast corner of the feature and collected for a carbon sample. No artifacts were recovered in association with this feature. Both soil and carbon samples were collected for further analysis.

*FX 20***.** One pollen/starch sample was excavated from this feature, as well as two significant charcoal samples. The pollen represented the sunflower family, small quantities of juniper, pine, and oak. Since the cheno-am pollen frequency was slightly elevated in this sample, it indicates that these plants were processed in this thermal feature. The charcoal or fuel used for the oven was identified as juniper. This feature after excavation was completed is shown in Figure 2.

FX 67. This oven feature was also tested for pollen and starch. While no starch was identified, the soils were heavily dominated by the sunflower family, with small quantities of juniper, oak, sagebrush, *Ephedra*, wild buckwheat, legumes, grasses and chamise. Large quantities of microscopic charcoal were also noted, which is consistent with the feature's use as an earth oven. The loose construction of this feature is shown in Figure 3 as excavation was ongoing.

Figure 1. Thermal feature FX 16.

Proteins

A total of five tools were submitted for protein analysis: two percussors, two modified cobbles, and one ground stone. Three of these had positive results. One percussor tested positive for deer. This indicated that the tool was likely used to process remains from the deer family; it was likely used to pound and dislocate deer bones, probably from mule deer. The other two positive test results came from the other percussor and one modified cobble. These tested positive for yucca, indicating they were used to process plant material from a member of the Asparagaceae family, which likely in this area would have included century plant, desert agave, *Yucca whipplei*, Joshua tree, and Mojave yucca.

Unfortunately, fewer positive results were attained from the tools than anticipated. It is hoped that with further investigations and results of samples that have yet to return, we can get a broader spectrum of activities and uses for SDI-7074. While more data are always welcomed, the specifics that have been attained result in evidence for a varied occupation of the Jacumba region over at least 10,000 years.

As the construction phase for the ECSP moved on, it became clear that the most interesting cultural resources discovered were “deeply buried” thermal features. While the immediate identification

Figure 2. Thermal feature FX 20.

of these features was a simplistic classification, they were later determined to be one of two types of features: agave roasting pits, or hearths.

It is interesting to point out here that SDI-7074 produced five deep features that were well below the surface, varying between 240 and 610 cm in depth. The vast majority of features located in this area were visible on the surface or were present within 30 cm below the surface. These typical roasting pit features, earth ovens, and hearths were all similar to one another. The radiocarbon dates from the five features testify to 9,700 years of land occupation and human interaction within the area of Jacumba.

On the surface, they usually present themselves as dark brown or ashy soils that do not match the surrounding natural surface matrix. Sometimes there can be FAR associated with the soil discoloration, as is shown here in Jacumba. Charcoal may be present on the surface, but due to natural weather events, erosion, or bioturbation, may or may not be associated with the age of the feature. Very few artifacts were associated with any feature excavated at SDI-7074. A minimal amount of debitage, ceramics, or other common items were found inside the hearths or immediately surrounding them.

The deep features were observed and recorded in a more detailed fashion. While only five features of this type were recorded at the site, 542 total surface or slightly subsurface features were recorded. Due to the circumstances under which they were found, the deep features were usually disturbed by large construction equipment. Once they were observed by cultural monitors on the project,

Figure 3. Thermal feature FX 67.

they were quickly established as ESAs and subsequently evaluated by qualified archaeologists. The soils of these features were generally quite dark black, again with few or no artifacts inside. They exhibited the same type of structure as the surface features: FAR, with a surrounding black soil and charcoal from the fuel source.

One surface feature that was not consistent with this finding was FX 67. FX 67 was excavated in seven units while chasing an exotic-source lithic scatter south of the actual feature. The lithics found inside the feature and surrounding it included obsidian, jasper, brown chert, chalcedony, jasper/agate, and petrified wood. An example of these material types can be seen in Figure 4. The vast majority of these

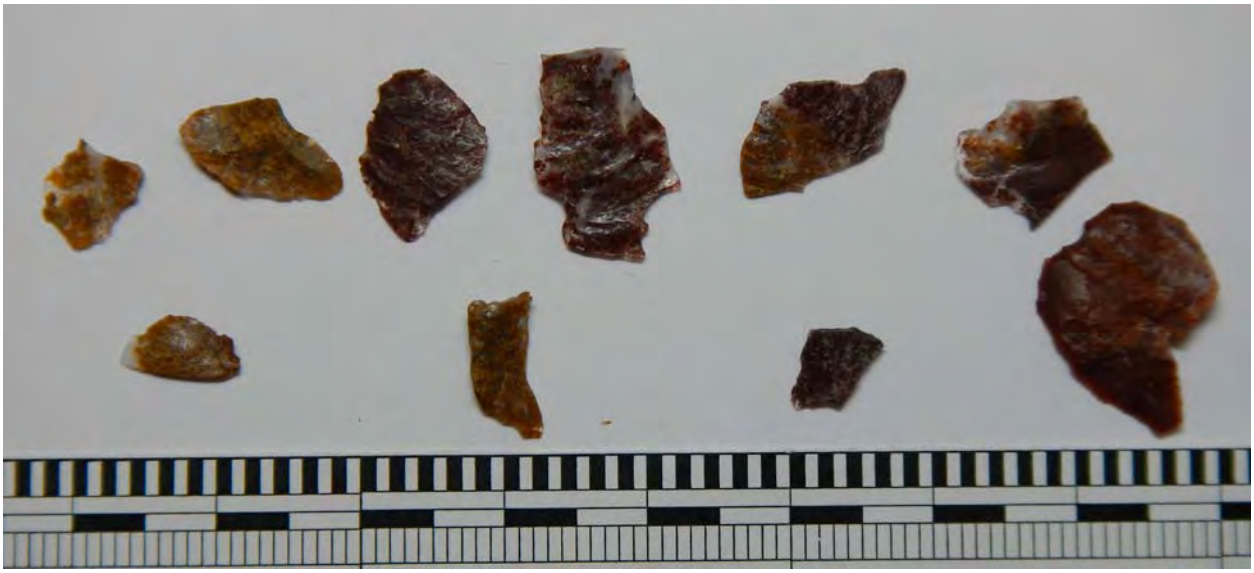

Figure 4. Examples of exotic-source lithic materials from feature FX 67.

were small interior flakes, some even considered microflakes. This would attest to a possibly lengthy single occupation at the site where people would rework their tools. However, outside of this small area, hardly any other lithic debitage was recovered other than the ubiquitous green porphyritic volcanic material. One large, well-used brown chert core was found on the eastern edge of the substation, but was likely not in its original location due to the phase of construction at that point.

This feature was rather large and spread out, possibly indicating that there were multiple features that joined together over time. It was not a compact, rock-lined pit like many features at SDI-7074, but rather an amalgamation of many different types of rock seemingly thrown together over a wide space. While pollen results confirmed that it was likely used as an earth oven, the structure of the excavated feature and the anomaly of the lithic debitage closely associated with the feature indicate that additional activities were occurring within or near the feature that were not detectable at any other feature in the immediate area.

CONCLUSION

While the large sample size of artifacts from SDI-7074 is very interesting when looked at as a whole, it is imperative that we combine our knowledge from this site with that from surrounding sites to get a clear picture of prehistoric activities, as none of these areas were created or used in a vacuum. One of the positive impacts of these large-scale clean-energy projects is our ability to conduct archaeological excavations and research in areas where it would otherwise not be possible.

The synthesis of all these data is meant to open the discussion of archaeological investigations that are taking place in eastern San Diego County and of how archaeologists may be able to use them in a regional context. Applying newly analyzed data to other projects for the preservation and continued research on cultural resources throughout the practice of CRM is paramount. Showcasing projects worked on for many years is important to keep research methods and results current and open to additional interpretation from an involved and aware archaeological community. Paramount to this discussion is to include information from all those involved, from students to CRM professionals to tribal consultants.

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