The fence consists of one unmilled wood post and three milled wood posts connected with barbed wire and chicken wire forming a L-shape. At this time it is impossible to determine the original size or intended use of the fence. Historic artifacts at the site consist of food and beverage containers, a few ceramic dishware fragments, building materials, and automobile parts. The food and beverage cans are primarily concentrated north of the fence in two adjacent clusters, although a light scatter of cans is dispersed throughout the site, while the building materials and automobile parts are located predominantly near the fence. Building materials, which are dispersed randomly, consist of one barrel hoop, cement fragments, cinder blocks, and sheet metal fragments. The automobile parts consist of one rusted car chassis (unidentifiable make/model), and a fender.

Figure 4-21 CA-SDI-21496 Overview photograph, facing north

Historic period artifacts identified on the ground surface include: 54 key-strip rectangular sardine cans, 56 hole-in-top milk cans, 25 knife-cut sanitary vegetable cans, 18 oblong key strip meat cans, 10 punched hole cans, 2 oblong, external friction utility cans, 16 cylindrical knife-cut cans, and at least 45 bi-metal pull tab beverage cans. Glass artifacts include: brown beer bottle fragments (one base, two finishes), one colorless ketchup bottle base, two colorless milk bottle bases, two colorless wine jug bases, one brown Clorox bottle finish, 200+ window glass sherds, one aqua wine jug fragment, one colorless jar finish, and one condiment bottle finish. Maker's marks on glass bottles include Hazel-Atlas (1902-1964; milk bottles and colorless wine jug) and

Glass Containers, Inc. (post-1945; ketchup bottle). Ceramic artifacts include 8 yellow glazed stoneware plate fragments and one off-white glazed stoneware plate fragment.

SSU 98 was excavated to a depth of 10 cm in the western artifact cluster. Identifiable artifacts are consistent with surface artifacts and include: one milk bottle base with Hazel-Atlas maker's mark, one beer/soda bottle base (Hazel-Atlas), one probable liquor bottle (Glass Containers Inc.), 20 threaded closure jar finish fragments, one champagne bottle finish, catsup/condiment bottle shoulders, a milk bottle body fragment, two unidentifiable body fragments with cursive Duraglas embossed marks, and one whiteware plate, a 1905 Indian Head penny, a key-strip sardine can, and two bolts. A small amount of unidentifiable metal fragments, window glass, and other glass bottle shards, and plaster were also recovered. Artifacts recovered from the SSU were concentrated in the upper 5 cm of the unit and no artifacts were observed in the floor of the unit. Sediments in the SSU consist of loose, brown (7.5YR 3/4) silty sand with about 25% pebble inclusions. No evidence of burning, or prior excavation for a pit/privy were identified in the area.

Chronological placement of the site can be determined estimated by a number of diagnostic items. The Hazel-Atlas Glass Company used the "H over an A" logo from 1902 to 1964 and Glass Containers Inc. used the interlocking G-C logo after 1945 (Toulouse 1971). The cursive Duraglas logo was used by the Owens Illinois Glass Company from 1941-1963. The Indian Head penny, which dates to 1905, may have been held onto and discarded long after its manufacture date, as it is still legal tender.

Historic topographic maps, available at www.historicaerials.com, indicate the presence of a structure approximately 600 m to the northeast (outside the project area). The structure is present on maps from 1944-1958, but is no longer present on the 1961 map. Aerial photographs from that time period, available at www.earthexplorer.usgs.gov, are not of sufficient resolution to identify any structures. Given the overlapping dates, the site may be related to that structure, however, at this time there is nothing directly connecting the structure and this site, and an equally plausible explanation is that the site represents a single dump episode derived from another off-site location.

CA-SDI-21497

This site consists of a small, light density historic refuse scatter covering a 42-x-85-m area (Figure 4-22; Confidential Appendix C). The scatter consists of one small concentration of domestic refuse near the center of the site, with wind and water dispersed items spread primarily to the west (Figure 4-23). Grid point 14, which consisted of a CSC and SSU, was placed within the site, just south of the main concentration, although efforts at that location were focused upon identifying potential prehistoric materials as part of the distributional testing.

Figure 4-22 CA-SDI-21497 Site Sketch Map (Confidential Appendix C)

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Figure 4-23 CA-SDI-21497 Site overview photograph, facing north

Metal artifacts at the site include 24 hole-in-top milk cans (2-15/16-x-4-in), 21 internal friction opened sanitary cans, one rotary opened spice can, one "KC" baking powder can lid, and one toy airplane. Glass artifacts identified at the surface are all fragmentary, and no identifiable makers' marks or bases were found. Identifiable fragments include 20 clear window glass fragments, one colorless drinking glass finish, a neck and finish from a colorless wine jug (presumably 1-gallon size), and one brown body and neck fragment of a medicine bottle. Ceramic artifacts include one yellow glazed stoneware bowl fragment, one orange glazed stoneware bowl fragment, and one light blue glazed stoneware cup fragment; no maker's marks were identified on the ceramic fragments. Artifacts collected from the surface include the toy airplane and the spice can.

One STP (99) was excavated to a depth of 40 cm at the concentration to examine the site for subsurface deposits. No artifacts were recovered from the STP, other than several small, unidentifiable metal fragments found in the upper 5 cm. Sediments encountered in the STP consisted of light brown loose, silty coarse sand.

Refuse at the site is consistent with domestic refuse. Although no precise dates for the site could be identified from the refuse, as no diagnostic items were observed, an estimated date range of 1917-1929 can be determined based on the hole-in-top cans (Simonis n.d.). As no evidence for a structure or residence of any kind is present in the area, it is likely that the site is the result of a single dump episode. Historic topographic maps, available at historicaerials.com, do not cover that time period. Later maps depict a structure located approximately 450 meters to the east

between 1944 and 1958. At this time it is not possible to determine if the refuse is associated with that structure or if the refuse originates at another location and was randomly dumped here. No evidence indicating a privy, pit, or natural depression are present at the site into which additional artifacts could have been deposited.

4.2.3 Laboratory Analysis

This section presents the results of the laboratory analysis of cultural materials recovered during the field evaluation. Only prehistoric materials are discussed since sufficient detail on historic archaeological materials was provided in the respective site sections (CA-SDi-21496 and CA-SDI-21497).

Flakedstone

In the following sections, the results from the debitage analysis are discussed, followed by bifaces, retouched flakes (RTF), simple flake tools (SFT), formal flake tools (FFT), core/cobble based tools, and hammerstones.

Debitage

Debitage constitutes the vast majority of artifacts recovered during the evaluation, as was expected, given the presence of the quarry. Of the 3,077 pieces recovered, 2,175 (70.7%) were analyzed. Shatter constitutes a minor plurality of all debitage (n=770; 35.4%), with early and late cortical flakes (n=704; 32.4%) and early and late interior flakes (n=697; 32.1%) in near equal abundance (Table 4-11). Late stage flakes, such as biface thinning flakes (n=2; 0.001%) and pressure flakes (n=2; 0.001%) are essentially absent from the assemblage.

Flake size is much more diverse (Table 4-12), with 60.0% (n=1,305) of all debitage ranges between 3 and 8 cm in size. Small debitage (<3cm) constitutes 33.2% (n=722) of the sample, while large debitage, (>8 cm) constitutes only 6.8% (n=148). Average flake size overall is 4.6 (size 5).

Basalt (n=1,898; 87.3%) dominates the assemblage. Other volcanic materials (n=167; 7.7%) and quartz (n=71; 3.3%) the only other materials representing greater than 1% of the sample (Table 4-12). This certainly fits the expected outcome, given the presence of the basalt outcrop in the southwestern part of the Project area, and more substantial basalt sources in the greater region. The dearth of non-basalt materials limits analysis of debitage size or type for other volcanic stone or quartz as the sample size is too small to draw meaningful conclusions. However, all other materials generally reflect a debitage profile biased toward early stages of reduction, with insignificant amounts of biface thinning or finishing flakes. Of the five pieces of obsidian debitage, two are pressure flakes and all are small; a fact consistent with expectations that obsidian had to be transported great distances and suffered from significant rates of attrition resulting in a bias toward small flakes.

The results from the debitage analysis are consistent with other regional studies in that flakedstone reduction was based on expedient cobble-core reduction, rather than the more intensive prepared platform technique (see Becker and Iversen 2006; Flenniken et al. 2004; Hale 2009; Williams et al. 2014). Cobble-core reduction involves splitting a cobble to create an immediate platform (i.e., fractured cobble edge) from which flakes can be struck. In contrast, a prepared core (e.g., bifacial core) has intentionally shaped platforms—usually bifacial—that take more time to prepare than a split cobble but produce more regular and predictable flakes. Prepared cores are often found in areas lacking readily available raw materials and among highly mobile societies that incur greater transport costs and can be expected to minimize the mass of a core that is carried from place to place.

The generally high percentage of shatter (n=770; 35.4%) is indicative of a cobble-core reduction strategy in which large amounts of shatter are produced during the initial stages of cobble breakage and platform reduction. Large amounts of shatter are also anticipated from harder and poorer quality raw materials—those tend to have poorer flaking properties than finer grained materials. The almost complete absence of late stage flakes (biface thinning and pressure; <0.1%), indicates that tool finishing and resharpening essentially did not occur in this area.

Interpretation of the reduction process in the study area is clearly heavily influenced by the presence of the quarry – the sheer magnitude of material present in that concentrated area overshadows everything else, and therefore, could lead to the conclusion that reduction activities in the remainder of the ADI are the same as in the quarry. However, when the data is examined in order to compare the quarry versus all other recovered materials, variability in the reduction sequence is observable.

Nearly the entire measured range of flake types and sizes are present in the quarry (with the exception of a few pieces of debitage measuring less than 2 cm). This could give the impression that core/cobble reduction occurred well beyond basic cobble assaying and mass reduction at the quarry, as is often interpreted for non-residential/habitation sites in San Diego County, to the point of core platform preparation and/or early-stage biface production. Comparing debitage type by location (excluding shatter), the quarry area has the highest proportion of cortical flakes (types 1 and 2, 18.9%) and 13.4% early and late interior flakes, whereas the non-quarry sample has 13.4% cortical flakes and 26.1% early and late interior flakes (Table 4-12). This reversed pattern indicates that early and late interior flakes were more commonly transported off of the quarry site. This seems at odds with the idea that the quarry was utilized for mass reduction/assaying, which should theoretically result in mostly cortical flakes and shatter. In other words, although the quarry contains the most interior flakes by site (and more than the rest of the study area combined), it does so in a significantly reduced ratio versus the other debitage types.

Table 4-11
Debitage by Flake Type and Material

Material	Flake Type								Total (n)	Total (%)
	1	*2*	*3*	*4*	*6*	*8*	*11*	*12*		
Basalt	202	406	362	258	2	1	337	330	1898	87.3
CCS		4		2			3	1	10	0.5
Granitic		1		3					4	0.2
Obsidian				1		1	2	1	5	0.2
Quartz crystal								1	1	0.1
Quartz	1	6	9	22			11	22	71	3.3
Quartzite	2	4	1				8	3	18	0.8
Volcanic	22	55	25	14			35	16	167	7.7
Wonderstone		1							1	0.1
Total (n)	**227**	**477**	**397**	**300**	**2**	**2**	**396**	**374**	**2175**	**100**
Total (%)	**10.4**	**21.9**	**18.3**	**13.8**	**0.0**	**0.0**	**18.2**	**17.2**	**100**	

Note*: 1, primary decortification; 2, secondary decortification; 3, early interior; 4, late interior; 6, early biface thinning; 8, finishing/pressure; 11, non-diagnostic cortical shatter; 12, non-diagnostic non-cortical shatter

Table 4-12
Debitage by Flake Type and Size

Size+	Flake Type*								Total (n)	Total (%)
	1	*2*	*3*	*4*	*6*	*8*	*11*	*12*		
1		2		4		2	2	24	34	1.56
2	8	12		114	1		29	78	242	11.13
3	26	49		182	1		76	112	446	20.51
4	12	75	150				81	69	387	17.79
5	40	91	104				68	39	342	15.72
6	34	82	85				58	25	284	13.06
7	29	60	30				34	12	165	7.59
8	30	56	14				18	9	127	5.84
9	21	26	8				11	3	69	3.17
10	12	13	2				7	2	36	1.66
11	6	8	2				6		22	1.01
12	5	1	2				2		10	0.46
13	2	2					3		7	0.32
14	2						1		3	0.14
15								1	1	0.05
Total (n)	**227**	**477**	**397**	**300**	**2**	**2**	**396**	**374**	**2175**	**100**
Total (%)	**10.44**	**21.93**	**18.25**	**13.79**	**0.09**	**0.09**	**18.21**	**17.20**	**100**	

Note *: 1, primary decortification; 2, secondary decortification; 3, early interior; 4, late interior; 6, early biface thinning; 8, finishing/pressure; 11, non-diagnostic cortical shatter; 12, non-diagnostic non-cortical shatter.
+: Sizes classified as 1= less than 1 cm: 2= greater than 1, but less than 2 cm; 3= greater than 2 but less than 3 cm; etc.

Bifaces

One basalt projectile point fragment/late-stage biface (Cat. no. 399) was recovered from the ground surface from the general project area (Figure 4-24). The fragment measures 61.69 x 38.43 x 11.83 mm and weighs 24.3 g. Given the size, it may be a spear point, as it is much larger than typical arrow points, or may simply be a late-stage biface. As it is only a distal fragment, it cannot be typed. The biface has hinge and step fractures on the dorsal surface and step fractures on the ventral surface. The proximal (broken) end exhibits a bending break, indicating that the point was broken during manufacture.

One bifacially flaked basalt drill was recovered from site CA-SDI-21492 (Cat. no. 339; Figure 4-24). The drill measures 58.15 x 27.08 x 9.51 mm and weighs 10.3 g. The drill was made from an interior flake, and has a bit length of 23.73. The drill has been blunted on the distal end and has bifacial flake scars present up to the broken proximal end, indicating that it was used extensively prior to discard.

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CAT: 339
Site: CA-SDI-21492

CAT: 399
Site: GNRL

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FIGURE 4-24
Bifaces

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Flake Tools

The flake tool category includes retouched flakes (RTF, n=54) and simple flake tools (SFT, n=12), and formed flake tools (FFT, n=2) (Table 4-13; Figures 4-25 and 4-26). Attributes measured for each kind of flake tool included: material, condition, basic metrics, flake type, edge frequency, edge damage, edge use wear, and edge angle.

As with debitage, the majority of flake tools are made of basalt (n=43; 63.2%) although they constitute a reduced ratio compared to the overall flake tool assemblage than debitage. Non-basalt volcanic materials (n=18; 26.5%) constitute a significantly larger share of flake tools than expected, given their percentage of the debitage. This could be the result of the finer-grained nature of many of the tools classified as non-basalt volcanic, which is more easily worked into tools than the medium-to-coarse grained materials identified as non-basalt volcanic, or may result from material identification errors between basalt and non-basalt volcanics.

Average maximum length, width, and thickness for flake tools were calculated for the entire assemblage. Simple flake tools are on average the smallest flakes, with retouched flakes and formed flake tools based on increasingly larger flakes. It appears that the smallest flakes were deemed sufficient for some purpose and were simply used as is, while increasingly larger flakes were selected for greater levels of retouch/flaking prior to use. Considering both retouched flakes and formed flake tools by definition require removal of flakes off of at least one edge, it seems a little surprising that the size ratio is so consistent, and that flake tools were not modified after use (i.e., extensively rejuvenated). The difference in size between SFT and RET/FFT is minimal, suggesting that larger flakes used as RET or FFT may have simply had greater protrusions or masses that required reduction prior to use.

Table 4-13
Attribute Data for Retouched Flakes and Simple Flake Tools

Attribute		Formed Flake Tool	Retouched Flake Tool	Simple Flake Tool
Total		**2**	**54**	**12**
Condition	Whole	2	47	12
	Fragment		7	
Metrics (mm) (average)	ML	74.64	72.76	68.10
	MW	60.07	50.92	44.36
	MTH	37.62	22.22	18.97
Flake Type	Cortical	1	30	9
	Interior		15	3
	Indeterminate	1	9	
# Edges	1		39	10
	2	1	10	

Table 4-13
Attribute Data for Retouched Flakes and Simple Flake Tools

Attribute			Formed Flake Tool	Retouched Flake Tool	Simple Flake Tool
	3			5	2
	4		1		
	Total # Edges		**6**	**74**	**16**
Edge Shape	Concave	Regular		7	3
		Irregular	1	3	
	Convex	Regular	3	19	3
		Irregular		18	
	Straight	Regular	1	17	9
		Irregular		10	1
	Perimeter	Regular			
		Irregular	1	1	
Edge Modification	Unifacial Microflaking		2	38	6
	Bifacial Microflaking		3	24	10
	Edge-Rounding			3	
	Unifacially Flaked		2	46	
	Bifacially Flaked		1	11	
	Polish				
	Step Fracturing		2	31	3
	Battering		2	1	
	Grinding			1	
Average Edge Angle (degrees)			69	54	45
Material	Basalt		2	33	8
	Volcanic			16	2
	CCS			2	2
	Quartz			2	
	Quartzite			1	

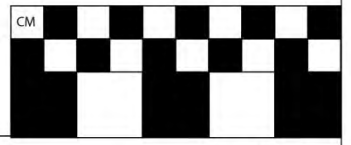

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FIGURE 4-25
Retouched Flake Tools

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CAT: 319
Site: GNRL
CAT: 297
Site: CA-SDI-21492
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9.30.2014
FIGURE 4-26
Formed Flake Tools
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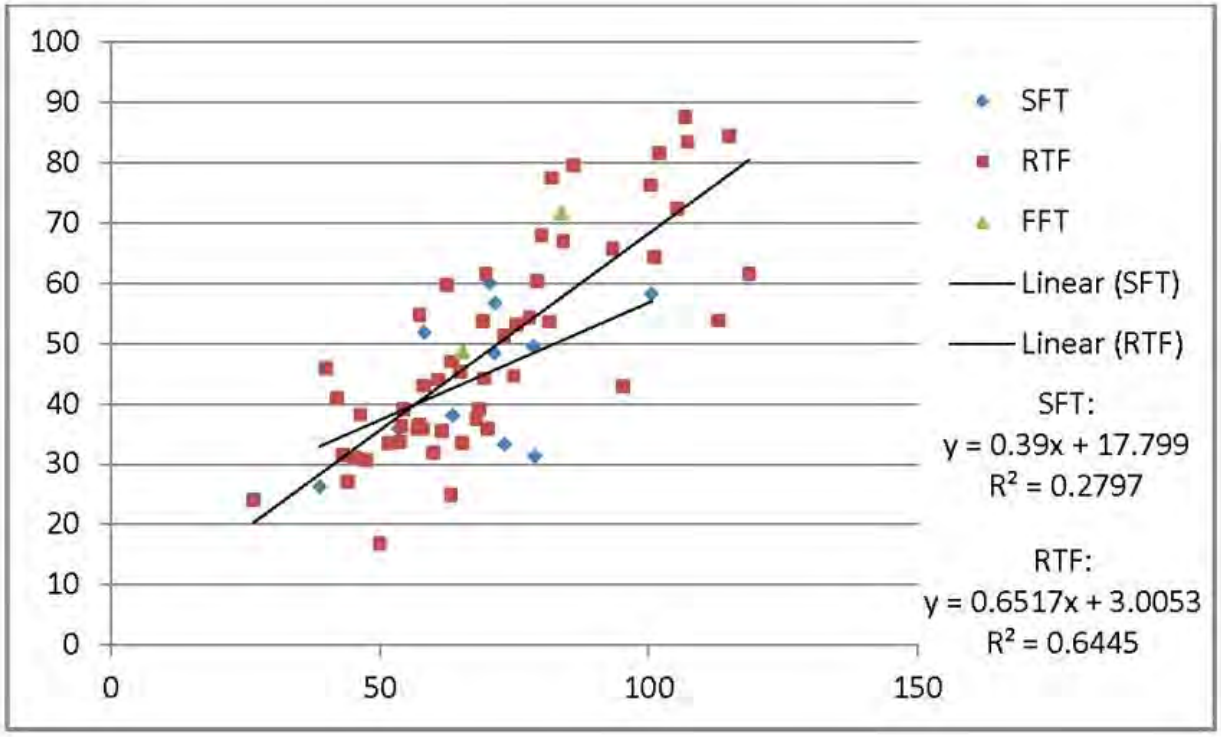
To quantify the regularity of flake tool outline, a regression was conducted on length and width measurements for SFTs and RTFs. The SFT regression returned a R^2 value of 0.28, with a slope of 0.39 and an intercept of -17.80 (Figure 4-27). These results indicate that there is a very weak relationship between length and width, with only 28% of the variation in SFT length predicted by width. The RTF regression returned a R^2 value of 0.64, with a slope of .65 and an intercept of 3.01 (Figure 4-27). These results indicate that there is a much stronger relationship between length and width of RTFs than SFTs. Given the minimal number of FFTs, a statistical analysis of these tools is unwarranted. However, as seen in Figure 4-27, FFTs are relatively consistent with the RFT size profile and relationship between length and width.

Figure 4-27 Linear Regression Graph Predicting Length from Width for SFTs And RTFs



The strong relationship between length and width implied by the RTF regression indicates that a parent flake of particular dimensions was preferred, regardless of size. It appears that flakes of a particular shape were either scavenged or produced for retouching/alterations, while SFTs, were simply used without regard to size or shape. Higher R^2 values would be expected for lithic technologies with flake tools produced for very specific tasks and with greater formality in lithic reduction.

Cores and Core/Cobble Tools

A total of 117 cores and core/cobble tools (CCT) were collected, 93 of which were analyzed. Of these, 78 are cores and 15 are core/cobble tools (Table 4-14), which display edge modification indicative of retouching and/or utilization. Twelve cores and six core/coble tools display evidence of battering, indicating that they were used as both hammerstones and as cores. In general, most of the cores are large, globular or tabular cobbles with only a few flake scars and a high percentage of cortex still intact. As with debitage and flake tools, basalt is by far the most abundant material (n=71; 76.3%), with non-basalt volcanics comprising the only other significant quantity (n=15; 16.1%).

Cores are fairly evenly distributed by type, with the notable absence of bipolar cores, and the minimal amount of bifacial cores. Assayed cobbles (n=26) and unidirectional cores (n=27) constitute the majority of the assemblage. These specimens do not display any platform preparation and indicate a minimal time investment in the procurement of potentially useful flakes.

Of the 15 CCTs, nine contain retouched edges which appear to be represent intentional shaping/sharpening of the used edge, while six display only microflaking and step fracturing, indicative of opportunistic use and/or scavenging of the core. Scavenging of previously discarded cores is also evidenced by two CCTs (Cat. no. 607 and Cat. no. 534; Figure 4-28) that have patinated flake scars which were retouched (removing portions of the patinated surfaces) and then used as scrapers. Two other CCTs of note include one cobble retouched around a natural protrusion, which created a drill tip (Cat. no. 20) and one retouched cobble tool with a small burin-like protrusion with unifacial microflaking and step fracturing (Cat. no. 357) (Figure 4-28). The remaining CCTs are generally large, bulky cobbles which likely used platforms and flake scar edges as choppers.

Core and core tools are unevenly distributed across the study area, 65% (n=61) collected from the quarry. This seems to indicate that instead of simply removing unwanted cortex and mass to transport desired cores, elsewhere, knappers may have instead been collecting flakes for transport and later use, while leaving the cores behind. However, this is unlikely the case, as cores recovered from the quarry are heavily skewed by the number of assayed cobbles (23 of the total 26 assayed cobbles).

Table 4-14
Core and Core/Cobble Tool Analysis Table

Attribute		Cores	Core/Cobble Tools
	Total	**78**	**15**
Condition	Whole	76	14
	Fragment	2	1
Metrics (mm) (average)	ML	100.04	94.59
	MW	75.71	71.56
	MTH	53.82	42.71
Flake Length (mm) (average)	ML	54.51	40.93
Core Type	Unidirectional	21	6
	Bidirectional	16	2
	Multidirectional	13	3
	Bifacial	2	4
	Assayed Cobble	26	
# Platforms	1	29	5
	2	32	6
	3	13	2
	4	4	2
	Total # Platforms	**148**	**31**
Platform Configuration	Unidirectional	102	18
	Bidirectional	12	
	Multidirectional	22	5
	Bifacial	12	8
	Bipolar		
Platform Type	Cortex/Exterior	74	14
	Interior	64	14
	Dorsal	6	
	Ventral	2	1
	Perimeter		1
	Indeterminate	2	1
Material	Basalt	63	8
	Volcanic	8	7
	CCS	1	
	Quartz	3	
	Quartzite	3	

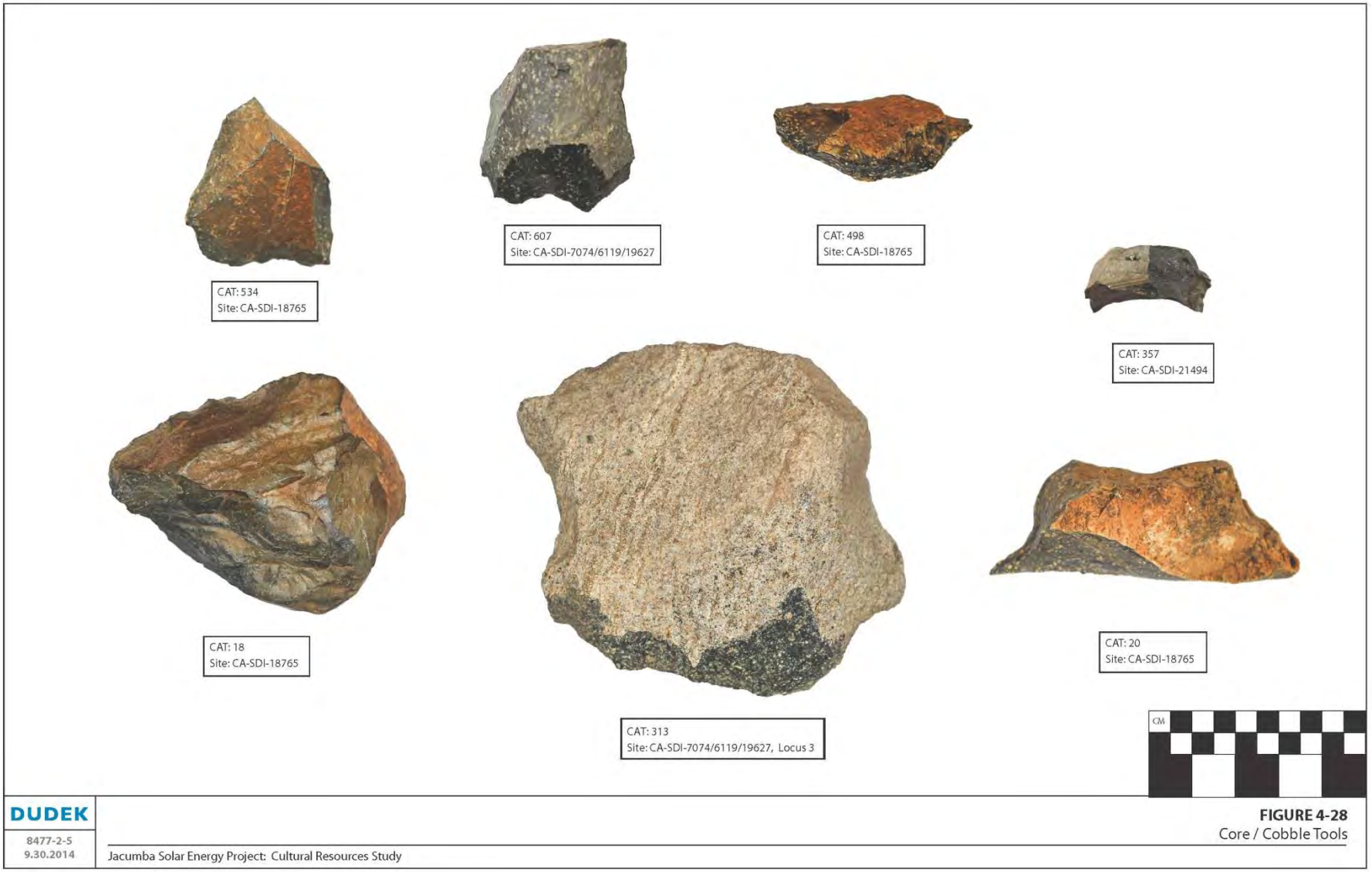


FIGURE 4-28
Core / Cobble Tools

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Percussion Tools

Ten percussing tools (hammerstones) were recovered during the evaluation, including nine made of basalt and one of quartzite. Four of the hammerstones exhibit battering on the margins of the rocks, four exhibit both margin and end battering, one exhibits battering around the perimeter of the rock, and one displays battering on both the dorsal and ventral faces, as well as on both ends. On average, the complete hammerstones (n=7) measure 84.58 x 64.90 x 49.85 mm and weigh 836.81 g. The three fragmentary hammerstones measure 93.74 x 54.27 x 39.96 mm and weigh 343.73 g. Three hammerstones display secondary modifications, although none have been fire affected. Three hammerstones (Cat. nos. 274, 486, and 488) have had multiple flakes removed from them, which appear to be for shaping, rather than flake production. The quartzite hammerstone (Cat. no. 247; Figure 4-29) is lightly ground and polished along its broken medial edge, indicating use as a handstone as well.

In addition to flake removals, Cat. no. 488 (Figure 4-28) is noteworthy for is size. While all of the other hammerstones can easily be held by one hand, this specimen weighs almost 3 kg and is about twice the average size of the hammerstones (170 x 154 x 85 mm). While it could have been used singlehandedly, it was likely held with both hands and rotated often, as extensive battering is present around the entire perimeter. It was also likely used as an anvil, as the ventral face is unmodified, while the dorsal face is moderately battered. Use as an anvil would imply bipolar percussion, which is interesting considering that no bipolar flakes or cores were identified.

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CAT: 485
Site: CA-SDI-21494

CAT: 247
Site: CA-SDI-7074/6119/19627

CAT: 488
Site: CA-SDI-18765

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FIGURE 4-29
Percussing Tools

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Percussing tools were dispersed relatively evenly throughout the study area, with no more than two at any specific site, and only 4 in the general non-site area. Surprisingly, only one hammerstone was collected from the quarry. Even when including battered cores and cobble tools in this category, the even distribution holds, with five at the quarry, four at CA-SDI-7074/6119/19627, five in the non-site area, and two each at CA-SDI-21492 and CA-SDI-21494.

Summary of Flakedstone Analysis

Overall, lithic reduction within the project area reflects expedient reduction of locally available raw material masses to produce expedient cutting, chopping and pounding tools intended for immediate, local use, whether intensive or not. The presence of a basalt outcrop within the study area provided a unique look into tool production and use, but also indicated that the quarry area itself was probably targeted for extraction and processing of agave, given the relatively large number of lightly used flake tools discarded within the quarry limits. To be sure, it is expected that flake tools discarded at the quarry in exchange for fresh flakes would have exhibited higher levels of attrition warranting replacement. Considering areas within and outside of the quarry, larger amounts of cortical flakes within the quarry limits are expected, as is the greater proportion of interior flakes found in non-quarry deposits.

Groundstone Tools

The groundstone tool category consists of tools used to process vegetal foods, such as seeds, nuts, and grains, and includes handstones, millingstones, pestles, and mortars. Attributes measured for these tools include: material, condition, basic metrics, surface frequency, surface type, surface shape, use (polish, striations, pecking), and secondary modifications.

A total of 23 groundstone tools were recovered, including 12 handstones, eight millingstones, and three indeterminate fragments (Table 4-15). Handstones (Figure 4-30) were primarily comprised of end and margin fragments with only one whole specimen (Table 4-15). However, most of these end and margin fragments constituted more than half of the artifact and thus provided a good measure of handstone use. Likewise, interior fragments exhibited both opposing faces of the stone, allowing measurement of surface frequency. With nine specimens able to be measured for shaping, six of these (66.7 %) were highly shaped (Table 4-15). Highly shaped specimens exhibited one or more wear facets with all of the typical signs of wear: smooth, polished surfaces that have been pecked for rejuvenation. Of the 18 measurable surfaces, 14 were pecked (including those on lightly shaped or unshaped specimens) indicating that all handstones were retained in a toolkit long enough for roughening up of the wear facet to become economical (smooth surfaces are not as efficient for the early stages of seed processing; see Hale 2001). Secondary modification in the form of end battering or burning was not uncommon, occurring on

30% of specimens, each. This proportion fits with southern California in general; handstones were typically used for many different grinding and pounding purposes (Hale 2001).

Millingstones (Figure 4-31) are mostly fragments (n=5) with three whole specimens that are relatively small, averaging 25 x 15 x 10 cm in size (Table 4-15). All other fragments also appear to derive from relatively small millingstones. The small size of millingstones is probably related to scavenging of local tabular stone for local processing since none of these items was shaped more than knocking protrusions off, and tabular stone is not available in large pieces from local outcrops. All specimens are made from local granite available from hillsides to the north and east. Three millingstones had more than one surface resulting in a total of 12 wear facets that were analyzed for use wear. Out of these 12 facets, all are smooth, polished and pecked, and six are striated indicating somewhat intensive processing, even if on a short term basis. The flat shape of millingstone surfaces is more related to the type and intent of processing. Flat surfaces are typically equated with grinding small, hard seeds, and the avoidance of manufacturing a dished (basined) surface (Hale 2001, 2009). The multipurpose role of groundstone tools in general is supported by the fact that most (n=5) were recycled as heating stones, and one was also used as an anvil. While not directly discernable, indeterminate groundstone fragments exhibit attributes consistent with both handstones and millingstones (see Table 4-15).

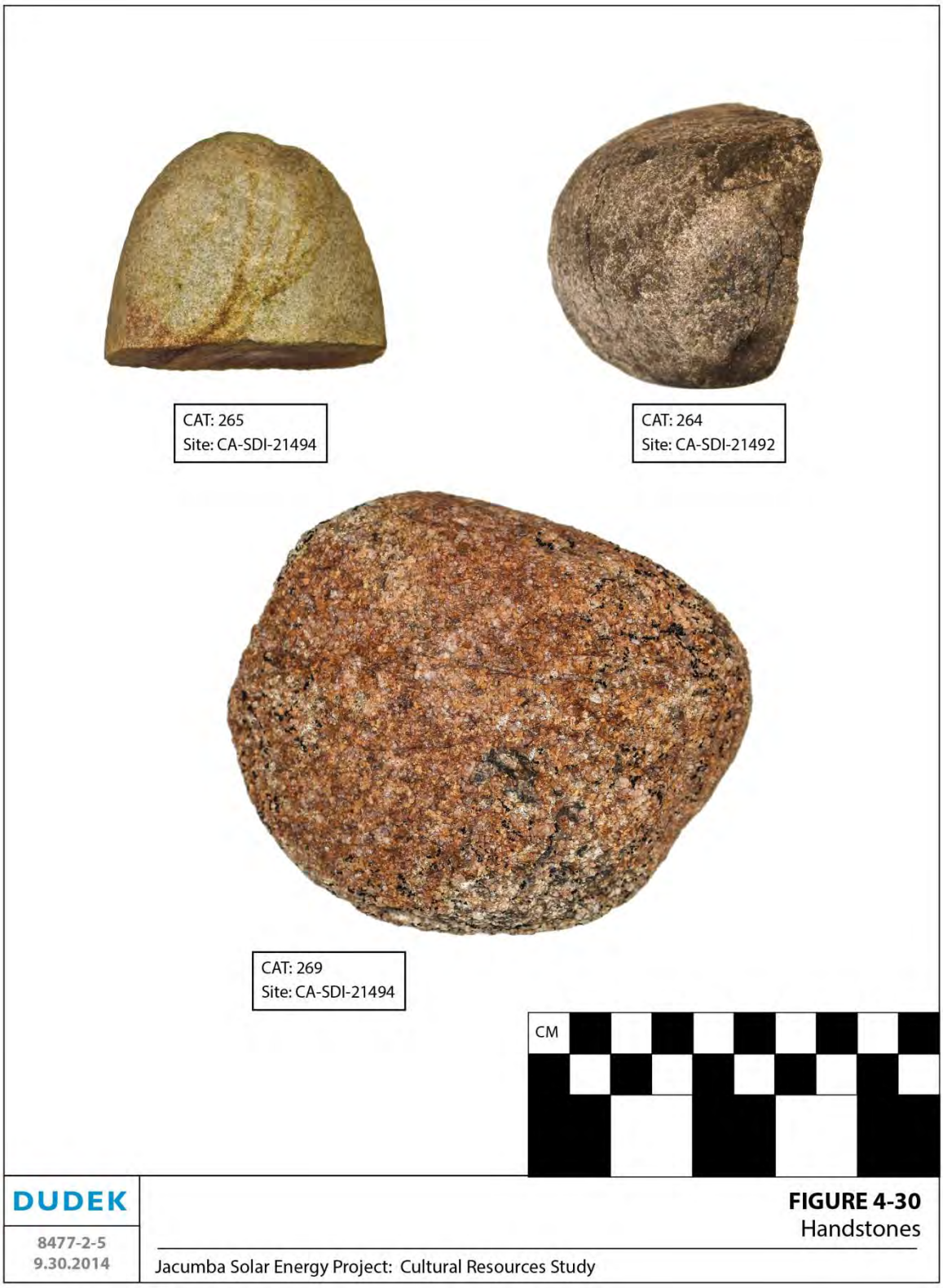
Groundstone tools recovered from the Jacumba Solar Project site evaluations reflect short term intensive use. In fact, it is probable that millingstones were left at the location of processing and reused during subsequent visits (though probably not cached). Handstones, however, were highly shaped and probably used in a wide variety of contexts within and outside of the local region, and discarded locally after breakage. The generally low frequency of groundstone tools relative to flakedstone items is indicative of their economic significance during local site occupation. If agave processing was the norm, such activities did not require groundstone tools. That most were recycled as heating or cooking stones probably means that they were scavenged for such secondary uses, probably relating to roasting pit construction.

Table 4-15
Attribute Data for Groundstone Tools

Attribute		Handstones	Millingstones	Indeterminate Groundstone
Total		**12**	**8**	**3**
Condition	Whole	1	3	
	Margin	3	3	2
	End	4	1	
	Indeterminate	4	1	1
Metrics (mm) (average)	ML	72.23	256.56	96.24
	MW	56.97	156.01	66.20
	MTH	41.64	97.24	54.28

Table 4-15
Attribute Data for Groundstone Tools

Attribute		Handstones	Millingstones	Indeterminate Groundstone
Shaping Degree	None	2	3	1
	<30%	1	3	
	30-70%			
	>70%	6		1
	Indeterminate	3	2	1
Shaping Type	Pecked	3	2	1
	Ground	5	4	1
	Flaked			
	None/Indeterminate	6	4	1
Surface Frequency	1	7	5	2
	2	4	2	1
	3	1	1	
	4			
	Total # Surfaces	18	12	4
Surface Shape	Flat	14	8	2
	Basin		4	
	Convex	4		1
	Indeterminate			
Surface Texture	Regular/Smooth	17	12	2
	Irregular	1		1
	Indeterminate			
Surface Wear	Polished	12	12	3
	Striations	3	6	2
	Pecking	14	12	2
Secondary Modifications	End Blunted	2		
	End Polished	1		
	Battering	2		
	Anviling		1	
	Fire-Affected	4	5	
Material	Granitic	6	7	3
	Volcanic		1	
	Sandstone	2		


CAT: 265
Site: CA-SDI-21494
CAT: 264
Site: CA-SDI-21492
CAT: 269
Site: CA-SDI-21494
CM
DUDEK
8477-2-5
9.30.2014
FIGURE 4-30
Handstones
Jacumba Solar Energy Project: Cultural Resources Study

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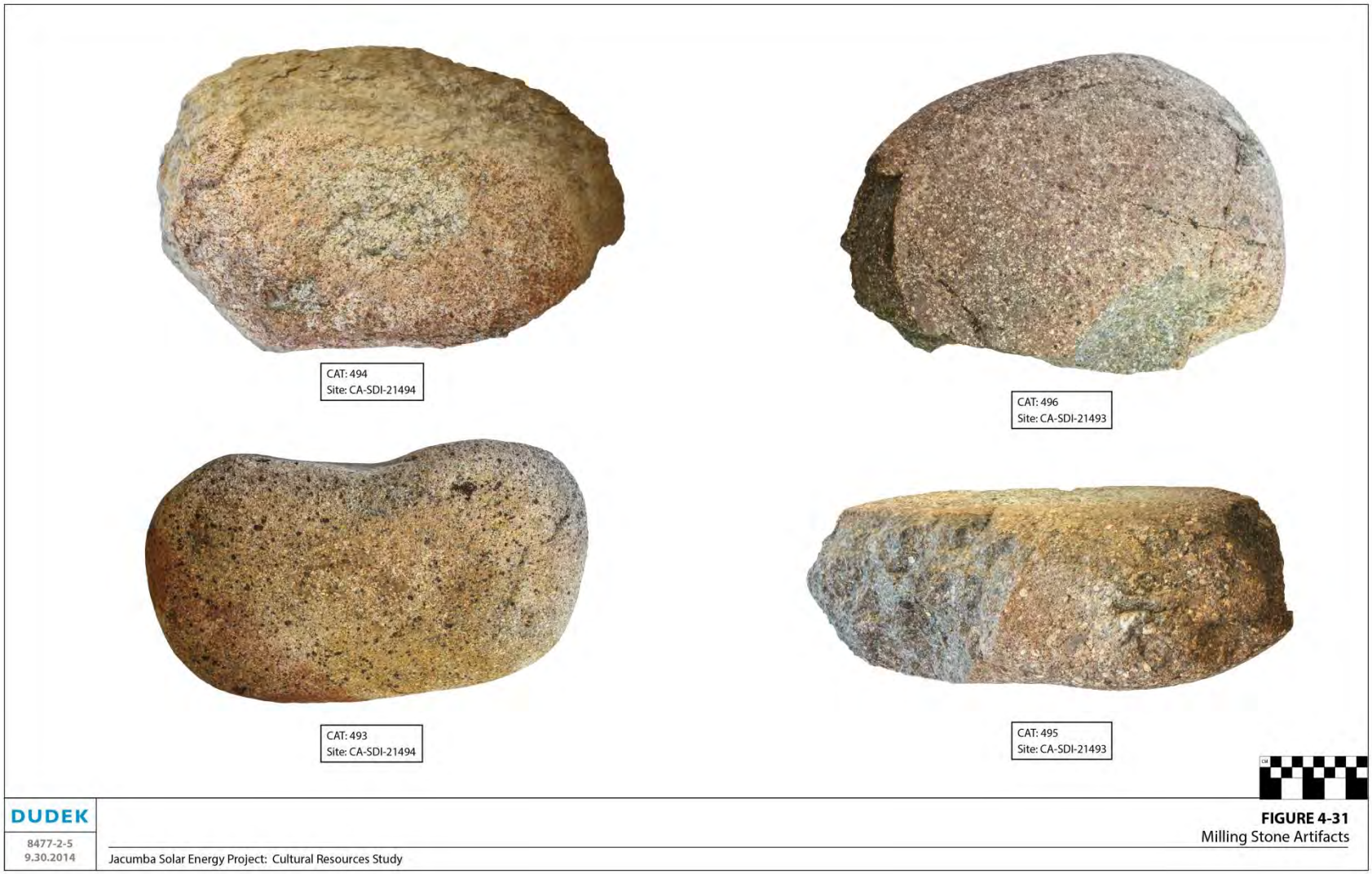

FIGURE 4-31
Milling Stone Artifacts

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Ceramic Analysis

A total of 106 ceramic sherds were recovered from the evaluation excavations. A basic macroscopic visual analysis was performed to differentiate the traditionally defined buffware and brownware, and to differentiate, when possible, Tizon Brown from Salton Brown, using the presence (Tizon) or absence (Salton) of amphibole (hornblende) as the distinguishing characteristic (Gallucci 2004). Differentiating between brownwares macroscopically is difficult at best, and even low-powered magnification has been shown to be much less accurate than microscopic analysis (Gallucci 2004; Hildebrand et al. 2002).

Of the 106 sherds, three are buffware and the remainder are brownware. No amphibole inclusions were identifiable in any of the specimens; however, since only a hand lens magnifying glass (10x magnification) was available for analysis at this time, it is not possible to definitely state that all of the specimens are Salton Brown. Under the more traditional classification, *i.e.*, not differentiating brownwares based on amphibole, all sherds in the assemblage would have fallen under Tizon Brown. As the site is located near the east-west transit corridor and is fairly close to presumed clay source locations for both, it is likely that each are represented in the collection.

Fifteen sherds have been fire-affected, indicating they were used for cooking; all are buffwares. A total of 10 rim sherds are present (two refit); all of which are also brownware. Analysis of the rim sherds indicated that there are four different rim and lip shape combinations (Table 4-16). As the direct rim, flattened lip type is present at more than one site, it can reasonably be assumed that those sherds represent more than one vessel, resulting in a minimum number of brownware vessels of six. The buffware sherds are also art different sites, quite a distance apart, and therefore it can be assumed at least two vessels are present.

Table 4-16
Ceramic Rim Sherd Type By Site

Rim Sherd Type	Sites	Quantity
Direct rim, Rounded Lip	CA-SDI-7074/6119/19627	3
Slightly Curved Rim, Rounded Lip	CA-SDI-21493	1
Direct Rim, Flattened Lip	CA-SDI-7074/6119/19627; CA-SDI-21493	3
Recurved Rim, Finely Flattened Lip	CA-SDI-21493	2

Four specimens exhibit additional modifications. Two brownware sherds, one from CA-SDI-21493 (Cat. no. 677) and one from CA-SDI-7074/6119/19627 (Cat. no. 679), have been ground on two edges into a squircle (rounded corners). Both specimens are rather small, so it isn't possible to determine the purpose of the grinding at this time. Both of the refit buffware sherds

recovered from CA-SDI-7074/6119/19627 (Cat. no. 258) have a white slip applied to the exterior surface, indicating they may be Colorado Buff. Lastly, one brownware sherd (Cat. no. 675) from site CA-SDI-21493 has been burnished on the exterior, and may have a remnant of a red slip.

Faunal Analysis

A total of 53 pieces of vertebrate remains (49.1 g) and four invertebrate remains (5.2 g) were recovered during excavation. Given the paucity of invertebrate remains, a detailed analysis cannot be performed. All four fragments are unmodified scallop shell (*Argopecten sp*.) and were recovered from STP 16 (CA-SDI-7074/6119/19627, Locus 2) from a depth of 10-20 cm. Scallops (*Argopecten sp*.) are found in salt water bays, indicating that either the shell was traded from coastal groups, or was transported during seasonal movements. While it represents the most exotic artifact/ecofact in the collection, the minimal quantity means little can be said about the remains.

Of the 53 specimens collected, 47 were recovered from site CA-SDI-21492, with the majority of those recovered from the floatation samples. This is to be expected, given that floatation utilized a much smaller mesh fabric, which allowed for the collection of significantly smaller items than those collected from the larger mesh dry-screening.

No evidence for modifications, such as cut marks, polish, and gnawing, could be identified on any of the specimens, although this may be as much a function of their small size, rather than an absence of such activities. Eleven specimens have been burned to varying degrees, all of which were recovered from the roasting pit feature at CA-SDI-21492.

Analysis of vertebrate remains did not identify any complete bone specimens – the entire assemblage is highly fragmentary. Excluding one modern large mammal (cow-sized) bone, only two specimens are larger than 2 cm, and only one contains diagnostic features which might identify it to the family level or better. Cat. no. 268, recovered from CA-SDI-7074/6119/19627, Locus 4, is likely a large mammal scapula, consistent with a deer-sized animal. Sixteen specimens are of general morphology consistent with small mammals (e.g., rodent), and one specimen, broken into multiple pieces, could be typed as bird; however, given that the bird bone is sun bleached, it is likely intrusive and non-cultural. All remaining specimens are too small to identify to any level. Although a few of the specimens have recent breaks, all of them were likely broken into quite small pieces prior to deposition.

Highly fragmentary faunal assemblages like this are typical throughout San Diego (Arter 2013; Arter and Roeder 2010). This generally results from processing and consumption practices, whereby small mammals were pounded and crushed with groundstone tools and consumed as a mix of meat, bone, and skin (Shipek 1991).

4.2.4 Cultural Resources in the Gen-Tie Corridor

One previously recorded archaeological site was identified within and overlapping the Project's gen-tie corridor. CA-SDI-19627 (now considered part of CA-SDI-7074/6119/19627) is a relatively large, diffuse artifact scatter consisting of low densities of flaked lithic debris, cores, and tools, aboriginal ceramic sherds, and a low frequency of other items, such as groundstone. Williams and Whitley (2011) evaluated portions of the site concluding that the tested portions did not contain archaeological deposits that could be considered eligible for listing in the NRHP or CRHR. No significant, buried archaeological deposits were identified during either evaluation of this site. However, two concentrations were identified by Williams and Whitley (2011) that were avoided during the associated undertaking. The potential eligibility of these two concentrations for listing in the NRHP or CRHR has not been determined. However, based on the results of previous evaluation efforts and current surface inspections, it is unlikely that significant archaeological deposits are contained in either concentration. The low-density scatter of artifacts in the remainer of the site contains approximately 1 artifact per 10 m, or the equivalent density of the "backround scatter" as determined through the distributional smapling.

4.2.5 Summary of Cultural Resources Investigations in the Jacumba Solar Project Area

The survey and evaluation program completed for the Jacumba Solar Project achieved avoidance of the Project parcel's sensitive archaeological resources through project design, and identified no significant archaeological deposits within the Project ADI. In all, 15 previously recorded archaeological sites and 4 newly recorded archaeological sites will be avoided through a formal Open Space Preserve. Within the ADI, previously recorded sites CA-SDI-7074/6119/19627, and CA-SDI-18765 and newly recorded archaeological sites CA-SDI-21492, CA-SDI-21493, CA-SDI-21494, CA-SDI-21496, and CA-SDI-21497 were subject to test excavations and no significant archaeological deposits were identified. (A portion of CA-SDI-7074/6119/19627 is located in the Project gen-tie alignment and was previously evaluated finding no significant deposits). Newly recorded potential prehistoric cremation areas CA-SDI-21495 and Locus 3 of CA-SDI-7074/6119/19627 have been avoided by project design changes.

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5.0 INTERPRETATION OF RESOURCE IMPORTANCE AND IMPACT IDENTIFICATION

This section summarizes the results and interpretation of the inventory and evaluation of cultural resources for the Jacumba Solar Project, provides eligibility recommendations for evaluated sites, and discusses potential impacts.

5.1 Resource Importance and Management Concerns

The current investigation identified and evaluated all cultural resources within the Jacumba Solar Project ADI, consisting of five prehistoric archaeological sites (CA-SDI-7074/6119/19627, CA-SDI-18675, CA-SDI-21492, CA-SDI-21493, and CA-SDI-21494) and two historic period refuse deposits (CA-SDI-21496 and CA-SDI-21497). An additional 18 prehistoric archaeological sites (some with minor historic period refuse scatters) and one historic period archaeological site are located outside of the Project ADI but within the Project parcel and these have been avoided by project design (CA-SDI-176, CA-SDI-4448, CA-SDI-4477, CA-SDI-7060, CA-SDI-7079/7080/7081, CA-SDI-20169, CA-SDI-20279, CA-SDI-20280, CA-SDI-20282, CA-SDI-20283, CA-SDI-20284, CA-SDI-20285, CA-SDI-20286, CA-SDI-20287, CA-SDI-20300, CA-SDI-21494, CA-SDI-21498, CA-SDI-21499, and CA-SDI-21500).

All cultural resources within the ADI have been evaluated for eligibility to the CRHR under CEQA Guidelines, as well as being evaluated for importance under the County Guidelines. While sites may be recommended as eligible or not eligible for listing on the CRHR, under the County Guidelines, all sites are considered "important." Although all sites are considered important under the County Guidelines, the "importance" of sites recommended as not eligible for listing on the CRHR can be exhausted through recordation, testing, the disposition of artifacts (if recovered [curation/repatriation]), and grading monitoring.

Evaluation of significance requires the development of an understanding of each identified resource in such a way that its historical significance can be assessed. CEQA mandates the consideration of the historical significance of a resource in an effort to gauge whether it has the potential to be listed on the CRHR. Criteria 1–4 of CEQA are a set of standards for determining the eligibility of a resource to be considered a historical resource eligible for listing on the CRHR. These criteria were discussed in Chapters 1.0 and 2.0.

The following eligibility recommendations are based primarily on Criterion 4 of CEQA for archaeological values, since the data generated during the evaluation program can be used to judge whether a particular cultural resource has yielded or may be likely to yield information important in prehistory or history. Data potential is represented by general archaeological characteristics—i.e., assemblage integrity, size, diversity, defined chronology, and the potential

for buried deposits. Neither of the two historic period sites contain any features, structures, or other constituents which could be used identify them through archival research. As such, no information was obtained that could be used to evaluate historic period refuse deposits, CA-SDI-21496 and CA-SDI-21497 under CEQA criteria 1-3.

Based on the results of the current investigation, all evaluated archaeological sites (or portions thereof) are recommended as not significant under CEQA, and as not eligible for listing in the CRHR or the local register. Archaeological site CA-SDI-21494 contains human remains and is therefore significant under the County RPO. A portion of CA-SDI-7074/6119/19627 also contians human remains; this portion of the site is significant under the County RPO. The remaining portion of CA-SDI-7074/6119/19627 and all other evaluated archaeological sites are recommended as not significant under the Coutny RPO. A portion of site CA-SDI-7074/6119/19629 located outside the ADI was previously evaluated and determined eligible for listing in the NRHP; therefore, the portions of the site within the ADI are non-contributing elements to the overall eligibility of the site. Individual site eligibility considerations are summarized below, after thematic considerations.

5.1.1 Integrity

Integrity is an important factor in the evaluation of historical resources. Integrity fundamentally affects associations that are critical for understanding behavioral relationships in site formation and design for prehistoric and historical archaeological sites. For the most part, evaluated prehistoric archaeological sites maintain good integrity, as the distribution of artifacts on the surface was generally good, with some areas more impacted by post depositional disturbance than others. CA-SDI-18675, the basalt knoll exploited as a prehistoric quarry, has been impacted by dirt road travel, extensive clearing of archaeological material on the south-facing slopes, and various other modern activities. However, these disturbances left untouched wide swaths of the quarry. Moreover, the deflated character of the basalt knoll precluded development of buried cultural deposits and ensured that flaked lithic material deposited on the surface was relatively unaffected by slope wash and other natural processes.

Of the non-quarry prehistoric sites, CA-SDI-21492 was identified during subsurface testing and a cluster of roasting pits at this location was preserved for more than 5,000 years beneath a thin, 10-40 cm layer of sand. Extensive testing of CA-SDI-21492 documented the prehistoric remains of roasting pits that, after use, reflect a typical discard pile of disorganized rock and charcoal-laden matrix. Thus, even though no clearly circumscribed feature was identified, loose concentrations of burned rock and ashy sediment indicate that the prehistoric signature of roasting pit use was relatively intact. Other prehistoric archaeological sites (CA-SDI-7074/6119/19627, CA-SDI-21493 and CA-SDI-21494) fared less well, these having artifacts confined to the top 10 cm of deposit. At these sites, vehicular travel within and near their

boundaries contributed to erosion and post depositional artifact displacement. Indeed, disturbed or destroyed roasting pits were found scattered about the surface within CA-SDI-21494 and CA-SDI-7074/6119/19627. These destroyed features have very little scientific value since the distribution of materials precludes sampling for radiocarbon determinations or other special studies, save for one radiocarbon date of post AD 1665 from a roasting pit at Locus 2 of CA-SDI-7074/6119/19627. Overall, the lack of buried deposits at prehistoric archaeological sites (even CA-SDI-21492 produced trace amounts of non-charcoal/FAR artifacts) reduces the opportunity for drawing more meaningful or data-laden associations between assemblage constituents, despite relatively strong integrity overall of surface manifestations. Thus, integrity alone is not a determining factor when deciding historical significance of an archaeological resource.

Turning to historic period refuse deposits (CA-SDI-21496 and CA-SDI-21497), these sites had very little integrity with artifacts found distributed over large areas away from their focal point of deposition due to natural processes. The linear site boundaries for both of these sites tend to follow natural terrain contours revealing cans and other items have been transported downslope since their time of deposition. Bullet holes and shattered glass also attest to more direct disturbance through modern target practice, intentionally destroying and displacing artifacts. Neither refuse deposit has a buried component; all artifacts are located on the surface or within 5 cm of it. The overall low density of historic artifacts makes it even more difficult to identify the original point of deposition for these single-episode dumps. Considering the lack of historical archival records for the area to draw even tenuous associations with local inhabitants, and with little important data otherwise, the lack of spatial integrity at historic period refuse deposits is a strong signal precluding the consideration of these resources as historically significant.

5.1.2 Chronology

With strong integrity of archaeological deposits, chronological associations can add much value to archaeological interpretation. For this reason, archaeological sites that yield chronological information are typically held in higher scientific value. It is not uncommon for topical evaluations of prehistoric sites to conclude that a particular deposit could be considered significant because of the presence of time-sensitive artifacts or the presence of archaeological deposits that carry the promise of producing radiocarbon dates. Truthfully, the rarity of intact, datable archaeological deposits has somewhat inflated the importance of chronological data when evaluating the historical significance of an archaeological site. Such deposits are critical to evaluation efforts; however, the ability to place a resource in time should not itself qualify the resource as significant.

Chronological information at evaluated prehistoric sites for the current Project was also somewhat rare. Only one Desert Side-Notch arrow point (made from Obsidian Buttes obsidian)

was recovered from Locus 3 of CA-SDI-7074/6119/19627. This arrow point was identified near a scatter of human cremated bone and no obsidian studies were completed on the specimen. These arrow point forms tend to post-date AD 500 in the San Diego and Imperial County regions (Hale 2009). Very few solid radiocarbon dates have been obtained in the region to refine the local chronology of any arrow point forms, however radical increases in their assemblage frequency suggests that they became economically significant after about AD 900 (Hale 2009). Such a date is consistent with the availability of Obsidian Buttes source after 940 BC (Schmitt et al. 2013).

Tizon Brownware is the predominant aboriginal ceramic type with insignificant frequencies of buffware from Imperial Valley. These types of ceramics are generally thought to be Late Prehistoric period time markers, although the wide time span marking the availability of these artifacts in the southern California and Baja Mexico regions reduces their ability to refine site-specific chronology. At best, these ceramics are thought to have been in use in the region after about AD 0, and became an economically significant aspect of the hunter-gatherer toolkit in southern San Diego and Imperial Counties sometime after AD 500 (Griset 1996, Schaefer et al. 1998; see also Hale 2009). Large amounts of ceramic sherds are common after approximately AD 1400, associated locally with the Cuyamaca Complex (see Hector 1986). Their commonality in the local vicinity of the Project probably attests to a Late Prehistoric fluorescence of occupation; however, it could simply indicate that pottery was employed later in time for cooking and storage to draw more energy out of already intensive use of local resources.

Direct chronological evidence indicates widely disparate occupations. CA-SDI-21492 had a series of radiocarbon dates collected from five overlapping roasting pit features that produced a relatively tight age range of 3550-3000 BC (5,600-5,050 BP). Another series of radiocarbon dates from an excavated roasting pit at Locus 2 of CA-SDI-7074/6119/19627 measured AD 1665 to the present (285 BP-present). Notwithstanding the radiocarbon error in the late end of the time span, the feature appears to date to just before or after the Spanish Mission period. Radiocarbon dates of this age not rare in the region, and are locally common with similar dates retrieved from roasting pits evaluated at the CA-SDI-7074 portion of the site for the ECO Substation project located just to the northeast of the Jacumba Solar Project.

Overall, age estimates for Project sites based on time-sensitive artifacts (projectile point and ceramic sherds) and radiocarbon dates from roasting pits fit squarely within established chronological schemes for the region; none are capable of refining local prehistoric patterns. From just the ECO substation project alone, 26 radiocarbon dates from roasting pits range from nearly 7780 BC (9730 BP) years ago until contact times (Williams et al. 2014b). While roasting pit structure showed some variability (mostly whether it was used or abandoned in use), these features tend to lack artifacts and other non-charcoal/FAR assemblage constituents

such as those evaluated in the Project area. Variability exhibited in the ECO Substation features fully encompasses that of the Project features. Thus, despite the success in obtaining radiocarbon dates from Project features, the dates do not represent a significant contribution to local or regional prehistoric patterns; instead chronological and assemblage data from Project features are redundant.

Chronological information for historic period archaeological sites CA-SDI-21496 and CA-SDI-21497 is derived from maker's marks on glass bottles and can typologies. Chronological placement of CA-SDI-21496 is based on Hazel-Atlas Glass Company maker's mark with the "H over an A" logo dating from 1902 to 1964 and Glass Containers Inc. used the interlocking G-C logo after 1945 (Toulouse 1971). Another glass artifact from CA-SDI-21496 has a cursive Duraglas logo that was used by the Owens Illinois Glass Company from 1941-1963. The 1905 Indian Head penny provides an earlier date, but currency is generally thought to be a poor time marker since it is highly curated and rarely discarded. Given the location of the coin within the refuse deposit, it was likely lost during refuse disposal much later than its 1905 manufacture date. Assemblage information for CA-SDI-21497 is confined mostly to cans representing domestic consumables such as food and beverages. No precise dates can be identified from the refuse but an estimated date range of 1917-1929 is likely based on the hole-in-top cans (Simonis n.d.). Representing a single dump episode, this site cannot be linked to any specific plot of land or individual, or any specific historic period land use.

Historic period refuse deposits typically contain large amounts of artifacts that can be ascribed to a date of manufacture which is presumably close to the date of consumption and the ability to date such items at Project sites is thus not unique. While the age of manufacture and possible consumption of goods is somewhat discernable, the date of deposition for each site is complicated by the fact that disposal of domestic refuse often occurred far away from the point of consumption, especially after the advent of the automobile when homesite cleanup efforts intensified and often combined materials of different ages into a single load dumped at a remote locale (Hale et al. 2010). Thus, the age ranges of artifacts at CA-SDI-21496 and CA-SDI-21497 add little to the understanding of local historic period land use and are by no means unique in association with assemblage constituents.

5.1.3 Settlement and Site Function: Lithic Quarrying and Roasting Pits

As with any archaeological evaluation, research issues postulated in advance of fieldwork have mixed success in their applicability to the recovered assemblage, particularly in terms of the kinds of data that could be generated and attendant questions that can be addressed. Several major settlement and subsistence questions can be addressed from the Jacumba Solar Project, however, and these are based primarily on flakedstone and roasting pit studies. Certainly, these are the two most robust kinds of archaeological information available in the greater region and it

is not altogether surprising that the current evaluation effort produced essentially no faunal remains, and meager amounts of formed tools.

Lithic Quarrying

Considering lithic quarrying first, the prehistoric assemblage from the current project sites is dominated by lithic reduction debris (i.e., debitage and cores) with modest amounts of crude flakedstone tools (i.e., chopping/pounding core and flake tools). Within the Project ADI, CA-SDI-18675 is prehistoric stone quarry that essentially encompasses a deflated outcrop of basalt characterized by a low knoll covering the southwestern third of the Project ADI. This basalt landform is distinguishable from the surrounding colluvial sands visually by topography and color—the basalt taking on a patinated orange-brown tone distinct from the tan granitic sands that surround it. The current evaluation completed a distributional sample of the quarry and surrounding area within the ADI, and resulted in the collection of a robust sample of flaked lithic debris from all parts of the basalt exposure. Standard and subjective sample units were targeted to ensure redundant characterization of the lithic quarry.

The evaluation program resulted in the conclusion that the basalt knoll was targeted for an unknown period of time by aboriginal occupants who opportunistically took basalt cobbles from the deflated surface, split them to assay quality, and sometimes further reduced cobbles and flakes into cobble or flake-based tools, though not to any great degree. The analysis of debitage for this Project confirms this assertion, with large amounts of cortical and early interior debitage, and only trace amounts of debitage that could have resulted from tool edge finishing, including late interior, biface thinning, and pressure flakes. Non-quarry sites (CA-SDI-7074/6119/19627, CA-SDI-21492, CA-SDI-21493, and CA-SDI-21494) actually show a similar profile, indicating that, although the quarry included the full range of flake types and sizes, non-quarry sites did not have higher proportions of later-stage debitage that would indicate either distance-decay of stone (i.e., less mass farther from the quarry) or selective use of particular flake types. Rather, lithic artifacts at the quarry and in non-quarry contexts indicate a similar use of the stone.

The stone tool analysis indicates that discernable stone tools are dominated by unmodified flakes (simple flake tools) and minimally retouched flakes; formed flake tools are not a significant component of the toolkit. Add to this the crude cobble tools used for chopping and a picture emerges of a lithic toolkit intended for immediate local use for chopping and scraping, probably of agave leaves and roots. There is no evidence to indicate that basalt cobbles at the quarry were being reduced for the transport of raw material masses to other areas for the further manufacture of smaller, more finished stone tools.

The pattern of minimal investment in lithic tools is not unique to evaluated Project sites. Williams et al. (2014a) updated the Jacumba Valley Archaeological District (JVAD) through

intensive micro-mapping and analysis of surface artifacts in an area to the west and north of the Jacumba Solar Project area. They identified a very similar pattern of lithic reduction, including more expansive exposures of naturally occurring basalt. Likewise, lithic artifacts recovered during data recovery at CA-SDI-7074 for the ECO Substation project are also similar in kind and frequency to those recovered from the current Project sites; the debitage assemblage there was characterized by approximately 33.7% cortical debitage (Williams et al. 2014b) which is essentially the same as that identified for the current Project (32.4% cortical flakes). Also, retouched flakes accounted for 67% of flakedstone tools identified at CA-SDI-7074 at ECO Substation, which is equal to the proportion of retouched flakes in the Jacumba Solar assemblage (67%). There are differences between the CA-SDI-7074 and Jacumba Solar site assemblages; CA-SDI-7074 showed more evidence of habitation including faunal remains, midden soils, and more diverse lithic raw material (i.e., chert, wonderstone; both deriving from off-site contexts) (see Williams et al. 2014a, b). Despite these differences, evidence from the ECO Substation Project and JVAD update reflect a pattern of opportunistic lithic quarrying geared toward producing tools intended for immediate, local use. Indeed, CA-SDI-7074 was characterized as a specialized plant processing center within the JVAD that is the best example of its kind.

In context of immediately local archaeological studies, the Jacumba Solar prehistoric site evaluations did not result in the identification of any new archaeological patterns, but confirmed an existing understanding of local lithic reduction. That more variety is seen in adjacent areas is probably due to more regular aboriginal occupation of those areas due to increased availability of both stone and vegetal resources, resulting in more frequent exposure to the discard of exhausted tools made from extralocal materials or of those used in more varied contexts (i.e., chert and formed flakedstone tools). The presence of a basalt outcrop within the Project ADI is also not unique; the JVAD documented extensive exposures of quarried basalt cobbles either within the colluvial sediments or at other exposures themselves. In fact, the low basalt knoll within the ADI pales in topographic comparison to the basalt mountain (Airport Mesa) abutting the western Jacumba Solar Project boundary.

Roasting Pits

Evaluation of Jacumba Solar prehistoric sites resulted in the excavation of three areas containing roasting pit features. As many as five overlapping and expended roasting pits were identified at CA-SDI-21492, and one each at Locus 3 and Locus 4 of CA-SDI-7074/6119/19627. The cluster of roasting pits at CA-SDI-21492 had radiocarbon dates clustering at a midrange of about 5,300 years BP and the single feature at CA-SDI-7074/6119/19627 dated to the last 400 years. Dateable material was not obtained from the feature at Locus 4 of CA-SDI-7074/6119/19627. The features generally consisted primarily of large amounts of FAR and charcoal-infused matrix, but generally lacked other kinds of artifacts or midden constituents such as animal bone. These

features and the analysis of them is typical of the hundreds of roasting pits tested and analyzed at CA-SDI-7074 (Williams et al. 2014b). Despite exhaustive special studies, the CA-SDI-7074 ECO Substation feature assemblage produced minimal amounts of plant material, indicating the features were primarily used for agave and cactus processing. While it is possible that these roasting pits were also used to process other foods, the focus on agave and cactus is not surprising and is consistent with ethnohistoric accounts (see Schaefer et al. 2014 and Shackley 1983). Analysis of heavy and light fractions from sediments processed through flotation on the Jacumba Solar Project identified a very small collection of lithic debitage (which was included in the debitage analysis presented in Chapter 4). The light fractions produced a moderate amount of charcoal pieces, but failed to produce identifiable seeds or vegetation remains which could help determine what was cooked in the pits.

Based on the identification of hundreds of roasting pits from the surface to below 20 feet in depth at the ECO Substation project, the current evaluation effort included extensive backhoe trenching within and between artifact concentrations in the Project ADI to look for buried roasting pits and other features. Despite these efforts, backhoe trenching proved useful only in delineating features already identified. Moreover, analysis of the geologic context of the Jacumba Solar Project ADI makes it unlikely that large numbers of roasting pits will be discovered during earth moving. From these considerations, it does not appear that the Project ADI encapsulates the same kind of archaeological deposit identified at CA-SDI-7074 on the ECO Substation project.

The research design identified a potential to analyze the relationship between roasting pits and artifacts, specifically related to the Jacumba Solar Project's potential to address the relationship between roasting pit plant processing and exploitation of local lithic raw material. Specifically, Schaefer et al. (2014) and Williams et al. (2014b) did not fully explore whether local basalt cobbles were reduced to manufacture stone tools used in chopping or scraping yucca or agave plants in preparation for roasting. Part of this inquiry is pending the analysis of plant residues on flaked lithic tools recovered near roasting pits on the Jacumba Solar Project. However, the overall lack of tools within roasting pits is consistent with the results from the ECO Substation project (CA-SDI-7074).

On the Jacumba Solar Project, some artifacts were recovered near the features at CA-SDI-21492, including a drill, a formed flake tool, and a retouched flake. All of these items are relatively crude with the exception that the formed flake tool has a heavily modified scraping edge (though it is still a large scraping tool). The direct deposition of these artifacts within the feature context indirectly suggests that they were used in some fashion for the processing of plant foods prior to roasting.

Alternatively, since ethnohistoric accounts indicate agave processing, for example, was initially accomplished by digging out the root and pulverizing it along with the leaves

(Schaefer et al. 2014), it can be expected that extraction and pulverization tools are not likely to make it into the archaeological record of a roasting pit, but would be more common at the extraction site. On a landform repeatedly occupied for agave exploitation and with abundant local raw material for making simple extraction tools, overlap in roasting pits and artifacts discarded from previous extraction events is likely to have occurred, comingling roasting pit deposits with unassociated artifacts. There would be little reason to carry a heavy cobble or flake tool, along with the plant remains to the roasting pit location (no matter the distance), but the cheaply made tool is more likely to have been simply dropped at the extraction site. This explanation best fits the robust pattern that roasting pits tend to lack artifacts. Thus, for the current Project, the recovery of three tools within feature deposits cannot be automatically assumed to represent a functional relationship.

Overall, the two areas with roasting pits in the Jacumba Solar Project ADI provide little more than confirmation of the archaeological pattern already identified by previous research in the immediate local vicinity. Considering lithic quarrying and roasting pits together, a parsimonious explanation of aboriginal settlement and subsistence of the local area would be that hunter-gatherers traversing the region intentionally made use of the locally abundant basalt and plant resources. Exploitation of these resources could have been seasonally stable or transient, and probably was a mixture of both. However, the low frequencies of artifacts deriving from Imperial Valley, such as exotic stone, exhausted tools, or buffware pottery suggests that the local area was inhabited by populations centered within the Peninsular Ranges or eastern coastal plain to the west. Extensive travel to the Jacumba area from Imperial Valley would have resulted in deposition of artifacts from Imperial Valley in more noticeable quantities. Certainly, the predominance of Tizon Brownware pottery indicates a strong local population, whereas Imperial Valley and Colorado Desert buffware ceramics in large quantities would indicate otherwise, or at least regular use of the area by local and extralocal groups.

Finally, no substantial or long term habitation is implied in the Project assemblage or from those deriving from JVAD or ECO Substation projects. Some midden deposits in areas external to the Jacumba Solar Project ADI, such as two small middens at CA-SDI-176 imply that some prolonged habitation did occur. However, these kinds of deposits are more common in the area of the town of Jacumba several miles to the west of the Project area. Rather, local settlement appears task specific and narrow in scope but with those tasks embedded in an overall settlement and subsistence agenda.

5.1.4 Regional Comparison

A broader perspective on assemblage composition in comparison to other quarry sites shows little variability until coastal cobble quarries are included. For this comparison, only flaked and ground stone tools are included, comparing the Jacumba Solar assemblage as a whole to the

assemblages from CA-SDI-7074 at ECO Substation, CA-SDI-12,809 from Otay Mesa directly west of Project area near the coast, and CA-SDI-10,723 from the Las Pulgas mesa some 180 km to the northwest. CA-SDI-7074 contains basalt and metavolcanic cobbles as float material in the colluvial and alluvial deposits. The Otay Mesa quarry consists of fine grained metavolcanic and volcanic stone outcropping as cobbles on mesa tops and in drainages. The Las Pulgas site is a metavolcanic and volcanic quarry with rounded beach cobbles eroding out of ancient marine terrace deposits on a coastal bluff. The Las Pulgas quarry is distinctly different in available material and quarry deposits; the stone is coarse-grained and very hard and occurs only as rounded beach cobbles. While different, it is included for comparison to show the similarity of quarries to the south. The age ranges for each of these samples is provided in Table 5-1.

Stone artifact frequencies are provided for each of these samples, and these are used to calculate the Simpson diversity index value, and evenness as an approximation of assemblage content. Ceramic sherds are excluded because quantifying ceramic use through sherd frequencies is more problematic than for fractured stone tools (how many sherds make a whole artifact?). Other artifact classes are excluded since they are represented only in trace frequencies. The Simpson diversity index for stone tool assemblages can be calculated as the inversed sum of the squared proportions for each artifact class relative to the total stone tool assemblage. Evenness is simply the spread of artifact frequencies over each artifact class, calculated as the Simpson's index divided by the total number of artifact classes.

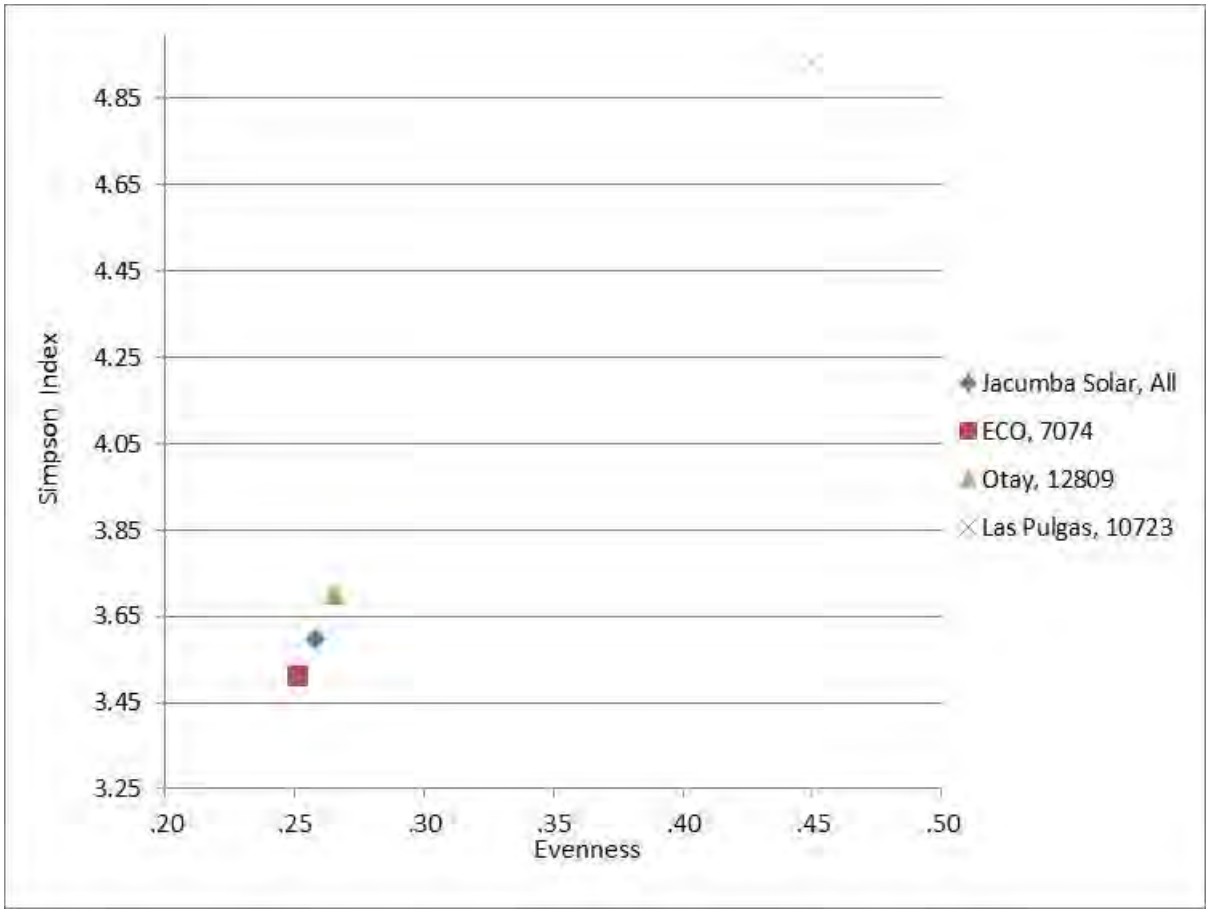
Table 5-1
Regional Stone Tool Comparison

	Jacumba Solar 3550 BC-AD 1800	ECO CA-SDI-7074 7750 BC-AD 1800	Otay Mesa CA-SDI-12809 AD 1000-1700	Las Pulgas CA-SDI-10723 AD 1260-1520
Arrow Points	1	0	16	13
Darts	0	1	0	0
Point Preforms/ Frag	0	0	21	2
Biface	2	8	116	17
Formed Flake Tool	2	2	17	0
Retouched Flake	50	97	0	110
Simple Flake Tool	19	7	20	8
Cobble Tool	1	18	8	29
Heavy Scraper	0	0	0	31
Hammerstone	10	12	13	25
Mortars	0	0	0	0
Pestles	0	0	2	0
Millingstones	10	46	4	15
Handstones	13	18	24	91
Total Stone Tools	**108**	**209**	**241**	**341**

Table 5-1
Regional Stone Tool Comparison

	Jacumba Solar 3550 BC-AD 1800	ECO CA-SDI-7074 7750 BC-AD 1800	Otay Mesa CA-SDI-12809 AD 1000-1700	Las Pulgas CA-SDI-10723 AD 1260-1520
Simpson's Diversity Index	*3.60*	*3.51*	*3.71*	*4.94*
Evenness	*.257*	*.251*	*.265*	*.449*

Figure 5-1 Regional Assemblage Comparison for Simpson's Diversity Index by Evenness



Simpson's index and evenness values clearly show that assemblage diversity is relatively similar among the Jacumba Solar and ECO Substation assemblages (see Figure 5-1). This similarity is not unexpected, given that they are located in close proximity to one another and essentially share access to abundant lithic raw material. What is surprising is the overall lack of other tool classes that would have increased assemblage diversity. It can be assumed that the intensive or

serial habitation of the ECO Substation site would have resulted in the discard of a wider variety of stone tools. However, the analysis from CA-SDI-7074 characterized the whole site as a limited activity locale that saw intensive occupation but that it was limited in scope to vegetal extraction and roasting (Williams et al. 2014b). Therefore, assemblage similarity between the Jacumba Solar Project assemblage and CA-SDI-7074 is due to simply less regular or less intensive occupation of Jacumba Solar Project sites, rather than occupation for different reasons.

More surprising is the similarity in assemblage diversity and evenness with the quarry assemblage from Otay Mesa. Located near the southern San Diego coastline, the Otay Mesa quarry site is situated in an area that likely saw intensive quarrying for much of the Holocene (McDonald et al. 1993). The raw material there consists of relatively high quality fine-grained volcanic material that would have been suitable for the production of finished flakedstone tools. Indeed, bifaces at the Otay Mesa site are common and are mostly items rejected in the arrow point production process (a fact supported by the debitage analysis for that site) (see McDonald et al. 1993). Despite the overrepresentation of bifaces and arrow points, assemblage diversity and evenness are quite low, similar to the Jacumba Solar Project assemblage.

Finally, the Las Pulgas site (CA-SDI-10723) is much more diverse and even that any of the three previous samples, including the Jacumba Solar Project assemblage. The Las Pulgas site was the location of a robust seasonal habitation that appeared to narrowly focus on seasonally abundant *Donax spp.* (bean clam) exploitation, as well as intensive seed processing. The increased diversity of this assemblage is likely due to the fact that it was a seasonal habitation rather than a resource extraction site. That is, it wasn't simply the focal point of lithic quarrying or vegetal roasting but it supported many different economic pursuits, and tools used in off-site contexts were discarded there. Sifting through these layers, the Las Pulgas site was a major volcanic cobble quarry that was used for the production of expedient flake and cobble-based tools. What is not presented here is that the debitage assemblage at the Las Pulgas site virtually lacks evidence of flakedstone tool finishing, similar to both Jacumba Solar and ECO Substation assemblages (Hale and Becker 2006).

This regional comparison of stone tool assemblages shows that the Jacumba Solar Project prehistoric assemblage is not unique, but is characteristic of an overall southern California lithic reduction strategy based on situational cobble-core reduction, rather than prepared core and biface production. Biface reduction only becomes economically significant after the introduction of the bow and arrow and, as the Otay Mesa assemblage demonstrates, little else changes in the overall toolkit other than the addition of arrow points (Hale 2009, 2010). Moreover, the ECO Substation assemblage is also characteristic of long standing patterns of resource exploitation that varied little throughout the Holocene (see Williams et al. 2014b). Variability in southern California assemblages is observable at the broad regional level, such

as with the Las Pulgas comparison, but this variability simply represents similar approaches to different kinds of resources; investment in tool manufacture is low for much of the last 10,000 years (Hale 2010; Hale and Comeau 2010).

5.2 Resource Importance and Evaluation of Tested Sites

Evaluated sites CA-SDI-18765, CA-SDI-21492, CA-SDI-21493, CA-SDI-21494, CA-SDI-21496, and CA-SDI-21497 are recommended as not significant, and not eligible for listing in the CRHR, or local register based on CEQA Criterion 4, and based on County Significance Guidelines. The portion of site CA-SDI-7074/6119/19627 within the ECO Substation ADI was previously determined to be eligible for listing in the NRHP and CRHR (Williams and Whitley 2011). The portions of the site within the current ADI were evaluated during the current study and are recommended not eligible for listing in the CRHR, or local register based on CEQA Criterion 4, and based on County Significance Guidelines. These portions of the site are therefore recommended as non-contributing elements to the overall eligibility of the resource. All sites are also recommended as not eligible for listing in the CRHR based on Criteria 1-3, as no site constituents are present which could connect the site through archival research to historically important persons or events, nor does the site embody distinctive characteristics of a type, period, region, or method of construction, or represent the work if an important individual, nor possess high artistic value. However, under the County guidelines all sites are considered "important." Although all sites are considered important under the County Guidelines the "importance" of the sites recommended as not eligible for listing in the CRHR will be considered mitigated through testing, documentation, disposition of archaeological materials (curation/repatriation), and archaeological monitoring of initial ground disturbance for the entire project area.

5.2.1 Evaluation of CA-SDI-7074/6119/19627

Site CA-SDI-6119 is large, diffuse artifact scatter characterized by low densities of flaked lithic debris deriving from locally available stone (i.e., debitage, cores, simple flake tools, and cobble tools), and small amounts of groundstone and ceramic sherds. A few roasting pits, consisting of burned rock and charcoal are located within the site limits. The site has been subject to archaeological evaluation during previous investigations. Jordan (2010) tested the site in association with SDG&E's ESJ gen-tie project, also finding the site not significant. This portion of the site marginally overlaps the northern boundary of the Project ADI, and this portion was subject to evaluation for the Jacumba Solar Project. Four loci were identified, none of which contained significant archaeological deposits, and all are recommended as not significant, and therefore non-contributing elements to the overall eligibility of the site. However, fragments of burned bone were identified in Locus 3 of the site, prompting a change in Project design to achieve avoidance of impacts to the area containing human remains. The portion of the site that

contained the human remains is considered both CEQA and RPO significant. As such, this portion of the site will be dedicated into open space.

Williams and Whitley (2011) evaluated two portions of the site for SDG&E's ECO Substation project. The portion previously recorded as CA-SDI-19627 was found to lack significant deposits, but did identify two concentrations that were located outside of the ECO Substation project area which were not evaluated. Currently, the Jacumba Solar Project gen-tie corridor traverses the portion of the site Williams and Whitley (2011) evaluated as not significant/not eligible, as well as a portion of the site which was not evaluated at that time. That portion of the site consists of a light density artifact scatter (1 per 10 m), which is equivalent to the general background scatter delineated during the distributional sampling, and did not require further evaluation. As CA-SDI-19627 was determined to be not significant/not eligible prior to it being subsumed into CA-SDI-7074, this portion of the site is therefore recommended as being a non-contriuting element to the overall significance/eligibility of the site. No additional archaeological testing within the gen-tie corridor was necessary for the Jacumba Solar Project to determine that construction of the gen-tie would not have a significant impact on that portion of the site.

CA-SDI-7074 was recorded as a temporary camp/resource processing site with an abundance of roasting pits and a sparse artifact scatter; the portion of the site within the ECO Substation ADI was determined eligible for listing in the NRHP and CRHR by Williams and Whitley (2011) prior to the unification with CA-SDI-6119/19627. The remaining portion of the site outside the ECO Substation ADI (e.g., to the north) was not formally evaluated, but is presumed significant.

No additional information can be gleaned from the impacted areas of CA-SDI-7074/6119/19627 because of the assemblage's limited diversity and low density of artifacts. For these reasons, this portion of the site is not considered historically significant, it is not eligible for listing in the CRHR or local register, and it possesses no attributes that would make it significant under the County RPO. As the overall site has been determined eligible for listing in the NRHP and CRHR, the portions of the site evaluated at this time are recommended as non-contributing elements to the overall eligibility of the site. Under the County's guidelines for determining significance, the site is considered important. Significant impacts to the site are considered mitigated through the current evaluation effort, curation of collected materials, documentation, and archaeological monitoring of initial ground disturbance during construction for the entire project area to control for unanticipated discoveries.

5.2.2 Evaluation of CA-SDI-18765

CA-SDI-18675 is a prehistoric lithic quarry located within the Project ADI. A small portion of the site was previously evaluated by Rosenberg and Smith (2008), who found no significant deposits resulting in a recommendation that the tested portion of the site was not significant and

not eligible for listing in the CRHR or local register. The current evaluation conducted intensive regular interval sampling of the lithic quarry resulting in the recovery of a large, redundant assemblage for lithic reduction debris and flakedstone tools. No buried deposits were identified; all artifacts were found to be concentrated on the surface. Data generated from evaluation of CA-SDI-18675 were compared to other local samples and regional assemblages and found to provide only redundant data in terms of local prehistoric archaeological patterns, and that the site does not represent the best example of its kind, either locally or regionally.

No additional information can be gleaned from the site because of the assemblage's limited diversity and because data generated from the assemblage do not vary from other, more robust local assemblages reflecting lithic quarrying behavior. For these reasons, this site is not considered historically significant, it is recommended as not eligible for listing in the CRHR or local register, and it possesses no attributes that would make it significant under the County RPO. Under the County's guidelines for determining significance, the site is considered important. Significant impacts to the site are considered mitigated through the current evaluation effort, curation of collected materials, documentation, and archaeological monitoring of initial ground disturbance during construction for the entire project area to control for unanticipated discoveries.

5.2.3 Evaluation of CA-SDI-21492

CA-SDI-21492 is a small prehistoric site consisting of approximately five overlapping, expended roasting pits buried between 10 and 40 cm below the surface. Constituents include large amounts of FAR and charcoal-infused sediments with small amounts of flakedstone debitage, three flakedstone tools, and a few pieces of groundstone. The cluster of features represents a limited activity locale focused on roasting plant foods and materials in earth ovens. Extensive archaeological excavation, consisting of several units and four backhoe trenches failed to identify buried archaeological deposits other than feature matrix. Flotation samples were taken and processed, failing to identify significant amounts of paleoethnobotanical remains, but enough material was recovered to produce five radiocarbon dates of 3550-3050 BC. This age range is well represented in the region and was duplicated multiple times over in the nearby mitigation of CA-SDI-7074 for the ECO Substation project.

No additional information can be gleaned from the site because of the assemblage's limited diversity and general lack of artifacts. For these reasons, this site is not considered historically significant, it is not eligible for listing in the CRHR or local register, and it possesses no attributes that would make it significant under the County RPO. Under the County's guidelines for determining significance, the site is considered important. Significant impacts to the site are considered mitigated through the current evaluation effort, curation of collected materials, documentation, and archaeological monitoring of initial ground disturbance during construction for the entire project area to control for unanticipated discoveries.

5.2.4 Evaluation of CA-SDI-21493

CA-SDI-21493 is a small prehistoric site consisting of a small amount of flakedstone debitage, 60 pieces of aboriginal ceramic sherds, and two millingstones concentrated in a small area. One disturbed thermal feature was identified on the surface, although its origin was not discernable due to the lack of integrity. Surface collection and excavation failed to identify substantial archaeological deposits on the surface or below the surface. The small area within which artifacts were located suggests that this site is a single episode temporary camp that witnessed the production of expedient stone tools for local resource extraction, along with the possibility of some small seed processing given the presence of two millingstone fragments. The ceramic sherds do not comprise a whole vessel, small or large, and are probably what remains of three pots. These kinds of artifacts comprise the most common assemblage constituents of other local archaeological sites and are not unique, individually or as an assemblage.

No additional information can be gleaned from the site because of the assemblage's limited content and diversity. For these reasons, this site is not considered historically significant, it is not eligible for listing in the CRHR or local register, and it possesses no attributes that would make it significant under the County RPO. Under the County's guidelines for determining significance, the site is considered important. Significant impacts to the site are considered mitigated through the current evaluation effort, curation of recovered materials, documentation, and archaeological monitoring of initial ground disturbance during construction for the entire project area to control for unanticipated discoveries.

5.2.5 Evaluation of CA-SDI-21494

CA-SDI-21494 is a small, dense accumulation of prehistoric artifacts, including flakedstone tools and debitage, a small number of groundstone tools, and ceramic sherds. A disturbed roasting pit is located within the site limits, although it lacked sufficient integrity to warrant a radiocarbon assay. Extensive surface collection and excavation failed to identify substantial or significant buried archaeological deposits; all artifacts were confined to surface and near surface contexts. Despite its small size, several different kinds of tools were identified including one biface, a few flake tools and a few pieces of groundstone, suggesting that several different kinds of economic activities occurred at the site beyond simple extraction and roasting of agave which characterizes all other prehistoric sites. Alternatively, the few other tools recovered from this site may have simply been discarded at the site while processing agave. No information was obtained to resolve more detailed questions about site occupation or subsistence beyond what has already been presented.

No additional information can be gleaned from the site because of the assemblage's compromised integrity and limited size. For these reasons, this site is not considered historically significant, it is not eligible for listing in the CRHR or local register, and it possesses no attributes that would make it significant under the County RPO. Under the County's guidelines

for determining significance, the site is considered important. Significant impacts to the site are considered mitigated through the current evaluation effort, curation of recovered materials, documentation, and archaeological monitoring of initial ground disturbance during construction for the entire project area to control for unanticipated discoveries.

5.2.6 Evaluation of CA-SDI-21496

CA-SDI-21496 is a diffuse historic period refuse deposit consisting mostly of glass fragments and cans, but also including other domestic refuse such as small amounts of miscellaneous milled lumber, metal, and non-diagnostic automobile parts, among other items. Maker's marks on some artifacts indicate mostly post 1930s manufacturing age with some that were made during a wider range of time, such as certain Owens Illinois maker's marks that spanned much of the first 60 years of the 20th Century. The overall manufacturing range for artifacts from this site spans the period from 1908 to 1963. However some artifacts manufactured after 1943 indicate that consumption and deposition of this refuse occurred after 1943. A few wood fenceposts with remnants of barbed wire suggest some kind of holding pen once stood at the site, but its age is indeterminate from what little remains. Little can be said of this site other than it appears to be a single dump that has been spread over a larger area through wind and erosion, and partly disturbed from modern impacts such as target practice. Excavations and extensive probing at the site determined that all artifacts are exposed on the surface. No land ownership information is available that could help identify the remnants of the holding pen or any past land uses to account for it (i.e., land patent claims, etc.).

No additional information can be gleaned from the site because of the assemblage's limited diversity. For these reasons, this site is not considered historically significant, it is not eligible for listing in the CRHR or local register, and it possesses no attributes that would make it significant under the County RPO. Under the County's guidelines for determining significance, the site is considered important. Significant impacts to the site are considered mitigated through the current evaluation effort, curation of recovered materials, documentation, and archaeological monitoring of ground-disturbing activities during construction for the entire project area to control for unanticipated discoveries.

5.2.7 Evaluation of CA-SDI-21497

CA-SDI-21497 is a diffuse historic period refuse deposit consisting almost entirely of cans that tend to date from 1917-1929. One small concentration of artifacts appears to be the origin point of the refuse dump that has been widely dispersed since its deposition through wind, erosion, and modern impacts including target practice. Cans are mostly food and beverage containers, with the majority being hole-in-top milk cans. Test excavations determined that all artifacts are located on the surface. No historical land use information is available that could indicate local landholders as a source for the historic refuse.

No additional information can be gleaned from the site because of the assemblage's limited diversity. For these reasons, this site is not considered historically significant, it is not eligible for listing in the CRHR or local register, and it possesses no attributes that would make it significant under the County RPO. Under the County's guidelines for determining significance, the site is considered important. Significant impacts to the site are considered mitigated through the current evaluation effort, curation of recovered materials, documentation, and archaeological monitoring of ground-disturbing activities during construction for the entire project area to control for unanticipated discoveries.

5.3 Impact Identification

The Jacumba Solar Project will grade the ground surface and trench to install buried utilities and conduit, in addition to construction of a solar field and associated facilities. Project implementation will directly impact seven archaeolgocial sites: CA-SDI-7074/6119/19627, CA-SDI-18675, CA-SDI-21492, CA-SDI-21493, CA-SDI-21494, CA-SDI-21496, and CA-SDI-21497. All impacted sites or portions of sites were evaluated and are considered not significant and not eligible for listing in the CRHR or local register, nor are any of them considered a significant resource under CEQA or under the County RPO. A portion of one site, CA-SDI-7074/6119.19627, located outside the APE was previously determined eligible for listing in the NRHP; therefore the portions within the Jacumba Solar Project ADI are considered non-contributing elements to the overall eligibility of the site. As such, impacts to each of these evaluated sites as a result of Project implementation will not be considered significant. However, all cultural resources are considered important under County of San Diego Guidelines for Determining Significance (County of San Diego 2007a). Together with the evaluations documented in this report, disposition of archaeological assemblages and documentation, and monitoring of earth-disturbing activities in the area of each evaluated site will reduce the impacts to these resources to less than significant under County Guidelines.

6.0 MANAGEMENT CONSIDERATIONS—MITIGATION MEASURES AND DESIGN CONSIDERATIONS

6.1 Unavoidable Impacts

6.1.1 Mitigation Measures and Design Considerations

There are no unavoidable impacts associated with the current project design. Human remains were identified at two locations within the Project area: Locus 3 of CA-SDI-7074/6119/19627 and CA-SDI-21495. These two locations are significant under the County RPO. In agreement with the County's requirements, the Project proponent committed to avoidance in place of these locations with an appropriate buffer, and no development is planned for these locations. Exclusionary fencing will be established around these locations during construction to protect them from inadvertent impacts. Both locations will be placed in dedicated open space and will be protected during construction with exclusionary fencing. All identified human remains in these locations were collected and repatriated to the KCRC's designated representative Clint Linton.

6.1.2 Off Site

The gen-tie corridor for this Project connects the northeastern corner of the solar facility to the ECO Substation. One prehistoric site, CA-SDI-7074/6119/19627 spans the entire gen-tie corridor. This site was previously evaluated on multiple occasions by Jordan (2010), Berryman and Whitaker (2010), and Williams and Whitley (2011); each study recommended the portions of the site within the ADI (formerly delineated as CA-SDI-6119 and CA-SDI-19627) as not significant and not eligible for listing in the CRHR. Williams and Whitley (2011) also evaluated the CA-SDI-7074 portion of the site and recommended it as significant and eligible for listing in the CRHR and NRHP; this portion of the site is outside the Jacumba Solar Project APE. A portion of the originally recorded CA-SDI-19627 is within the gen-tie corridor; however this portion of the site consists of a light density artifacts scatter of 1 artifact per 10 m, or the equivalent of the low-density scatter delineated by the distributional sampling. As this area is consistent with the "background noise" observed throughout the ADI and the Jacumba Valley in general and it is not a "site", no further fieldwork was warranted for the Jacumba Solar Project. The original recommendation of not eligible for CRHR listing supports current observations, and the portions of the site located within the ADI are further recommended as not eligible for listing in the local register and not significant under County of San Diego RPO; as a portion of the overall site has been determined eligible for listing in the CRHR and NRHP, the CA-SDI-6119/19627 portions of the site are therefore recommended as non-contributing elements to the overall eligibility and significance of the site. It is recommended that monitoring during construction of earth-disturbing activities associated with Project implementation be undertaken to adequately treat inadvertent discoveries. Any inadvertent discoveries must be evaluated for

historical significance and, if necessary, significant impacts mitigated through data recovery. A monitoring and data recovery plan should be developed to address protocols for treatment of any discoveries made during construction. Future ground disturbing activities for the gen-tie should include avoidance areas for portions of the site with greater potential for significant buried deposits which were not evaluated, and minimization of ground disturbances.

6.2 Mitigatable Impacts

6.2.1 Mitigation Measures and Design Considerations

All seven sites (or portions of sites) evaluated during the current investigation within the Project ADI are recommended as not significant under CEQA, not eligible for listing in the CRHR or the local register, and as not significant under the County RPO (CA-SDI-7074/6119/19627, CA-SDI-18675, CA-SDI-21492, CA-SDI-21493, CA-SDI-21494, CA-SDI-21496, and CA-SDI-21497) (County of San Diego 2007a) (Table 6-1). A portion of one site (CA-SDI-7074/6119/19627) located outside the ADI was determined eligible for listing in the NRHP and CRHR; therefore the evaluated portion of the site within the ADI are recommended as non-contributing elements to the overall eligibility of the site. However, under County guidelines, all archaeological sites are considered important. Impacts to the importance of the sites is mitigated through application of measures that include curation of all collected artifacts and documentation, and construction monitoring, along with erection of temporary fencing around unimpacted portions of CA-SDI-7074/6119/19627 and CA-SDI-18675 to prevent direct and indirect impacts during project activities; temporary fencing along the MUP limits where sites are outside the project boundary should also occur for those sites that fall within 50 feet of the Project impact area. The artifacts collected during the current testing program will be curated at the San Diego Archaeological Center, with the exception of those artifacts found in association with human remains, which have been repatriated to the KCRC. Implementation of mitigation measures will reduce impacts to these site to less than significant.

6.3 Effects Found Not to be Significant

There are 19 archaeological sites that are located within the Project parcel but are outside of the Project ADI (see Table 6-1). These sites will not be impacted by Project implementation but will be placed in an open space conservation easement. Avoided sites within 50 feet of Project impact areas, or according to resource specific, predetermined buffers, will be protected by establishment of an ESA boundary and exclusionary fencing. Therefore, no significant impacts will occur to avoided sites.

Table 6-1
Archaeological Site Management Recommendations

Site Number	Site Type	Time Range	Significance/ Eligibility Status	Impact	Recommendations / Mitigation Measures	Impact Significance After Mitigation
CA-SDI-176	Habitation	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-4448	Quarry and Temporary Camp	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; ; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-4477	Temporary Camp	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; ; RPO: Significance Assumed Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-7074/6119/19627	Habitation/ Lithic Scatter/ Refuse Scatter / Foundation	Multi-component	**Evaluated** Overall Site: Section 106: Significant; CEQA: Significant; Portion of Site in ADI: County: Important; CEQA: Not Significant, Not Contributing Element to Overall Site Significance; RPO: Not Significant; Section 106: Not Significant, Not Contributing Element to Overall Site Significance; Human Remains: CEQA & RPO Significant	Significant	Recordation, Curation, Monitoring Human Remains: Avoidance – Open Space; Temporary Fencing	Less Than Significant Human Remains – CEQA & RPO Significant; No Significant Impact

Table 6-1
Archaeological Site Management Recommendations

Site Number	Site Type	Time Range	Significance/ Eligibility Status	Impact	Recommendations / Mitigation Measures	Impact Significance After Mitigation
CA-SDI-7060	Temporary Camp	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-7079/7080/7081	Artifact Scatter and Refuse Scatter	Multi-component	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed ; RPO: Significance Assumed Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-18765	Lithic Quarry	Prehistoric	**Evaluated** County: Important; CEQA: Not Significant; RPO: Not Significant; Section 106: Not Significant	Significant	Recordation, Curation, Monitoring	Less Than Significant
CA-SDI-20169	Refuse Scatter	Historic	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-20279	Refuse Scatter and Artifact Scatter	Multi-component	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-20280	Lithic Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact

Table 6-1
Archaeological Site Management Recommendations

Site Number	Site Type	Time Range	Significance/ Eligibility Status	Impact	Recommendations / Mitigation Measures	Impact Significance After Mitigation
CA-SDI-20282	Lithic Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; ; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-20283	Artifact Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; ; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-20284	Artifact Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-20285	Artifact Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; ; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-20286	Artifact Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-20287	Lithic Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact

Table 6-1
Archaeological Site Management Recommendations

Site Number	Site Type	Time Range	Significance/ Eligibility Status	Impact	Recommendations / Mitigation Measures	Impact Significance After Mitigation
CA-SDI-20300	Lithic Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-21492	Artifact Scatter, Roasting Pits	Prehistoric	**Evaluated** County: Important; CEQA: Not Significant; RPO: Not Significant; Section 106: Not Significant	Significant	Recordation, Curation, Monitoring	Less Than Significant
CA-SDI-21493	Artifact Scatter	Prehistoric	**Evaluated** County: Important; CEQA: Not Significant; RPO: Not Significant; Section 106: Not Significant	Significant	Recordation, Curation, Monitoring	Less Than Significant
CA-SDI-21494	Artifact Scatter	Prehistoric	**Evaluated** County: Important; CEQA: Not Significant; RPO: Not Significant; Section 106: Not Significant	Significant	Recordation, Curation, Monitoring	Less Than Significant
CA-SDI-21495	Human Remains	Prehistoric	**Not Evaluated** County: Important; CEQA: Significance Assumed; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-21496	Refuse Deposit	Historic	**Evaluated** County: Important; CEQA: Not Significant; RPO: Not Significant; Section 106: Not Significant	Significant	Recordation, Curation, Monitoring	Less Than Significant
CA-SDI-21497	Refuse Deposit	Historic	**Evaluated** County: Important; CEQA: Not Significant; RPO: Not Significant; Section 106: Not Significant	Significant	Recordation, Curation, Monitoring	Less Than Significant

Table 6-1
Archaeological Site Management Recommendations

Site Number	Site Type	Time Range	Significance/ Eligibility Status	Impact	Recommendations / Mitigation Measures	Impact Significance After Mitigation
CA-SDI-21498	Lithic Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; ; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-21499	Lithic Scatter	Prehistoric	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; ; RPO: Significance Assumed; Section 106; Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact
CA-SDI-21500	Refuse Deposit	Historic	**Not Evaluated** County: Assumed Important; CEQA: Significance Assumed; ; RPO: Significance Assumed; Section 106: Not Evaluated	Avoided/ Not Significant	Avoidance – Open Space, Recordation, Curation, Monitoring, Temporary Fencing	No Significant Impact

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Williams, B., 2011. *Research Design for Archaeological Data Recovery at CA-SDI-7074 for the San Diego Gas & Electric East County Substation Project, San Diego County, California*. Submitted to the Bureau of Land Management.

Williams, B., J. Schaefer, and M. Becker, 2013. *Assessment of deeply buried features identified in SDG&E's East County Substation Project (ECSP), San Diego County, California (Revised)*. Submitted to the Bureau of Land Management and California Public Utilities Commission.

Williams, B., I. Scharlotta, and I. Cordova, 2014a. *Mitigation Survey for Approximately 210 Acres of Bureau of Land Management Property for San Diego Gas & Electric Company's East County Substation Project (ECSP), San Diego County, California*. Prepared for BLM El Centro Field Office and SDG&E Major Projects.

Williams, B, J. Schaefer, M. Becker, D. Laylander, and I. Cordova, 2014b. *Draft Archaeological Research Analysis at SDI-7074 within San Diego Gas & Electric Company's East County Substation Project (ECSP), San Diego County, California*. Prepared for the BLM El Centro Field Office and San Diego Gas & Electric.

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8.0 LIST OF PREPARERS AND PERSONS AND ORGANIZATIONS CONTACTED

Micah Hale (Dudek): Acted as Project Manager and approved the technical report.

Brad Comeau (Dudek): Acted as Principal Investigator, Field Director, and authored the technical report.

Jill Weinberger (Dudek): Performed the geomorphological study and prepared portions of the technical report.

Mathew Maxfeldt (Dudek): Co-Field Director, directed laboratory processing.

Patrick Hadel, Christopher Hipwood, Epifanio Figueroa, Edgar Rojas, and Erica Arrowsmith (Dudek): Acted as field and laboratory crew.

Gabe Kitchen, Bobo Linton, and Phillip Pena (Red Tail): Acted as Native American monitor during fieldwork.

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9.0 RESOURCE MITIGATION MEASURES

Impacted Archaeological Sites	
Site Numbers	*Mitigation Measures*
CA-SDI-7074/6119/19627, CA-SDI-18675, CA-SDI-21492, CA-SDI-21493, CA-SDI-21494, CA-SDI-21496, CA-SDI-21497	Recordation, Curation, Monitoring; Human Remains: Avoidance – Open Space
Avoided Archaeological Sites	
Site Numbers	*Mitigation Measures*
CA-SDI-176; CA-SDI-4448; CA-SDI-4477; CA-SDI-7060; CA-SDI-7079; CA-SDI-20169; CA-SDI-20279; CA-SDI-20280; CA-SDI-20282; CA-SDI-20283; CA-SDI-20284; CA-SDI-20285; CA-SDI-20286; CA-SDI-20287; CA-SDI-20300; CA-SDI-21495; CA-SDI-21498; CA-SDI-21499; CA-SDI-21500; and avoided portions of: CA-SDI-7074/6119/19627; CA-SD-18765	Avoidance – Open Space; Recordation, Curation, Monitoring, Temporary Fencing; Human Remains: Avoidance – Open Space

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APPENDIX A (CONFIDENTIAL)

SCIC Records Search Results

APPENDIX B (CONFIDENTIAL)

NAHC and Tribal Correspondence

APPENDIX C (CONFIDENTIAL)

Confidential Figures and DPR Site Record Forms

APPENDIX D

Résumés of Key Personnel

Brad Comeau

Archaeologist

Brad Comeau is an archaeologist with over 9 years' experience as a field director, archaeological monitor, and laboratory technician. He has conducted numerous surveys, evaluation excavations, and data recoveries, primarily in Southern California. He has extensive experience in San Diego County, with additional experience in Riverside County, the Mojave Desert, San Joaquin Valley, and Imperial County, as well as Massachusetts, Arizona, and England. His research interests include the role of experimentation in archaeology, copper production techniques, and lithic production.

EDUCATION

University of Sheffield

MS, Experimental Archaeology, 2012

University of Massachusetts, Amherst

BA, Anthropology, 2004

BA, Italian Studies, 2004

CERTIFICATIONS

Occupational Health and Safety Administration Hazardous Waste Operations and Emergency Response 40-hour Course, 2011

City of San Diego, Certified Archaeological Monitor, 2009

PROFESSIONAL AFFILIATIONS

Society for American Archaeology, 2012

Bath and Camerton Archaeological Society, 2012

Society for California Archaeology, 2008

Project Experience

Energy

Archaeological Services for the McCoy Solar Energy Project, Blythe, Riverside County, California, 2014-Present. As Principal Investigator, oversaw and implemented compliance monitoring for transmission line and solar field, including archaeological significance evaluations and mitigation, tribal coordination, and documentation, under CEQA, Riverside County guidelines, and Section 106 guidelines.

Jacumba Solar Extended Phase 1, NextEra, Jacumba, San Diego County, California. As principal investigator, conducted site examinations and limited shovel test pit excavation; directed a crew of two people; prepared a letter report of findings.

San Jacinto Solar Project, NextEra, Riverside County, California. As principal investigator, performed site visit and record search review of project area; prepared constraints analysis assessing the potential for sensitive cultural materials.

Tule Wind Cultural Resources Testing, HDR Inc., McCain Valley, San Diego County, California. As field director, conducted eligibility testing for one prehistoric site, led a crew of four people, and assisted in producing an ARMR report of findings.

Occidental of Elk Hills Block Survey II, Occidental Petroleum, Taft, Kern County, California. As field director, conducted pedestrian survey of 2,560 acres in the Elk Hills Oil Field; led a crew of six people; prepared site forms and site descriptions for technical report.

Class III Cultural Resources Inventory, Occidental Petroleum, Taft, Kern County, California. As field director, conducted pedestrian survey of 2,560 acres in the Elk Hills Oil Field; led a crew of six people; performed records search at the Southern San Joaquin Valley Information Center and Bureau of Land Management (BLM) Bakersfield office; prepared site forms and site descriptions for technical report.

Five Well Pads Cultural Resources Survey, Occidental Petroleum, Kern County, California. As field director, led a crew of two people for a Class Ⅲ pedestrian survey of 60 acres near McKittrick, California; performed the record searches at the Southern San Joaquin Valley Information Center and BLM Bakersfield office.

Vintage Kern Front Inventory, Vintage Production California LLC, Oildale, Kern County, California. As field director, led a crew of five people for a Class III pedestrian survey of 184 acres in the Kern Front Oil Field; prepared primary record.

Gildred Solar Cultural Resources Survey, Gildred Building Company, Ocotillo Wells, San Diego County, California. As field director, led a crew of four for a Class III pedestrian survey of 440 acres; coordinated Native American monitor participation: assisted with preparation of ARMR technical report.

Silurian Valley West Cultural Resources Study, Iberdrola Renewables, Baker, San Bernardino County, California. As crew chief, led a crew of four people for a Class II pedestrian survey of 4,500 acres within the project right-of-way; assisted the field director in organizing and scheduling two field crews; trained crew members in operation of Bluetooth-enabled laser range finder.

TL 637 Survey Santa Ysabel to Creelman, San Diego Gas & Electric, San Diego County, California. As archaeological monitor, performed pre-construction fielding study with engineers, biologists, and construction managers for an electrical transmission line pole replacement; located previously recorded sites; helped direct new pole locations to avoid site impacts.

East County Substation Survey, Insignia Environmental, Jacumba, San Diego County, California. As crew chief, conducted survey of linear electric transmission line; directed a crew of three people; recorded multiple prehistoric and multicomponent sites; prepared site forms and site descriptions for technical report of findings.

Sunrise Powerlink Evaluations, San Diego Gas & Electric, San Diego and Imperial Counties, California. As field director, conducted subsurface testing of 17 sites; directed a crew ranging from three to six people; helped organize laboratory artifact processing.

Devers–Palo Verde 2 Survey, Southern California Edison, Riverside County, California. As field director, conducted Class III intensive survey of selected portions of a transmission line area of potential effect (APE); relocated and updated previously recorded sites; identified and recorded new sites.

Colorado River Staging Yard Survey, Southern California Edison, Riverside County, California. As crew chief, conducted Class III pedestrian survey of the Colorado River Staging Yard for the Devers–Palo Verde 2 electric transmission line near Blythe; identified and recorded numerous World War II–era sites relating to the Desert Training Center; led a crew of two people.

Tule Wind Project Surveys, HDR Inc., McCain Valley, San Diego County, California. As field director, conducted Class II and Class III intensive pedestrian surveys over 4,900 acres; coordinated multiple survey crews; scheduled and coordinated with Native American monitors; prepared site forms; assisted in producing an ARMR report of findings.

Sunrise Powerlink Survey and Monitoring, San Diego Gas & Electric, San Diego and Imperial Counties, California. As crew chief, led survey crew of four people and two Native American monitors for Class III survey of project APE; coordinated with Native American monitors; created survey schedules in conjunction with the field director and right-of-way agents.

Development

St. John Garabed Church Project, San Diego County, California. As field director, conducted site examinations and limited shovel test pit excavation for an Extended Phase 1 survey; directed a crew of two people; prepared a letter report of findings.

Rhodes Crossing Update, Rhodes Properties, San Diego, California. As field director, led a crew of two people for a Class III pedestrian survey of 88 acres; coordinated Native American monitor participation; assisted with preparation of Archaeological Resource Management Report (ARMR).

Gregory Canyon Landfill Environmental Impact Statement PHI Assessments, PCR Services Corporation, Pala, San Diego, California. As field director, conducted pedestrian survey of proposed landfill; relocated and verified previously recorded sites; led a crew of four people; coordinated with Native American monitors; prepared site forms and site descriptions for ARMR report.

Robertson Ranch East Excavation, The Corky McMillin Companies, Carlsbad, San Diego County, California. As field director, conducted controlled grading of two prehistoric sites that required directing excavation activities of multiple types of heavy machinery; led excavation of numerous roasting pit features by a crew of up to 20 people; instructed crew in carbon-14, thermoluminescence, and soil floatation sampling techniques.

Sky Ranch Monitoring, Lennar, Santee, San Diego County, California. As archaeological monitor, monitored mass grading activities for construction of a subdivision.

Sky Ranch Data Recovery, Lennar, Santee, San Diego County, California. As crew chief, conducted data recovery excavation of two prehistoric sites; led a crew of up to eight staff; drew site maps and unit profiles; collected carbon-14 and soil floatation samples.

4S Ranch Data Recovery, 4S Ranch Company, Rancho Bernardo, San Diego County, California. As field technician and crew chief, conducted Phase III data recovery of a large Late Prehistoric site; excavated numerous hearth features; drew site maps and unit profiles; created a site grid for unit placement; collected carbon-14 and soil floatation samples.

Atlas Monitoring and Excavation, D. R. Horton, San Diego County, California. As archaeological monitor, monitored building/subterranean parking structure excavation; excavated historic deposits.

The Rock Academy Monitoring, The Rock Church, San Diego, California. As archaeological monitor, monitored building foundation excavation, trenching, and building demolition.

Vantage Point, Point of View Monitoring LLC, San Diego County, California. As archaeological and paleontological monitor, monitored excavation, drilling, and other construction activities during the excavation of a subterranean parking garage and building footings. Recorded and collected artifacts and marine fossils.

Audie Murphy Ranch Monitoring, Woodside Homes, Sun City, Riverside County, California. As archaeological monitor, monitored controlled grading of five sites in collaboration with Native American monitors; excavated hearth features; monitored construction grading.

Roberston Ranch Data Recovery, The Corky McMillin Companies, Carlsbad, San Diego County, California. As field technician, excavated four prehistoric sites as part of a data recovery program, including test unit excavation, wet screening, drawing and photographing profiles, excavating hearth and pit features, and artifact sorting.

LaPozz No. 5 Lode Evaluation, Enviroscientists, Indian Wells Valley, Kern County, California. As field director, led a crew of four people for an evaluation testing program of three prehistoric sites; prepared site form updates and site testing results for the ARMR technical report.

Faraday Data Recovery, Carlsbad, San Diego County, California. As field technician, excavated five prehistoric sites as part of a data-recovery program, including test unit excavation, drawing profiles, wet screening, and sorting artifacts.

Education

Palomar College 7 Building Historic Evaluation, Palomar Community College District, San Marcos, San Diego County, California. As Global Positioning System (GPS) technician and photographer, assisted architectural historians in recording potentially historic buildings; photographed and recorded buildings with Ricoh digital camera, range finder, and Trimble GeoXH GPS.

University House Excavation, University of California, San Diego, San Diego County, California. As crew chief, conducted Phase II test excavation using wet screening; led a crew of five people.

San Marcos Unified School District Monitoring, San Marcos Unified School District, San Diego County, California. As archaeological monitor, monitored transplanting of endangered species by biologists prior to construction grading of site.

Maranatha Excavation, Maranatha Christian School, Rancho Bernardo, San Diego County, California. As field technician, excavated test units for a Phase III data recovery of an archaic period site; drew unit profiles; sorted artifacts.

Federal

Bunker Hill Survey, GSR Corporation, Imperial Beach, San Diego County, California. As field director, conducted Class III pedestrian survey of a road improvement and fence construction covering 7.6 acres for the border fence; directed a crew of two people; recorded a previously identified site for a future nomination to the National Register of Historic Places; prepared site form update; prepared ARMR technical report of findings.

Imperial County Drill Sites Survey, United States Geological Survey, Imperial County, California. As field director, conducted survey of two water well drilling sites; coordinated U.S. Border Patrol escort; prepared ARMR technical report of findings.

BLM Western Expansion Survey, TEC Environmental, Johnson Valley, San Bernardino County, California. As crew chief, surveyed various locations throughout the BLM Johnson Valley off-highway vehicle area; identified and recorded new sites; coordinated survey schedule with the field director.

Border Fence Project Survey and Monitoring, U.S. Army Corps of Engineers, San Diego County, California, and Pima, Santa Cruz and Cochise Counties, Arizona. As archaeological monitor, monitored construction of the U.S./Mexico border fence; surveyed locations of proposed construction activity; mapped new archaeological sites; directed construction activities away from archaeological resources.

Military

Fort Irwin Solar Project, Soitec LLC, Fort Irwin, San Bernardino County, California. As principal investigator, directed pedestrian survey of 12 acres for a proposed solar generation facility; also prepared the technical report.

Level 3 Powerline Road Fiber-Optic Project, HP Communications Inc., Fort Irwin, San Bernardino County, California. As principal investigator, conducted intensive pedestrian survey of approximately 10 acres; also prepared the ARMR technical report of findings.

Naval Air Weapons Station (NAWS) Road Survey, Naval Facilities Engineering Command (NAVFAC) Southwest, Ridgecrest, Inyo, San Bernardino, and Kern Counties, California. As field director, conducted Class III pedestrian survey of approximately 129 miles of existing roads; led a crew of four people; scheduled and coordinated with Explosive Ordnance Disposal escorts; prepared ARMR technical report of findings.

NAWS Fiber-Optic Survey, Epsilon Systems Solutions, Ridgecrest, San Bernardino County California. As crew chief, conducted Class III pedestrian survey for a proposed fiber-optic line; led a crew of two people; assisted the field director with scheduling.

Delivery Order (DO) 30 Survey, NAVFAC Southwest, Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, San Bernardino County, California. As crew chief, surveyed numerous proposed landing zones throughout MCAGCC; coordinated scheduling/training area access with the field director; prepared site forms and site descriptions for ARMR report.

53 Aerial Maneuver Zone (AMZ) Survey, NAVFAC Southwest, MCAGCC Twentynine Palms, San Bernardino County, California. As crew chief, surveyed numerous proposed landing zones throughout MCAGCC Twentynine Palms; coordinated scheduling/training area access with the field director; prepared site forms and site descriptions for ARMR report.

Southwest Division (SWDIV)-04/DO 27 Survey, NAWS China Lake, NAVFAC Southwest, Ridgecrest, Inyo County, California. As field technician, participated in a Class III intensive survey under Section 106 of National Historic Preservation Act; operated a Trimble GeoXH for navigation and site recording.

Resource Management

St Algar's Farm Geochemical Testing, English Heritage, Frome, Somerset, United Kingdom. As student volunteer, helped perform a pXRF field survey of a Roman-era glass and metalworking site; excavated a 5-by-5-meter trench.

Transportation

Palomar Station Project Survey, Integral Communities Inc., San Marcos, San Diego County, California. As field director, conducted Class III pedestrian survey of 14.5-acre parcel and prepared ARMR technical report of findings.

Water/Wastewater

Temescal Canyon and Dawson Canyon Pipelines and Non-Potable Water Tank Project, Lee Lake Water District, Riverside County, California. As principal investigator, performed Phase I intensive pedestrian survey of the project APE; also prepared letter report of findings.

Padre Dam Data Recovery, Padre Dam Municipal Water District, Lakeside, San Diego County, California. As field director, conducted a data recovery project of a late prehistoric site using wet screening; led a crew of six; coordinated with Native American monitors; performed shell and ceramic lab analysis studies.

Publications

Professional Presentations

Finding the Smith in Hammerscale Palais: Investigations at an Experimental Iron Production Site. Poster presented at the 39th International Symposium on Archaeometry 2012. Co-author.

Archaeological Investigations at Site CA-SDI-10,611: A Functional and Temporal Analysis of Subterranean Pit Features In Northern San Diego County. Presented at Society for California Archaeology Annual Meeting 2008. Co-author.

The Burghardts of Great Barrington: The View from the W.E.B. Du Bois Boyhood Homesite. Presented at the Society for Historical Archaeology Conference 2005. Co-author.

Technical Reports

2013 *Draft Archaeological Survey Report for the Fort Irwin Solar Project, Fort Irwin, San Bernardino County, California*. Brad Comeau, MSc, and Micah Hale, PhD, RPA.

2012 *Results of Extended Phase 1 Shovel Probing at Potentially Sensitive Archaeological Sites for the Jacumba Solar Project, San Diego County, California*. Brad Comeau, MSc, and Micah Hale, PhD, RPA.

2012 *Cultural Resources Report for the Extended Phase I Survey for the St. John Garabed Church Project, San Diego County, California*. Brad Comeau, MSc, and Micah Hale, PhD, RPA.

2012 *Cultural Resources Survey Report for the Lee Lake Water District Dawson Canyon Non-potable Water Storage Tank and Pipeline Design Project, Riverside County, California*. Brad Comeau, BA, and Micah Hale, PhD, RPA.

2011 *Class III Archaeological Inventory of 2,560 Acres Comprised of the Entire Sections of 10Z, 14D, 20B, 28B, 32G, Elk Hills, Kern County, California*. David Whitley, PhD, RPA; and Brad Comeau, BA; and Michelle Dalope, BA.

2011 *An Archaeological Evaluation of KER-7290, KER-7293 and KER-7294 for the LaPozz No. 5 Lode Claim (CAMC286149), Indian Wells Valley, Kern County, California*. Mark S. Becker, PhD, RPA; Brad Comeau, BA; and Tony Quach, BA.

2011 *Cultural Resources Inventory for the Gildred Solar Project, San Diego County, California*. Chad Willis, MA, RPA; Micah Hale, PhD, RPA; and Brad Comeau, BA.

2011 *Cultural Resources Inventory Report for the Rhodes Crossing Project, San Diego County, California*. Chad Willis, MA, RPA; Micah Hale, PhD, RPA; and Brad Comeau, BA.

2011 *Class II Cultural Resources Inventory for the Silurian Wind Project, Silurian Valley, San Bernardino County, California*. Diane Winslow, MA, RPA; Micah Hale, PhD, RPA; Sherri Andrews, MA, RPA; and Brad Comeau, BA.

2011 *An Archaeological Inventory of Historic and Contemporary Roads at Naval Air Weapons Station China Lake, Inyo, Kern, and San Bernardino Counties, California*. Brad Comeau, BA; Mark A. Giambastiani, PhD, RPA; and Oliver Patsch, BA.

2011 *Cultural Resources Survey Report for the Palomar Station Project, San Marcos, San Diego County, California*. Brad Comeau, BA, and Micah Hale, PhD, RPA.

2011 *An Archaeological Survey of Bunker Hill in Border Field State Park, San Diego County, California*. Brad Comeau, BA, Scott Wolf, BA, and Micah Hale, PhD, RPA.

2010 *Archaeological Survey Report for the Imperial County Drill Sites Project, Imperial County, California*. Brad Comeau, BA, and Jerry Schafer, PhD, RPA.

2010 *Class II and Class III Cultural Resources Inventory Report for the Tule Wind Project, McCain Valley, San Diego County, California*. Micah Hale, PhD, RPA; Brad Comeau, BA; and Chad Willis, MA.

2010 *Draft Study Plan for Cultural Resources: Gregory Canyon Landfill, San Diego County, California*. Don Laylander and Brad Comeau.

2009 *Data Recovery Excavations at CA-SDI-18472 for the Proposed Padre Dam Municipal Water District Secondary Connection Project (Ridge Hill Facilities), Johnstown, San Diego County, California*. Micah Hale, PhD, RPA, with contributions by Brad Comeau and Aaron Sasson.

Master's Dissertation

2012 *Investigating Metallurgical Practice: An Experimental Study of the Sintashta Well-Tunnel-Furnace (WTF) from the Middle Bronze Age, Siberia, Russia*. University of Sheffield.

Volunteer History

2012 Student Placement, English Heritage, Portsmouth, United Kingdom.

Awards/Commendations

1999–2003 Francis Ouimet Scholar

Relevant Previous Experience

- **2012–present Archaeologist, Dudek, Encinitas, California**
- **2009–2011 Associate Archaeologist, ASM Affiliates Inc., Carlsbad, California**
- **2008–2009 Archaeological Monitor, E^{2}m, Denver, Colorado**
- **2008 Archaeological Monitor/Field Technician, URS Corporation, San Diego, California**

- **2005–2008 Field Supervisor, Brian F. Smith and Associates, Poway, California**
- **2003–2004 Field/Lab Technician, University of Massachusetts Archaeological Services, Amherst, Massachusetts**
- **2003 Field School in Archaeology, University of Massachusetts Amherst/Great Barrington, Massachusetts.** As student, participated in site surveying and mapping using theodolite; instructed in and participated in excavation and laboratory methodology; participated in geophysical surveying.

Micah Hale, PhD, RPA

Senior Archaeologist

Micah Hale is Dudek's cultural resources practice manager and lead principal investigator, with technical expertise as a lithic and groundstone analyst, invertebrate analyst, and in-ground penetrating radar. Over the course of his 18 year career, Dr. Hale has served as a principal investigator in the public and private sector for all levels of archaeological investigation, as a public outreach coordinator and as an assistant professor at the University of California (UC), Davis. Dr. Hale functions as a principal investigator in project oversight including proposals, research designs, fieldwork, artifact analysis, and report authorship.

EDUCATION

University of California, Davis
PhD, Anthropology, 2009

California State University, Sacramento
MA, Anthropology, 2001

University of California, Davis
BS, Anthropology, 1996

CERTIFICATIONS

Register of Professional Archaeologists (RPA), 2001

PROFESSIONAL AFFILIATIONS

Society for American Archaeology

Society for California Archaeology

Antelope Valley Archaeological Society

San Diego Archaeological Society

Dr. Hale's experience spans California, Arizona, Nevada, and Oregon, including: work for Naval Facilities Engineering Command (NAVFAC) Southwest; California Department of Transportation (Caltrans); Western Area Power Administration; Bureau of Land Management (BLM); U.S. Army Corps of Engineers (ACOE); U.S. Fish and Wildlife Service (USFWS); California State Parks; various city and county agencies; and direct work for Native American groups. Dr. Hale has supervised numerous large-scale surveys, test excavations, data recovery programs, and geoarchaeological investigations, and has served as a third party review consultant, and an expert witness in legal proceedings. He has authored research designs, management and treatment plans, proposals, preliminary and final reports, and technical analyses.

Project Experience

Development

Phase II Archaeological Data Recovery for the Newland Homes Sierra Project, San Diego County, California, 2013-present. As project manager and principal investigator, supervising data recovery investigations at two significant prehistoric archaeological sites and historic archival research of a homestead in support of the Newland Sierra Environmental Impact Report (EIR).

Phase I Archaeological Inventory and Phase II Archaeological Evaluation for the Yokohl Ranch Project, Tulare County, California, 2012-2013. As project manager and principal investigator, supervised completion of 12,000 acre survey and archaeological evaluation of 85 prehistoric and historical archaeological sites in support of the Yokohl Ranch EIR.

Phase I Inventory and Phase II Cultural Resources Evaluation for the Star Ranch Project, RBF Consulting, San Diego County, California, 2011. As project manager and principal investigator, supervised CEQA inventory and evaluation for private development.

Phase II Archaeological Evaluation of Two Prehistoric Sites, Torrey Pines Glider Port, San Diego County, California, 2012. As project manager and principal investigator, supervised CEQA evaluation of two prehistoric archaeological sites for the Torrey Pines City Park General Development Plan.

Data Recovery of One Prehistoric Site for the Rhodes Property, Sea Breeze Properties, San Diego County, California. As project manager and principal investigator, supervised CEQA compliant data recovery of a large prehistoric site for a residential development.

Archaeological Survey of the Paramount Mine Exploratory Drilling Project, Essex Environmental, Mono County, Nevada, 2006. As principal investigator and field director, conducted archaeological survey for mining exploration and prepared the technical report.

Phase I Inventory of 1,544 Acres and Phase II Evaluation of Archaeological Sites along the Western and Northwestern Boundaries, Edwards Air Force Base, Kern County, California, 2005. As field director, supervised a Phase I inventory of 1,544 acres. Recorded 30 new archaeological sites, more than a dozen "sub-modern" refuse dumps, and a variety of isolate finds. Notable sites include several early Holocene lithic scatters (Lake Mojave-, Silver Lake-, and Pinto-age deposits), a rhyolite lithic quarry, and a complex of historic dumps associated with homesteading activities around Lone Butte.

Pankey Ranch Testing, Pardee Homes, Northern San Diego County, California, 2004. As field director, supervised excavation of shovel test pits to delineate the boundaries of site CA-SDI-682, the prehistoric village of Tom-Kav. Managed field personnel, conducted excavation, and wrote portions of technical report.

Oceanside Hilton EIR, Dudek Associates, Oceanside, San Diego County, California, 2004. As principal investigator and field director, conducted a survey of the proposed Hilton Hotel at the eastern end of Buena Vista Lagoon in Carlsbad and prepared portions of technical report for an EIR.

Archaeological Survey of the La Mesa Meadows Residential Development Project, Helix Environmental, San Diego County, California, 2005. As principal investigator, conducted a survey of a proposed residential development in San Diego County.

Data Recovery of Locus O, Star Canyon Development, Agua Caliente Band of Cahuilla Indians, Palm Springs, Riverside County, California, 2004. As field director, supervised field crews for data recovery mitigation of an archaeological deposit and human remains near Tahquitz Canyon. Coordinated with Native American representatives and prepared portions of the technical report.

Linda Vista Survey, City of San Marcos Planning Department, San Diego County, California, 2003. As field director, conducted a Phase I cultural resource inventory of the proposed road realignment in San Marcos. Prepared technical reports and made recommendations for additional work to be done within the project area.

Archaeological Monitoring for Williams Communications Fiber-Optic Line, Jones and Stokes Associates, San Luis Obispo and Bakersfield, Kern and San Luis Obispo Counties, California, 2001. As resource monitor/Native American coordinator, conducted archaeological monitoring for a fiber-optic cable installation project that spanned 180 miles from San Luis Obispo to Bakersfield. Identified and protected archaeological resources in the project area in compliance with state and federal regulations. Managed Native American monitors and coordinated daily work with construction and environmental staff to facilitate project completion.

AT&T Cable Removal Project, Jones and Stokes Associates, Taft to Los Angeles, Kern and Los Angeles Counties, California, 1998. As field archaeologist, conducted a survey to determine archaeological impact by the removal of a lead-lined subsurface cable.

Subsurface Survey of a Proposed Bicycle Path Along the Columbia River Slough in Northwest Portland, City of Portland, Multnomah County, Oregon, 2000. As field archaeologist, conducted auger testing in a variable north-to-south transect at 30-meter intervals, and unit mapping.

Phase II Test Excavations, AT&T, Portland, Multnomah County, Oregon, and Vancouver, Clark County, Washington, 1999. This project determined the presence and condition of any cultural resources in the project areas that were situated on the northern and southern sides of the Columbia River in Washington and Oregon.

Education

Data Recovery for the Palomar North and Meadowood Projects, Palomar College, San Diego County, California, 2012. As principal investigator, supervised Section 106 and CEQA-compliant data recovery of the ethnohistoric village of Tom-Kav. Expert witness for litigation of archaeological work for the client.

Data Recovery Excavations in Advance of Geotechnical Coring at W-12, University of California San Diego (UCSD), San Diego County, California, 2009. As project manager and principal investigator, supervised data recovery excavations in a midden dated as early as 9,600 years before present.

Archaeological Test Excavations at Selected Sites on Vandenberg Air Force Base, University of California, Davis, Lompoc, Santa Barbara County, California, 2008. As principal investigator and field director, supervised and instructed 21 students for the 2008 U.C. Davis Field School.

Archaeological Survey and Excavations in the Polar Arctic, University of California Davis, Northwest Greenland, 2006. As researcher, conducted a project for the National Science Foundation, National Geographic, and the Inglefieldland Polar Archaeology Expedition; U.C. Davis.

Energy

Phase II Evaluation of 19 Archaeological Sites for Soitec's Tierra Del Sol Solar Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented significance evaluations, including fieldwork and documentation, under CEQA and San Diego County guidelines within the development footprint.

Phase II Evaluation of 42 Archaeological Sites for Soitec's Rugged Solar Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented significance evaluations, including fieldwork and documentation, under CEQA and San Diego County guidelines within the development footprint.

Class III Cultural Resources Inventory for the Level 3 Fiber Optic Installation Project, Fort Irwin Army Reserve and BLM, San Bernardino County, California, 2012-2013. As Project manager and co-principal investigator, oversaw and implemented cultural resource inventory of fiber optic corridor and recordation and evaluation of contributing elements to the NRHP-eligible LADWP transmission line corridor.

Class III Cultural Resources Inventory for Soitec's Fort Irwin Solar Project, San Bernardino County, California, 2013. As project manager and co-principal investigator, oversaw and implemented cultural resources inventory.

Third Party Compliance Monitoring for the Ocotillo Wind Energy Farm, Ocotillo, Imperial County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the Tule Wind Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the Bureau of Land Management to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the East County Substation Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM and California Public Utilities Commission (CPUC) to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the Rio Mesa Solar Project, Riverside County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM to ensure adherence to mitigation measures and proper treatment of cultural resources.

Phase II Archaeological Testing of One Historic Site for the Cool Valley Solar Project, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of a historic airfield near Campo.

Phase II Archaeological Testing of Four Prehistoric Sites for the Gildred Solar Project, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of four small prehistoric sites along the ancient Lake Cahuilla shoreline.

Phase II Archaeological Testing of One Prehistoric Site for the Borrego A and B Solar Projects, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of a large prehistoric habitation site in the Imperial Valley.

Phase I Cultural Resources Inventories for the Sol Orchard and Sol Focus Solar Projects, RBF Consulting, San Diego County, California. As project manager, supervised implementation of Phase I CEQA inventories for more than 22 solar projects.

Class II Survey of 4,700 Acres for the Silurian Wind Project, Iberdrola Renewables, San Bernardino County, California, 2011. As project manager and principal investigator, supervised Section 106 inventory of proposed renewable energy project.

Class III and Class II Cultural Resources Inventory for the Tule Wind Alternative Energy Project, HDR Engineering for Iberdrola Renewables, San Diego County, California, 2010. As project manager and principal investigator, supervised inventory of 6,000 acres and recordation of nearly 200 archaeological sites, and assisted the BLM in preparation of a programmatic agreement between Iberdrola and the California State Historic Preservation Office (SHPO).

Monitoring of the Installation of Meteorological (MET) Towers for the Tule Wind Project, HDR Engineering, San Diego County, California, 2010. As project manager and principal investigator, supervised archaeological and Native American monitors during MET tower installation in the Tule Wind project area.

Jamul Substation 6, San Diego Gas & Electric Company (SDG&E), Jamul, San Diego County, California, 2004. As field director, conducted an intensive pedestrian survey of 18 acres in Jamul for a proposed substation construction project. Identified and recorded two archaeological sites within the project area. Prepared the technical report. Coordinated with paleontology subcontractor and incorporated paleontology report into ASM's archaeology technical report.

Path 15 Transmission Line Corridor, Steigers Corporation, San Joaquin Valley, Fresno and Merced Counties, California, 2004. As field director, supervised survey of over 87 miles of 400-foot transmission line corridor and over 46 miles of access roads in Merced and Fresno Counties. Supervised field crew, documented sites, coordinated with Native American representatives, coordinated access to survey areas, and prepared portions of technical report.

Carmel Valley Substation Survey, SDG&E, Carmel Valley, San Diego County, California, 2003. As field director, conducted a Phase I cultural resource inventory of a proposed power substation.

Federal

Ground-Penetrating Radar Survey and Class III Inventory for the Friendship Circle Project, Department of Homeland Security, Gulf South Research Corporation, San Diego County, California. As project manager and principal investigator, supervised and implemented a ground-penetrating radar survey and surface survey for the Friendship Circle project at Border Fields State Park, San Diego.

Military

Phase II Evaluation of 31 High Complexity Sites on Edwards Air Force Base, CH2MHill/JT3, Kern and Los Angeles Counties, California, 2010. As project manager, oversaw Section 106 test excavations at 31 prehistoric archaeological sites.

Phase II Evaluation of 85 Archaeological Sites on Edwards Air Force Base, CH2MHill/JT3, Kern and Los Angeles Counties, California, 2010. As project manager and principal investigator, supervised Section 106 test excavations at 42 prehistoric and 43 historic archaeological sites.

Western Acquisition Survey, Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, San Bernardino County, California, 2010. As principal investigator, managed the survey of 10,000 acres on land administered by the BLM in Johnson Valley, west of the base. Duties included project management, coordination with BLM Barstow field office and MCAGCC 29 Palms personnel, coordinating and supervising field crews, as well as document preparation.

Management Plan for the Coso Rock Art National Historic Landmark (NHL), Naval Air Weapons Station (NAWS) China Lake, Inyo County, California, 2010. As project manager, supervised and co-authored a management plan for the Coso Rock Art NHL, including arranging and implementing stakeholder meetings and field testing the implementation plan.

Section 110 Intensive Archaeological Survey of the Cole Flat Training Area, NAWS China Lake, Inyo County, California, 2009. As project manager and principal investigator, supervised the survey of 5,400 acres near the Coso Rock Art NHL.

Phase I Survey of Selected Parcels in Five Training Areas, MCAGCC Twentynine Palms, San Bernardino County, California, 2009. As project manager and principal investigator, supervised survey of 4,500 acres in the Blacktop, Lava, Lavic Lake, Sunshine Peak, and Quackenbush training areas.

Phase I Survey of Aerial Maneuver Zones for the 53 AMZ Project, MCAGCC Twentynine Palms, California, 2009. As project manager and principal investigator, supervised survey of 72 Aerial Maneuver Zones. Client Reference: Leslie Glover, MCAGCC 29 Palms, 760.830.5369.

Cultural Resources Inventory and Evaluation for the Skaggs Island BRAC Disposal Archaeological Survey, Naval Communications Station, Sonoma County, California, 2011-2012. As principal investigator, supervised survey of installation and recordation and evaluation of historic civilian and military resources.

Phase I Survey of 8,100 Acres on Edwards Air Force Base, ACOE, Kern County, California, 2008–2009. As principal investigator, supervised survey of 8,100 acres on Edward Air Force Base.

Phase I and II Survey of 2,500 Acres and Evaluation of 50 Sites on Edwards Air Force Base, ACOE, Kern County, California, 2008. As principal investigator, supervised survey of 2,500 acres and evaluation of 50 sites on Edward Air Force Base.

Cultural Resources Inventory and Evaluation for the Concord Inland BRAC Disposal Archaeological Survey, Naval Weapons Station, Seal Beach, Detachment Concord, Contra Costa County, California. As principal investigator, supervised survey of 5,200 acres and recordation and evaluation of historic civilian and military resources, and prehistoric archaeological sites.

Archaeological Evaluation of Eight Prehistoric Sites in the Emerson and Quackenbush Training Areas, ACOE, MCAGCC Twentynine Palms, San Bernardino County, California, 2005. As field director, supervised excavation of eight prehistoric sites on the Marine Corps base in Twentynine Palms, California.

Archaeological Evaluation of 22 Sites on Edwards Air Force Base, ACOE, San Bernardino County, California, 2005. As field director, supervised the National Register evaluation of 22 sites at Edwards Air Force Base.

Naval Base Point Loma Site Recordation, NAVFAC Southwest (SW), Point Loma, San Diego County, California, 2004. As principal investigator and field director, supervised relocation of 33 sites located on Naval Base Point Loma. Reviewed site documentation and re-recorded sites that were improperly documented by past surveys.

Archaeological Testing of 23 Sites in the Las Pulgas Corridor, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2004. As field director, supervised field crews for Phase II testing and mechanical coring of 23 sites on Camp Pendleton. Coordinated with coring contractor and base personnel. Documented sites in the field. Supervised field crews and prepared portions of technical report.

Rose-Arizone, Clay, and Photo Drainage, and Road Improvement Surveys, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2004. As field director, supervised archaeological

surveys and the placement of protective signing on 750 sites. Coordinated access to the island and supervised one crew member.

Remote Sensing, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2004. As Global Positioning System (GPS) specialist, conducted data collection and image rectification for a remote sensing project in the detection of archaeological sites on the base. Supervised one crew member.

MCB Camp Pendleton Burn Survey, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2002. As field director, supervised an archaeological survey of 1,500 acres in the De Luz and Case Springs areas of Camp Pendleton. Managed field crews, documented archaeological sites, prepared site forms and portions of technical report.

Survey of Yuma Stormwater Basin, NAVFAC SW, MCAS Yuma, Yuma County, Arizona, 2002. As field director, supervised survey of stormwater basin along the Marine Corps airfield at MCAS Yuma. Managed field crew and prepared technical report. Client

Archaeological Coring of SDI-811, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2002. As field director, supervised first phase of a geologic coring project for a shell midden site along the coast of MCB Camp Pendleton, San Diego County. Coordinated with coring contractor and base personnel. Managed field monitors and field crew.

Archaeological Testing and Survey of the Lemon Tank Area, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2002. Conducted excavations, survey, and site recording.

Evaluation of Four Prehistoric Sites, Jones and Stokes Associates, Camp Roberts National Guard, San Luis Obispo County, California, 1998. As field technician, conducted excavation in order to determine the boundaries of the site for further mitigation.

Evaluation of Nine Prehistoric Sites, Edwards Air Force Base, San Bernardino County, California, 1999. As field archaeologist, evaluated nine sites through excavation to determine overall sensitivity and value of the archaeological remains that characterize the region.

Archaeological Survey and Excavation, ACOE, MCAGCC Twentynine Palms, San Bernardino County, California, 1998. As field archaeologist, participated in nine field rotations averaging 10 days each. Conducted survey of portions of the Marine Corps base to determine the distribution of cultural materials, and subsequently excavate sites based on priority. This area is characterized as high desert with the typically associated flora and fauna and archaeological sites that range in age from Early to Late Holocene.

Resource Management

Archaeological Data Recovery Excavations at Border Fields State Park, California State Parks, Imperial Beach, San Diego County, California, 2005. As field director, supervised excavation of prehistoric sites located within the APE of a fence along the U.S.–Mexico Border in San Diego County. Prepared technical report.

Archaeological Salvage Excavations of Two Ollas in Hellhole Canyon, BLM, San Diego County, California, 2005. As principal investigator, relocated a cache of prehistoric ceramic artifacts uncovered during wildfires in San Diego County. Documented cache and collected artifacts for subsequent reconstruction in the ASM laboratory. Prepared technical report detailing project.

Archaeological Data Recovery Excavations at CA-SDI-16691, Jackson Pendo Development Company, Escondido, San Diego County, California, 2005. As principal investigator, supervised data recovery excavation at a Late Prehistoric site in Escondido, California.

El Cuervo Wetlands Mitigation, City of San Diego Land Development Review Department and Mitigation Monitoring Coordination, Carmel Valley, San Diego County, California, 2004. As co-principal investigator, supervised an archaeological monitoring project in central San Diego County, conducted test excavation of one site identified during monitoring. The site was evaluated as not significant. Prepared portions of technical report and supervised on-site monitor.

Milk Vetch Emergency, Imperial Irrigation District, Imperial County, California, 2002. As archaeological monitor, conducted emergency monitoring along transmission line corridor in Imperial County. Coordinated with IID and construction personnel. Prepared technical report.

Burial Salvage Excavations at the Carp Site, CA-MER-295, California Department of Parks and Recreation, Los Banos, Merced County, California, 1999. As field supervisor, directed excavations at CA-MER-295 in the central San Joaquin Valley in order to salvage cultural remains (including burials) from further destruction by the San Joaquin River.

Archaeological Survey of the Silver Lake Recreation Area, El Dorado Irrigation District, El Dorado County, California, 2006. As principal investigator and field director, supervised an archaeological survey of the Silver Lake Recreation area.

Transportation

Ortega Highway Monitoring, City of San Juan Capistrano, Orange County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of water conveyance facilities and road repairs.

Archaeological Testing and Ground Penetrating Radar Study of the Forester Creek Biological Mitigation Area, Caltrans District 11, Santee, San Diego County, California, 2005. As principal investigator and field director, supervised archaeological testing of a private parcel.

Bridge 230.6 Replacement, North County Transit District, Agua Hedionda, Carlsbad, San Diego County, California, 2004. As principal investigator and field director, managed an archaeological survey of an APE associated with the replacement of and historic railroad bridge. Recorded archaeological sites within APE and prepared portions of technical report.

Little Lake Phase II Testing, Caltrans District 5, Little Lake, Inyo County, California, 2004. As field director, supervised Phase II testing of four sites including the ethnohistoric village of *Pagunda* near the town of Little Lake. Supervised field crews, coordinated fieldwork with Caltrans and subcontractors, and prepared portions of technical report.

Extended Phase I Testing, Caltrans District 05, Little Lake, Inyo County, California, 2003. As field director, supervised fieldwork for extended Phase I testing of one prehistoric site along U.S. Highway 395 in Inyo County. Prepared portions of technical report.

Cartago and Olancha Four-Lane Project Test Excavations, Caltrans District 05, Inyo County, California, 2002. As field director, supervised test excavations of 15 sites for the proposed widening of U.S. Highway 395 near Cartago and Olancha. Supervised all fieldwork and managed a team of 12 field archaeologists. Coordinated selected specialized studies, conducted ground stone analysis, and prepared large portions of the resulting 800+-page report.

Survey of Amtrak Second Mainline Right-of-Way, North County Transit District, Oceanside, San Diego County, California, 2002. As co-field director, managed an archaeological survey of 6.2 miles of North County Transportation District railroad right-of-way near San Onofre, California.

State Route 905 Survey, Caltrans District 11, San Diego County, California, 2002. As co-field director, conducted survey and recording of sites along the State Route 905 right-of-way in southern San Diego County. Documented three prehistoric sites within the proposed right-of-way. Created site maps and prepared site forms.

Evaluation of 11 Sites along U.S. 395, Caltrans District 05, Blackrock, Inyo County, California, 2000. As crew chief, managed 6-18 personnel, prepared paperwork and report. Made decisions surrounding site excavations in Owens Valley. Project included Phase II test excavation of numerous sites ranging in age from early to late Holocene.

Phase I Survey, Caltrans District 10, Stockton, San Joaquin County, California, 1997. As field archaeologist, conducted various survey and excavation projects for Caltrans throughout central California. Conducted survey and excavation, operated as a graduate student assistant to the District 10 archaeologist dealing with compliance issues, prepared site mapping and technical reports including Archaeological Survey Reports (ASR), Historic Properties Survey Reports (HPSR), and Negative Declarations.

Phase I Survey/TEA, Caltrans, Inyo and Mono Counties, California, 1996–1997. As field archaeologist, conducted survey of most major highways in Mono and Inyo Counties, California. Documented the distribution of all cultural material within the Caltrans right-of-way in order to determine impacts by road widening.

Tribal

Section 106 Mitigation Development and Tribal Consultation Assistance, BLM, San Diego County, California, 2011–2012. As project manager, assisted the BLM in development of Historic Properties Treatment Plan, Tribal Participation Plan, and other mitigation measures for the Tule Wind project, McCain Valley California.

Mitigative Screening, Agua Caliente Band of Cahuilla Indians, Palm Springs, Riverside County, California, 2003. As field director, supervised archaeological mitigation of an impacted burial site on the Agua Caliente Reservation. Prepared mapping of the project, coordinated field efforts with Tribal representatives, oversaw monitoring of the project, and prepared portions of the technical report.

Water/Wastewater

San Clemente Water Recycling Monitoring, City of San Clemente, Orange County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of a new water conveyance pipeline. Duties include preparation of a discovery and treatment plan.

Poseidon Resources Desalination Plant and Pipeline Monitoring, City of Carlsbad, San Diego County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of the desalination plant and a new water conveyance pipeline. Duties include preparation of a discovery and treatment plan and evaluation of archaeological discoveries.

Poseidon Resources Desalination Plant and Pipeline Wetland Mitigation Archaeological Evaluation, City of San Diego, San Diego County, California, 2013. As project manager and principal investigator, developed methods and strategies to evaluate archaeological deposits most likely related to the 1782 ethnohistoric Kumeyaay village of La Punta located within the wetland mitigation area. Project included geotechnical coring and backhoe exploration to locate and evaluate buried archaeological deposits Duties included assistance provided to the USFWS for NAGPRA consultation and implementation.

Lee Lake Cultural Resources Inventory, Lee Lake Water District, Riverside County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate and implement cultural resources inventory for the construction of a new pipeline and water storage facility.

Cultural Resources Monitoring for the City of Napa Levee Improvement Project, ACOE, Sacramento District, Sacramento, California, 2010-2011. As principal investigator, supervised archaeological monitoring requiring HAZWOPER certified archaeologists to treat historical archaeological discoveries for a levee and stormwater improvement project.

Data Recovery Excavations at the Ridge Hill Facilities Site (SDI-18472), Padre Dam Municipal Water District (PDMWD), San Diego County, California, 2009. As principal investigator, supervised data recovery of a complex late prehistoric habitation site.

San Clemente Canyon Survey, City of San Diego Metropolitan Wastewater Department, City of San Diego, San Diego County, California, 2004. As principal investigator and field director, supervised and conducted an intensive pedestrian survey of proposed access road maintenance for the San Clemente Canyon sewer line. Two cultural resources were identified. Conducted site documentation, prepared sites forms and technical report. Managed survey crew member.

Lake Murray Survey, City of San Diego Metropolitan Wastewater Department, La Mesa, San Diego County, California, 2003. As field director, conducted survey of proposed trunk sewer replacement in La Mesa. Prepared portions of the technical report.

Imperial Irrigation District's Phase II Testing, Imperial Irrigation District, Imperial County, California, 2003. As field director, supervised Phase II testing of eight sites in the Colorado Desert. Managed field crews, conducted test excavations, and prepared site documentation and portions of the technical report.

Carmel Valley Archaeological Monitoring, City of San Diego Metropolitan Wastewater Department, Carmel Valley, San Diego County, California, 2002. As field monitor for pre-trenching for placement of sewer line, conducted monitoring and wrote portions of technical report.

EIR/EIS Preparation

Dr. Hale currently assists in the preparation of technical descriptions and analyses for environmental impact statements and reports at the state and federal levels for Dudek projects. Examples of completed environmental sections include those prepared for the Yokohl Ranch, Rio Mesa Solar, Soitec Rugged and Tierra Del Sol Solar, SDG&E's Wood to Steel project, and various others. More details are available upon request.

Other Relevant Experience

Training

- 2012 - Accounting and Finance for Non-Financial Managers, UCSD Rady School of Business Management
- 2010 - ESOP Planning and Management, UCSD Rady School of Business Management
- 2004 - Ground Penetrating Radar Field Methods and Interpretation Certificate
- 2002, 2010 - GPS Field Methods Training, ASC Scientific

Teaching

- 2008 - Assistant Professor, Archaeology, U.C. Davis
- 2008 - Instructor/ Principal Investigator, 2008 UC Davis Archaeology Field School, Vandenberg Air Force Base, California.
- 2005–2008 – Level III Teaching Assistant, U.C. Davis; taught discussion sections/ lectures for Human Evolution, Archaeology, and Human Ecology
- 1998–1999 – Acted as Public Education Coordinator for the Museum of Anthropology at UC Davis; included instructing a course teaching archaeology students how to inform the public about the value of anthropology through in-class presentations, exhibits, and the building of 'teaching trunks' for people in grades 1–12 of primary and secondary education
- 1997–1998 - Substitute teacher with an Emergency Credential in the Woodland and Davis Joint Unified School Districts for grades K–12, all subjects excluding foreign languages
- 1997–present – Regularly perform presentations about the value of archaeology in classrooms at the level of the grades 1–12
- 1996 – Teaching assistant at the U.C. Davis archaeological field school; job duties included student management and instruction in the methods of excavation and survey.

Publications

Selected Technical Reports

Hale, Micah J. 2010. "Limited Archaeological Excavations at SDI-4669 (SDM-W-12A)." In Advance of Geotechnical Coring, University House Rehabilitation Project, University of California at San Diego, La Jolla, California. Submitted to Ione Stiegler Architecture, La Jolla, California. Report on file at South Coastal Information Center, SDSU.

Hale, Micah J. 2010. Results of Archaeological Monitoring for Meteorological Masts in McCain Valley, San Diego County, California. Prepared for HDR Engineering Inc.

Hale, Micah J. 2007. Archaeological Survey of the Silver Lake Recreation Area, El Dorado Irrigation District, El Dorado County, California. Prepared for Trish Fernandez, El Dorado Irrigation District, El Dorado County, California.

Hale, Micah J. 2005. "Ground Stone Analysis." In From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California, by Micah J. Hale and Mark S. Becker. Report submitted to Southwest Division of Naval Facilities.

Hale, Micah J. 2005. Cultural Resources Inventory for the Proposed San Diego Model Schools Development Project. ASM Affiliates Inc., Carlsbad, California. Prepared for the City of San Diego, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the Replacement of Bridge 230.6 over Agua Hedionda Lagoon, San Diego County, California. Submitted to North County Transit District, San Diego County, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the Gawle Property, San Diego County, California. Submitted to Helix Environmental for the City of San Diego.

Hale, Micah J. 2004. Cultural Resources Inventory for the Hines Nursery, San Diego County, California. Submitted to Hines Nurseries, Rainbow Valley, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the San Clemente Canyon Trunk Sewer Maintenance and Access Routes, San Diego County, California. Submitted to Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the Montezuma Trunk Sewer Replacement, San Diego County, California. Submitted to Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the Oceanside Hotel EIR, San Diego County, California. Submitted to Dudek for the City of Oceanside, California.

Hale, Micah J. 2004. Historic Resources Mitigation Monitoring of the El Cuervo Norte Project, San Diego County, California. Submitted to the City of San Diego.

Hale, Micah J. 2004. Emergency Test Excavations of an Exposed Olla, Riverside County, California. Submitted to BLM, Riverside County, California.

Hale, Micah J. 2004. Cultural Resources Monitoring for Geotechnical Coring Related to the All-American Canal Lining Project, Imperial County, California. Submitted to Imperial Irrigation District, Imperial County, California.

Hale, Micah J. 2004. Cultural Resources Monitoring of Geotechnical Coring Related to the Coachella Canal Lining Project, Riverside County, California. Submitted to Imperial Irrigation District, Riverside County, California.

Hale, Micah J. 2004. "Ground and Battered Stone Analysis." In Data Recovery Investigations at the Eucalyptus Site, CA-SDI-6954, San Diego County, California. Prepared by Don Laylander, ASM Affiliates Inc., Carlsbad, California. Submitted to EDAW, Inc.

Hale, Micah J. 2003. Cultural Resources Inventory for the Linda Vista Drive Re-Alignment Alternatives, City of San Marcos, California. Submitted to Nolte for the City of San Marcos.

Hale, Micah J. 2003. Cultural Resources Inventory for the Lake Murray Trunk Sewer Replacement, San Diego County, California. Submitted to the Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2000. Cultural Resource Monitoring Report. Jones and Stokes Associates Inc. Prepared for AT&T Corp., Atlanta, Georgia, for the AT&T cable removal project from Lucin, Utah, to Red Bluff, California.

Hale, Micah J. 2000. "Ground and Battered Stone Analysis." In Report on Excavations at Four Locations in the Lead Mountain Vicinity of the 29-Palms Marine Base, edited by Mark Basgall. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Ground and Battered Stone Analysis." In Report on Excavations at CA-MER-295, edited by Mark Basgall and R. Bethard. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Invertebrate Analysis." In Report on Excavations at CA-MER-295, edited by Mark Basgall and Mark Giambastiani. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Site Reports for Sites SBR-9415 and SBR-9420." In Report on Excavations at Lead Mountain in Twentynine Palms Marine Corps Air Ground Combat Training Center, edited by Mark Basgall. Sacramento Archaeological Research Center.

Hale, Micah J. 1999. "Ground and Battered Stone Analysis." In Muddle in the Middle: Phase II Excavations of Five Sites in Kern County, California, edited by Mark Basgall. Prepared for V. Levulett, Environmental Management, Caltrans District 5, San Luis Obispo. Sacramento Archaeological Research Center.

Hale, Micah J., and Brad Comeau. 2009. Data Recovery Excavations at CA-SDI-18472 for the Proposed Padre Dam Municipal Water District Secondary Connection Project (Ridge Hill Facilities) Johnstown, San Diego County, California. Prepared for Mr. Albert Lau, Engineering Manager, Padre Dam Municipal Water District.

Hale, Micah, Brad Comeau, and Chad Willis. 2010. Class II and Class III Cultural Resources Inventory Report for the Tule Wind Project, McCain Valley, San Diego County, California. Prepared for HDR Engineering Inc. Report on file at the South Coastal Information Center, SDSU.

Hale, Micah J., and John R. Cook. 2005. Results of Ground Penetrating Radar Investigations at CA-SDI-10148 in the Forester Creek Biological Mitigation Site, San Diego County, California. With contributions by Jeffrey S. Patterson. Prepared for Chris White, Caltrans District 11.

Hale, Micah J., and Mark S. Becker. 2006. From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California. ASM Affiliates, Carlsbad, California. Submitted to Southwest Division of Naval Facilities.

Hale, Micah J., and Mark A. Giambastiani. 2010. A Cultural Resources Inventory for Sample Surveys in Selected Training Areas, Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, San Bernardino County, California. Prepared for Marine Air Ground Task Force Training Command, Natural Resources and Environmental Affairs, Twentynine Palms, California.

Hale, Micah, and Mark Giambastiani. 2010. Archaeological Resources Survey Report Aerial Maneuver Zone (AMZ) Project at the Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, California, San Bernardino County, California. Prepared for Marine Air Ground Task Force Training Command, Natural Resources and Environmental Affairs, Twentynine Palms, California.

Hale, Micah, and Mark Giambastiani. 2010. An Archaeological Survey of 3,650 Acres at Cole Flat, Naval Air Weapons Station (NAWS), China Lake, California. Prepared for Mike Baskerville, Base Archaeologist, NAWS China Lake, California.

Hale, Micah J., Mark Giambastiani, Michael Richards, and David Iversen. 2009. Phase II Cultural Resource Evaluations at 51 Archaeological Sites in Management Regions 1A, 1B, 2B, 2C, and 3E, Bissell Hills and Paiute Ponds, Edwards Air Force Base, Kern and Los Angeles Counties, California. Prepared for U.S. Army Corps of Engineers under contract numbers W91238-07-F-0051 and W91238-07-F-0052.

Basgall, Mark, Lynn Johnson, and Micah Hale. 2002. An Evaluation of Four Archaeological Sites in the Lead Mountain Training Area, Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, California. Prepared for United States Marine Corps Air Ground Combat Center, Twentynine Palms, California. Prepared by Archaeological Research Center, Institute of Archaeology and Cultural Studies, Department of Anthropology, California State University, Sacramento.

Becker, Mark S., and Micah J. Hale. 2004. "Flaked Stone and Ground Stone Artifact Analysis." In Phase II Archaeological Testing and Evaluation of CA-INY-3647, CA-INY-3650/H, CA-INY-3826, and P-14-7356, Little Lake Rehabilitation, U.S. 395, Inyo County, California, edited by Brian Byrd and Seetha Reddy, ASM Affiliates. Prepared for Caltrans District 6, Fresno.

Byrd, Brian F., and Micah J. Hale. 2005. Testing and Evaluation of CA-SDI-13,930 on Camp Pendleton Marine Corps Base, San Diego County, California: A Paleoenvironmental Approach. ASM Affiliates, Carlsbad, California. Prepared for Southwest Division Naval Facilities Engineering Command.

Byrd, Brian F., and Micah J. Hale. 2004. Final Report on the Rose-Arizone Site Survey and Documentation, San Clemente Island. Prepared for Dr. Andrew Yatsko, NAVFAC SW, South Bay Area Focus Team.

Byrd, Brian F., and Micah J. Hale. 2004. Final Report on the San Clemente Island Protective Signing and Maintenance Project. Prepared for Dr. Andrew Yatsko, NAVFAC SW, South Bay Area Focus Team.

Byrd, Brian F., and Micah J. Hale. 2004. Final Report on the San Clemente Island Road Improvement Survey. Prepared for Dr. Andrew Yatsko, NAVFAC SW, South Bay Area Focus Team.

Byrd, Brian F., Micah J. Hale, and Sinéad Ní Ghabhláin. 2004. "Archaeological Testing at INY-3647." In Phase II Archaeological Testing and Evaluation of CA-INY-3647, CA-INY-3650/H, CA-INY-3826, and P-14-7356, Little Lake Rehabilitation, U.S. 395, Inyo County, California, edited by Brian Byrd and Seetha Reddy, ASM Affiliates. Prepared for Caltrans District 6, Fresno.

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Editorial Reviewer

Hale, Micah J. 2011. Editorial Reviewer, *Journal of California Archaeology*, Left Coast Press, California.

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Presentations

Hale, Micah J. 2012. *The Data Matter: Contributions of the Sacramento State Archaeological Research Center*. Presented at the 2012 Society for California Archaeology Meetings, San Diego, California.

Hale, Micah J. 2012. *Andy Yatsko, the Human Transit: Celebrating His Lifetime Contributions*. Presented at the 2012 Society for California Archaeology Meetings, San Diego, California.

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Hale, Micah J. 2011. *A 10,000 Year Old Habitation at the University House, La Jolla: Implications for Trans-Holocene Socioeconomic Stability in San Diego*. Presented at the 2011 Society for American Archaeology Meetings, Sacramento, California.

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Hale, Micah J. 2005. *Investigating the Role of Acorns in Southern California Hunter-Gatherer Economies*. Guest Speaker at the Antelope Valley Archaeological Society Meeting.

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Hale, Micah J. 2003. *The Organization of Subsistence Technology in Southern California During the Holocene.* Guest Speaker for the San Diego County Archaeological Society, January 28, 2003, San Diego.

Hale, Micah J. 2002. *Prehistory Along the Southwestern Shore of Owens Lake: Preliminary Results from the Cartago-Olancha Project.* Presented at the 2002 Northern California Data Sharing Meetings, Society for California Archaeology, Santa Cruz, California.

Hale, Micah J. 2002. *Ground and Battered Stone Along the Western Shores of Owens Lake.* Presented at the 2002 Northern California Data Sharing Meetings, Society for California Archaeology, Santa Cruz, California.

Hale, Micah J. 2001. *Technological and Social Organization during the Millingstone Horizon of Southern California*. Presented at the Society for California Archaeology Annual Meeting, Modesto.

Hale, Micah J. 1999. *The Analysis Method of Formatting Presentations and Lesson Plans in Archaeology*. Presented at the Society for American Archaeology 64th Annual Meeting, Chicago, Illinois.

Hale, Micah J. 1998. *A Practical and Effective Method for Teaching Archaeology to the Public*. Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

Awards/Commendations

- 2010 – NAVFAC SW, Camp Pendleton, Research Grant, $59,000
- 2008 – U.S. Air Force, Vandenberg AFB, Radiocarbon Grant, $25,000
- 2008 – Fieldwork Fellowship, Graduate Studies, UC Davis, $2,010
- 2007 – Fieldwork Fellowship, Graduate Studies, UC Davis, $1,800
- 2006 – Fieldwork Fellowship, Graduate Studies, UC Davis, $5,650
- 2005–2009 – Graduate Fee Fellowship/Stipend, UC Davis, $74,500

Clearances

- Department of Defense (DoD) High-Security Clearance for SPAWAR, Naval Base Point Loma, NALF San Clemente Island, Vandenberg Air Force Base, MCAGCC 29 Palms, Edwards Air Force Base, NAWS China Lake, Yuma Proving Grounds, and MCB Camp Pendleton

APPENDIX E

Special Studies

Beta Analytic Inc.
4985 SW 74 Court
Miami, Florida 33155 USA
Tel: 305 667 5167
Fax: 305 663 0964
Beta@radiocarbon.com
www.radiocarbon.com

Consistent Accuracy . . .
. . . Delivered On-time

September 22, 2014

Mr. Brad Comeau
Dudek
605 Third Street
Encinitas, CA 92094
USA

RE: Radiocarbon Dating Results For Samples CAT 615, CAT 617, CAT 618, CAT 622, CAT 623, CAT 626

Dear Mr. Comeau:

Enclosed are the radiocarbon dating results for six samples recently sent to us. As usual, the method of analysis is listed on the report with the results and calibration data is provided where applicable. The Conventional Radiocarbon Ages have all been corrected for total fractionation effects and where applicable, calibration was performed using 2013 calibration databases (cited on the graph pages).

The web directory containing the table of results and PDF download also contains pictures, a cvs spreadsheet download option and a quality assurance report containing expected vs. measured values for 3-5 working standards analyzed simultaneously with your samples.

Reported results are accredited to ISO-17025 standards and all chemistry was performed here in our laboratories and counted in our own accelerators here in Miami. Since Beta is not a teaching laboratory, only graduates trained to strict protocols of the ISO-17025 program participated in the analyses.

As always Conventional Radiocarbon Ages and sigmas are rounded to the nearest 10 years per the conventions of the 1977 International Radiocarbon Conference. When counting statistics produce sigmas lower than +/- 30 years, a conservative +/- 30 BP is cited for the result.

When interpreting the results, please consider any communications you may have had with us regarding the samples. As always, your inquiries are most welcome. If you have any questions or would like further details of the analyses, please do not hesitate to contact us.

Thank you for prepaying the analyses. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Darden Hood

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Brad Comeau — Report Date: 9/22/2014

Dudek — Material Received: 9/18/2014

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 390513	4490 +/- 30 BP	-22.5 o/oo	4530 +/- 30 BP
SAMPLE : CAT 615			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 3360 to 3260 (Cal BP 5310 to 5210) and Cal BC 3245 to 3100 (Cal BP 5195 to 5050)			
Beta - 390514	70 +/- 30 BP	-20.9 o/oo	140 +/- 30 BP
SAMPLE : CAT 617			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1665 to 1780 (Cal BP 285 to 170) and Cal AD 1795 to 1895 (Cal BP 155 to 55) and Cal AD 1905 to Post 1950 (Cal BP 45 to Post 0)			
Beta - 390515	4530 +/- 30 BP	-20.0 o/oo	4610 +/- 30 BP
SAMPLE : CAT 618			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 3495 to 3435 (Cal BP 5445 to 5385) and Cal BC 3375 to 3350 (Cal BP 5325 to 5300)			
Beta - 390516	4470 +/- 30 BP	-21.5 o/oo	4530 +/- 30 BP
SAMPLE : CAT 622			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 3360 to 3260 (Cal BP 5310 to 5210) and Cal BC 3245 to 3100 (Cal BP 5195 to 5050)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

BETA ANALYTIC INC.
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MIAMI, FLORIDA, USA 33155
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beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Brad Comeau

Report Date: 9/22/2014

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 390517	4730 +/- 30 BP	-19.7 o/oo	4820 +/- 30 BP
SAMPLE : CAT 623			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 3650 to 3630 (Cal BP 5600 to 5580) and Cal BC 3580 to 3530 (Cal BP 5530 to 5480)			
Beta - 390518	4510 +/- 30 BP	-23.0 o/oo	4540 +/- 30 BP
SAMPLE : CAT 626			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 3365 to 3265 (Cal BP 5315 to 5215) and Cal BC 3240 to 3105 (Cal BP 5190 to 5055)			

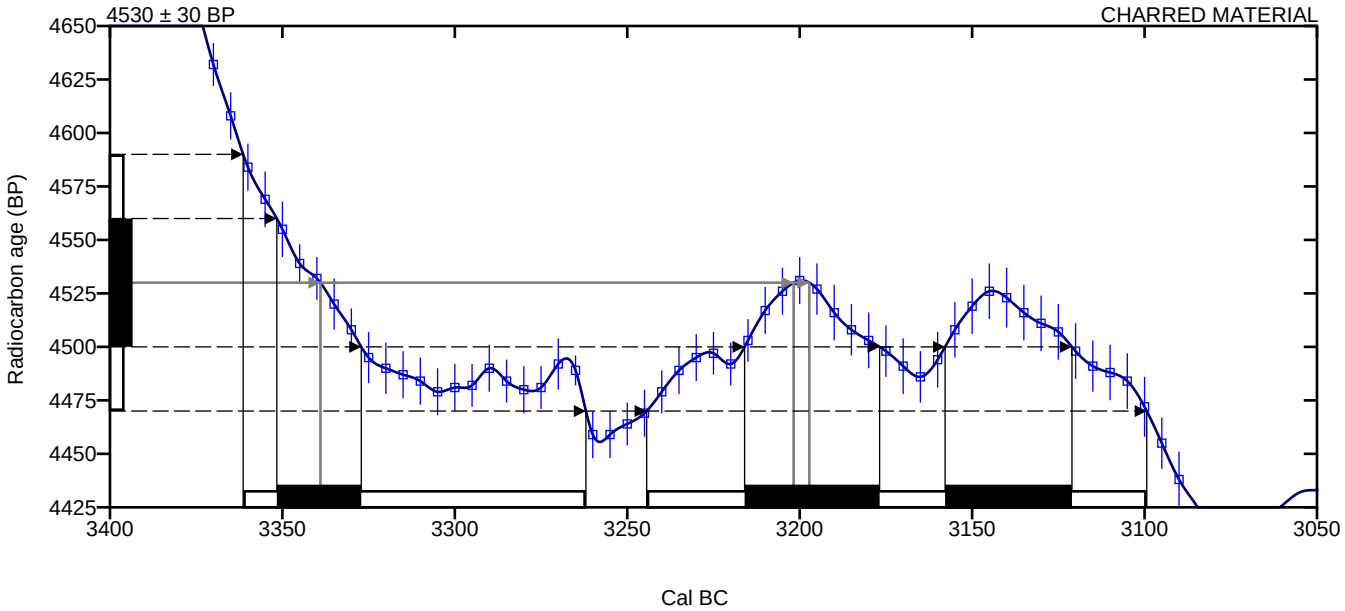
Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -22.5 o/oo : lab. mult = 1)

Laboratory number	**Beta-390513**
Conventional radiocarbon age	**4530 ± 30 BP**
2 Sigma calibrated result **95% probability**	**Cal BC 3360 to 3260 (Cal BP 5310 to 5210)** **Cal BC 3245 to 3100 (Cal BP 5195 to 5050)**
Intercept of radiocarbon age with calibration curve	Cal BC 3340 (Cal BP 5290) Cal BC 3200 (Cal BP 5150) Cal BC 3195 (Cal BP 5145)
1 Sigma calibrated results 68% probability	Cal BC 3350 to 3325 (Cal BP 5300 to 5275) Cal BC 3215 to 3175 (Cal BP 5165 to 5125) Cal BC 3160 to 3120 (Cal BP 5110 to 5070)



Database used

INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

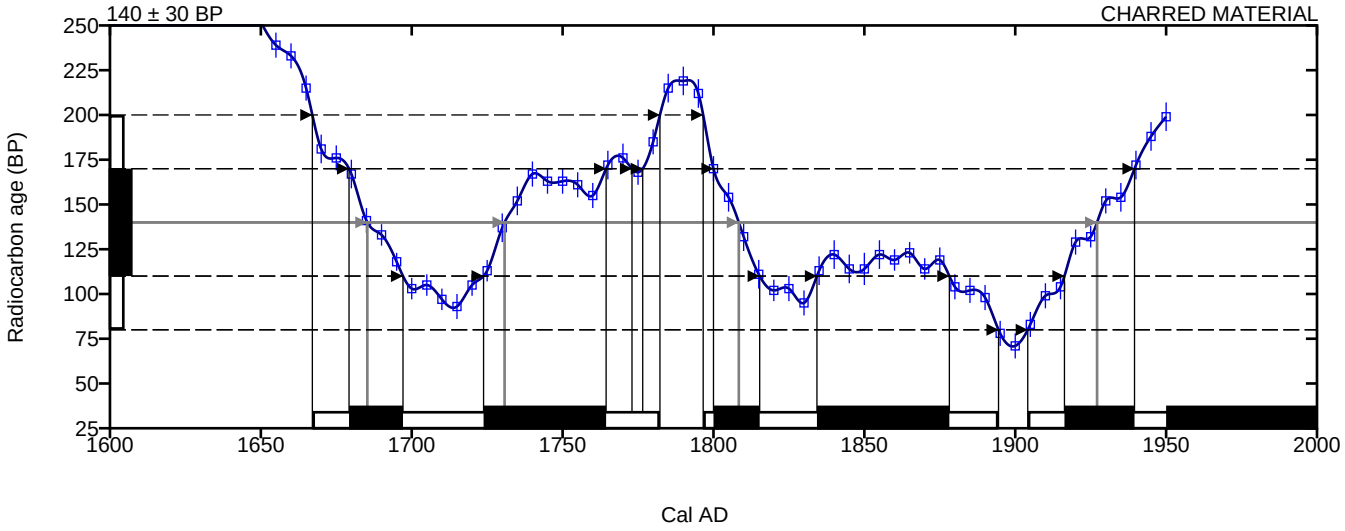
References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0– 50,000 years cal BP. Radiocarbon 55(4):1869– 1887.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -20.9 o/oo : lab. mult = 1)

Laboratory number	**Beta-390514**
Conventional radiocarbon age	**140 ± 30 BP**
2 Sigma calibrated result 95% probability	**Cal AD 1665 to 1780 (Cal BP 285 to 170)** **Cal AD 1795 to 1895 (Cal BP 155 to 55)** **Cal AD 1905 to Post 1950 (Cal BP 45 to Post 0)**
Intercept of radiocarbon age with calibration curve	Cal AD 1685 (Cal BP 265) Cal AD 1730 (Cal BP 220) Cal AD 1810 (Cal BP 140) Cal AD 1925 (Cal BP 25) Post AD 1950 (Post BP 0)
1 Sigma calibrated results 68% probability	Cal AD 1680 to 1695 (Cal BP 270 to 255) Cal AD 1725 to 1765 (Cal BP 225 to 185) Cal AD 1800 to 1815 (Cal BP 150 to 135) Cal AD 1835 to 1880 (Cal BP 115 to 70) Cal AD 1915 to 1940 (Cal BP 35 to 10) Post AD 1950 (Post BP 0)



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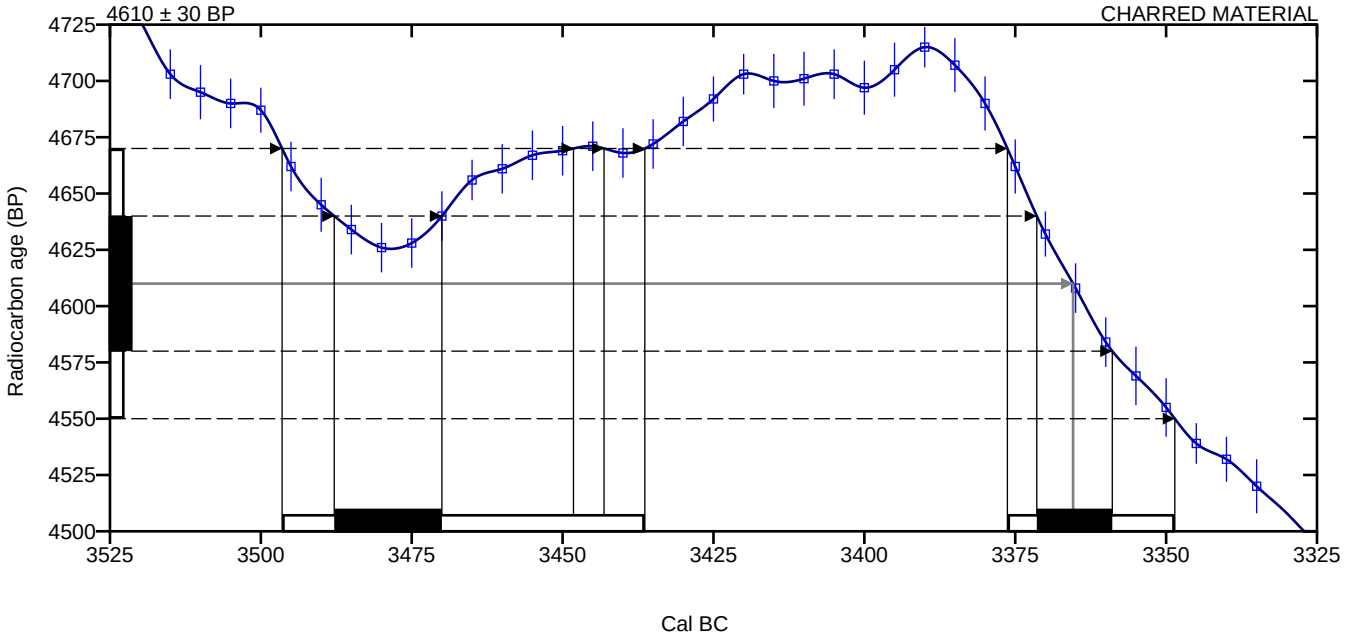
Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0– 50,000 years cal BP. Radiocarbon 55(4):1869– 1887.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -20 o/oo : lab. mult = 1)

Laboratory number	**Beta-390515**
Conventional radiocarbon age	**4610 ± 30 BP**
2 Sigma calibrated result **95% probability**	**Cal BC 3495 to 3435 (Cal BP 5445 to 5385)** **Cal BC 3375 to 3350 (Cal BP 5325 to 5300)**
Intercept of radiocarbon age with calibration curve	Cal BC 3365 (Cal BP 5315)
1 Sigma calibrated results 68% probability	Cal BC 3490 to 3470 (Cal BP 5440 to 5420) Cal BC 3370 to 3360 (Cal BP 5320 to 5310)



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A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

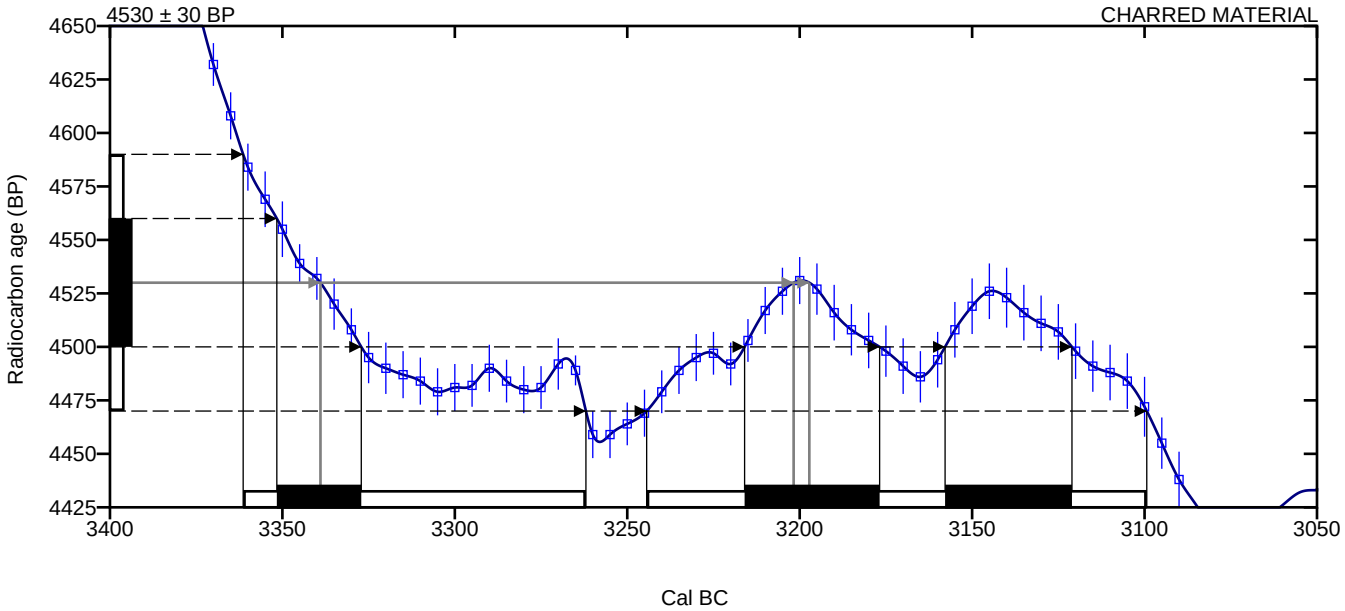
References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0– 50,000 years cal BP. Radiocarbon 55(4):1869– 1887.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -21.5 o/oo : lab. mult = 1)

Laboratory number	**Beta-390516**
Conventional radiocarbon age	**4530 ± 30 BP**
2 Sigma calibrated result **95% probability**	**Cal BC 3360 to 3260 (Cal BP 5310 to 5210)** **Cal BC 3245 to 3100 (Cal BP 5195 to 5050)**
Intercept of radiocarbon age with calibration curve	Cal BC 3340 (Cal BP 5290) Cal BC 3200 (Cal BP 5150) Cal BC 3195 (Cal BP 5145)
1 Sigma calibrated results 68% probability	Cal BC 3350 to 3325 (Cal BP 5300 to 5275) Cal BC 3215 to 3175 (Cal BP 5165 to 5125) Cal BC 3160 to 3120 (Cal BP 5110 to 5070)



Database used

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References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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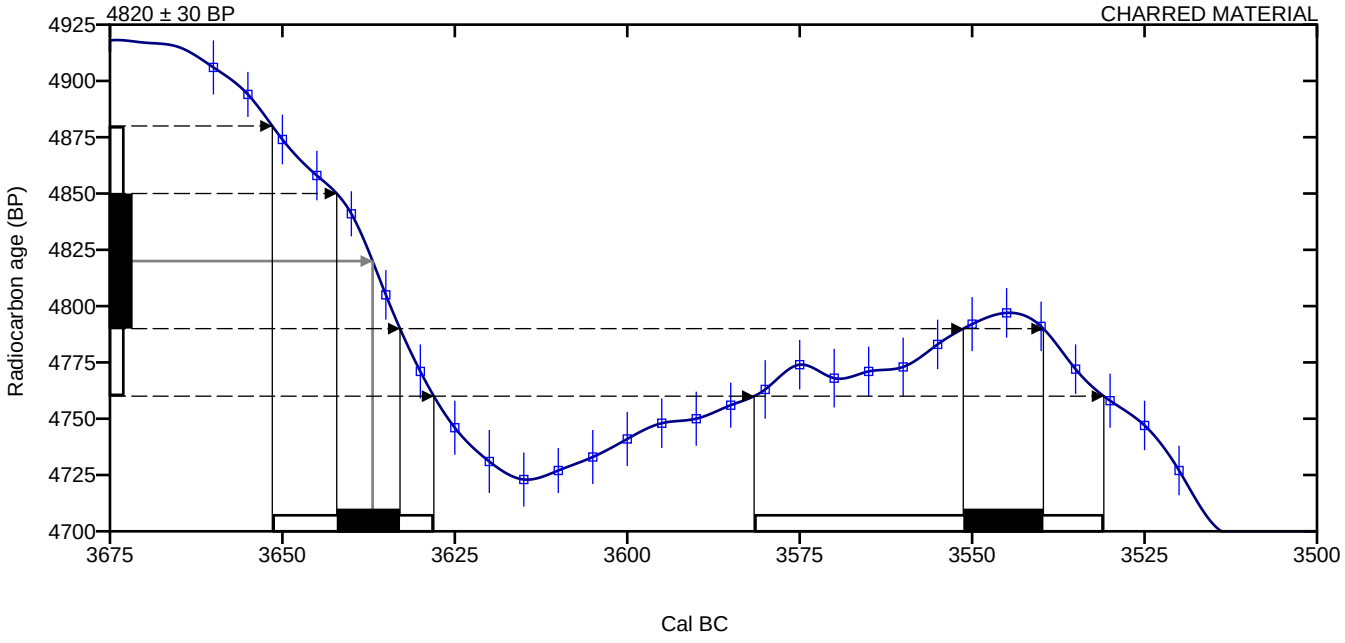
Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0– 50,000 years cal BP. Radiocarbon 55(4):1869– 1887.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -19.7 o/oo : lab. mult = 1)

Laboratory number	**Beta-390517**
Conventional radiocarbon age	**4820 ± 30 BP**
2 Sigma calibrated result **95% probability**	**Cal BC 3650 to 3630 (Cal BP 5600 to 5580)** **Cal BC 3580 to 3530 (Cal BP 5530 to 5480)**
Intercept of radiocarbon age with calibration curve	Cal BC 3635 (Cal BP 5585)
1 Sigma calibrated results 68% probability	Cal BC 3640 to 3635 (Cal BP 5590 to 5585) Cal BC 3550 to 3540 (Cal BP 5500 to 5490)



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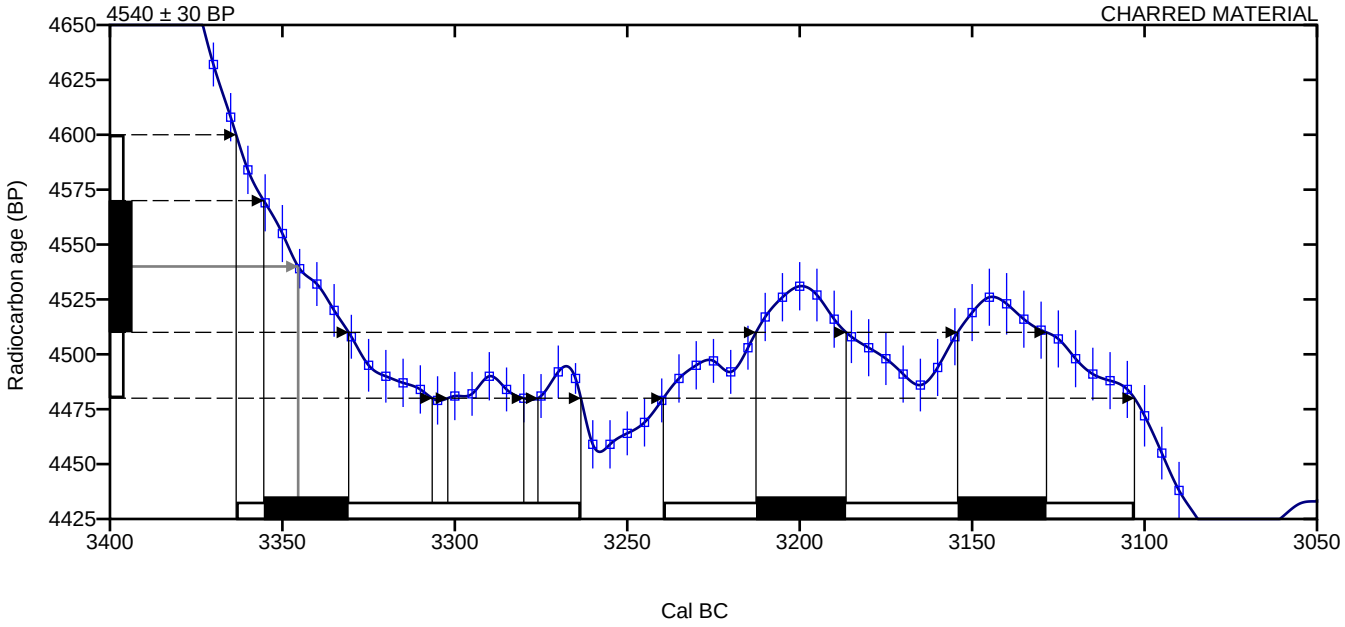
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -23 o/oo : lab. mult = 1)

Laboratory number	**Beta-390518**
Conventional radiocarbon age	**4540 ± 30 BP**
2 Sigma calibrated result **95% probability**	**Cal BC 3365 to 3265 (Cal BP 5315 to 5215)** **Cal BC 3240 to 3105 (Cal BP 5190 to 5055)**
Intercept of radiocarbon age with calibration curve	Cal BC 3345 (Cal BP 5295)
1 Sigma calibrated results 68% probability	Cal BC 3355 to 3330 (Cal BP 5305 to 5280) Cal BC 3215 to 3185 (Cal BP 5165 to 5135) Cal BC 3155 to 3130 (Cal BP 5105 to 5080)



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Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0– 50,000 years cal BP. Radiocarbon 55(4):1869– 1887.

APPENDIX F (CONFIDENTIAL)

Human Remains Documentation