Appendix J

Cultural and Paleontological Resources

Archaeological Resources Assessment

Newport Banning Ranch
Newport Beach, California

Prepared for

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TESTING AND EVALUATION OF THE CULTURAL RESOURCES OF NEWPORT BANNING RANCH NEWPORT BEACH, CALIFORNIA

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TABLE OF CONTENTS

Section **Page**

LIST OF TABLES

Table **Page**

LIST OF FIGURES

LIST OF EXHIBITS

LIST OF APPENDICES

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SECTION 1.0 MANAGEMENT SUMMARY

1.1 PURPOSE AND SCOPE

BonTerra Consulting completed a Phase II test excavation and evaluation of archaeological sites CA-ORA-148, CA-ORA-839, CA-ORA-843, CA-ORA-844, CA-ORA-845, CA-ORA-906, CA-ORA-1599, CA-ORA-1600, CA-ORA-1601H, CA-ORA-1602H, and CA-ORA-1610H for the proposed Newport Banning Ranch Project located in the City of Newport Beach and unincorporated Orange County, California, within the City of Newport Beach's Sphere of Influence. All work was completed under the cultural resources provisions of the California Environmental Quality Act (CEQA) and the City of Newport Beach. This study would be a technical appendix to the Environmental Impact Report (EIR) being developed by BonTerra Consulting for the Project. The study was also done to federal level standards (Section 106 of the National Historic Preservation Act [NHPA]) because of the possibility of a future federal nexus.

This Phase II report addresses the disposition and significance of the 11 unevaluated archaeological sites on the Project site. They are being evaluated for their eligibility for listing on the California Register of Historical Resources (CRHR), and by extension, on the National Register of Historic Places (NRHP). Eligible sites warrant further consideration in the planning process. The format of this report follows *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Office of Historic Preservation 1990).

Data collected through survey, controlled excavation, and archival research was analyzed and used to evaluate the significance of each site. Pursuant to Section 15064.5(a)(3) of the CEQA Guidelines, a site is considered historically significant if it meets one of the four criteria for listing on the California Register of Historical Resources (CRHR) (see "Regulatory Setting" below). Archaeological sites are typically evaluated under Criterion D, which assesses the potential of each site to yield information important in the State's prehistory.

Therefore, the primary goal of site testing at Newport Banning Ranch is to establish the dimensions, chronology, density, diversity, and integrity of the archaeological sites and to compare them to other local and regional sites in order to determine whether any meet the statutory requirements of significance under CEQA.

1.2 DATES OF INVESTIGATION

BonTerra Consulting Archaeologists Patrick Maxon and Christopher Drover, PhD, both Registered Professional Archaeologist (RPA), completed an initial site walk to formulate excavation plans on May 13, 2009. Site excavations were conducted under the direct supervision and direction of Dr. Drover from May 27, 2009 through June 26, 2009. This report was completed in August 2009.

1.3 FINDINGS OF THE INVESTIGATION

Hand excavation of a varying number of Shovel Test Pits (STPs) and 1 x 1 meter units at 10 of the 11 archaeological sites on the Newport Banning Ranch Project site resulted in cultural material recovery and permitted significance evaluations. Table 1 summarizes the results and recommendations of the study for each archaeological site.

TABLE 1
RESULTS AND RECOMMENDATIONS OF THE STUDY FOR EACH ARCHAEOLOGICAL SITE

Site CA-	Description	Condition	Prior Testing	Current Testing	CEQA/Section 106 Eligibility Recommendation
ORA-148	Shell scatter	Destroyed	Van Horn (1982)	None	Not eligible
ORA-839	Minor residential base	Good	Van Horn (1980)	8 Control Units	**Eligible**
ORA-843	Shell scatter	Poor	Van Horn (1982)	8 STPs	Not eligible
ORA-844	Minor residential base	Locus A: Satisfactory Locus B: Poor	No	1 Control Unit; 10 STPs	**Eligible (Locus B)**
ORA-845	Shell scatter	Poor	Van Horn (1982)	10 STPs	Not eligible
ORA-906	Major residential base	Good	No	1 Control Unit	**Eligible**
ORA- 1599	Lithic scatter	Poor	No	6 STPs	Not eligible
ORA-1600	Lithic scatter	Poor	No	7 STPs	Not eligible
ORA-1601H	Trash scatter	Poor	No	2 STPs	Not eligible
ORA-1602H	Trash scatter	Poor	No	1 STP	Not eligible
ORA-1610H	Gun emplacement	Destroyed	No	None	Not eligible
STP: Shovel Test Pits. An approximately 40-cm by 40-cm hand-excavated unit used to detect presence/absence of resources.					

1.4 INVESTIGATION CONSTRAINTS

Much disturbance has occurred throughout the property. The Newport Oil Company has developed and drilled on the property for many years. These activities have heavily disturbed all of the recorded cultural resources on the Project site. Disturbances that have affected cultural resources include road building; quarrying; maintenance; preparation, closure, and rehabilitation of drilling pads; and other activities. Fill soil/sediment, acquired over time from numerous locations on the property, was often used to create roads and pad sites in the lower wetlands. In some cases, these disturbances have resulted in isolated cultural loci within sites as consequences of grading rather than cultural activities.

1.5 RECOMMENDATIONS

BonTerra Consulting recommends that CA-ORA-839; CA-ORA-844, Locus B; and CA-ORA-906 be deemed *eligible* for listing in the CRHR or NRHP. Locus A of CA-ORA-844 and the remaining eight archaeological sites on the Project site are recommended *not eligible* for listing and require no further study aside from observation during grading.

The CEQA Guidelines (§15126.4[b][3]) directs public agencies, wherever feasible, to avoid damaging historical resources of an archaeological nature, preferably by preserving the resource(s) in place. Several possibilities suggested by the CEQA Guidelines include (1) planning construction to avoid the site; (2) incorporating the site into open space; (3) capping the site with a chemically stable soil; and/or (4) deeding the site into a permanent conservation easement.

In this analysis, the location and nature of each identified *eligible* archaeological site was compared to the proposed Newport Banning Ranch development plans. Mitigation measures were developed for all the sites' resources, but particular attention is given to those sites that could potentially suffer substantial adverse change or adverse impacts as a result of the proposed Project.

The following is applicable for the three sites deemed eligible for listing on the CRHR or the NRHP as historical resources. Only CA-ORA-839 is also considered a unique archaeological resource. Mitigation is the same for both types of resources.

1.5.1 CA-ORA-839

It appears that CA-ORA-839 would suffer no direct impacts as a result of the proposed development (Figure 4). Although the construction of Bluff Road to 19th Street would extend north into the vicinity of the site, the road would be constructed along the bottom and to the west of the bluffs, while the site lies on the bluff top to the east. In the event that Bluff Road is not constructed, no direct impacts to CA-ORA-839 are anticipated. Direct impacts from the removal of oil field infrastructure, however, could impact the site, and the increased population on the site as a result of future development, could cause further damage to the site over time. With respect to site development, it should be possible to preserve the vast majority of the site in place in perpetuity to avoid further disturbance to it.

It should be possible to preserve the vast majority of the site in place in perpetuity to avoid further disturbance to it. However, it appears that the planned removal of oil field infrastructure may impact portions of the site. In that event, the site shall undergo a data recovery excavation of those areas that will be impacted. Data recovery shall be sufficient to collect a representative sample of site constituents, including organic materials, to permit additional absolute dating of the deposit.

In addition, secondary impacts (e.g., increased foot traffic, erosion) could occur at the site after the Project has been constructed; therefore, the site shall be capped with chemically stable soil to preserve it in perpetuity. During grading operations, excess dirt shall be placed on the site to a sufficient depth to protect the deposit, but not cause unintended damage to it. Shallow-rooted vegetation (such as native coastal sage scrub) may be planted on the new surface. To ensure the integrity of the archaeological deposit, the current ground surface shall initially be covered with some form of horizon marker (e.g., by *Mirafi,* a polypropylene geotextile) to prevent the deposit from mixing with the covering material and to serve as a marker of the site if the covering is ever removed. The capping methodology relies on guidance provided by the National Park Service's Brief #5 *Intentional Site Burial: A Technique to Protect Against Natural or Mechanical Loss* (NPS 1989, revised 1991). Refer to Recommendation/Mitigation Measure 8.1.2.

1.5.2 CA-ORA-844 Locus B

CA-ORA-844B is located on a hillside transected by two erosional cuts exceeding six feet in depth. The western side of the site is absent due to oil pad construction. These factors have left little midden from the original site intact at this location, but a surprisingly robust sample was recovered through the test excavation.

CA-ORA-844B is not expected to be directly impacted by development (Figure 9). Oil infrastructure removal activities that would occur prior to grading are expected to adversely impact portions of the site. Indirect impacts from additional erosion of the unstable surface and increased population in the vicinity of the site as a result of the future development could cause further damage over time.

Both capping and data recovery excavation are viable options for treating the site; however, because it has been disturbed by erosion and oil extraction activities, capping the deposit would be difficult and possibly more expensive and time consuming with less desirable results, than data recovery excavation. Considering these circumstances, two options are provided: (1) successful capping of the site, while likely difficult to accomplish, would be designed to protect the site in perpetuity or, preferably, (2) data recovery shall be undertaken prior to grading to collect the scientifically consequential data that is present in the site since it appears that only a small, yet important, portion of the site remains. Because of the limited size of this site, this option would be able to remove and analyze the site in its entirety. Refer to Recommendation/Mitigation Measure 8.1.4.

1.5.3 CA-ORA-906

CA-ORA-906 would be directly impacted as a result of development as well as oil infrastructure removal. The site would likely be completely destroyed by construction of Bluff Road. Data recovery excavation at the site shall be completed prior to Project grading and shall be designed to recover the consequential data present in the site and to remove the site constituents. Mitigation shall be in the form of data recovery excavation to collect the scientifically consequential data that the site retains prior to its destruction by Project grading. Refer to Recommendation/Mitigation Measure 8.1.6.

1.5.4 Cultural Resources Monitoring

Section 21083.2(i) of the CEQA Statutes and Section 15064.5(f) of the CEQA Guidelines provide for the accidental discovery of historical resources during construction. Based on the fact that prehistoric, historic and modern peoples made use of the property, it is clear that cultural resources still exist within sites on Newport Banning Ranch, and it is not unlikely that previously undetected cultural material and unknown archaeological sites could remain in the subsurface of the Project site. Therefore, it is recommended that a qualified Archaeologist who meets the Secretary of the Interior's Standards for Archaeologists (NPS 1983) and Native American Tribal Monitor(s) of the local Juaneño and/or Gabrielino tribal groups (identified by the Native American Heritage Commission [NAHC]), who have historical ties to the Project area monitor mass grading for the Newport Banning Ranch Project.

In the event that cultural resources are exposed during construction, the monitor must be empowered to temporarily halt construction in the immediate vicinity of the discovery while it is evaluated for significance; construction activities could continue in other areas. If the discovery proves to be significant, additional work (such as data recovery excavation) may be warranted. A Registered Professional Archaeologist should, at minimum, supervise any monitoring activities.

Prior to the issuance of the firest grading permit and/or action that would permit Project site disturbance, the Contractor shall provide written evidence to the City of Newport Beach Planning Director that the Contractor has retained a qualified Archaeologist to observe grading/site disturbance activities and to salvage and catalogue archaeological resources, as necessary. The Archaeologist shall be present at the pre-grade conference; shall establish procedures for archaeological resource surveillance; and shall establish, in cooperation with the Contractor, procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the artifacts, as appropriate. If the archaeological resources are found to be significant, the Archaeologist shall determine appropriate actions in cooperation with the City and Contractor for exploration and/or salvage. These actions, as well as final mitigation and disposition of the resources, shall be subject to the approval of the Planning Director. Based on their interest and concern about the discovery of cultural resources and human

remains during Project grading, a Native American Monitor shall be retained to observe some or all grading activities.

1.5.5 Human Remains

In accordance with Section 7050.5 of the *California Health and Safety Code*, if human remains are found, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are or believed to be Native American, s/he shall notify the Native American Heritage Commission (NAHC) in Sacramento within 48 hours. In accordance with Section 5097.98 of the *California Public Resources Code*, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendents shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

With implementation of the mitigation program summarized above, potential impacts to archaeological resources would be reduced to a level considered less than significant.

Disposition of Data

This report would be filed with the City of Newport Beach, the Project Applicant, BonTerra Consulting, and at the South Central Coastal Information Center (SCCIC) at the California State University, Fullerton. All field notes and other documentation related to the study are on file at BonTerra Consulting.

SECTION 2.0 UNDERTAKING INFORMATION/INTRODUCTION

2.1 CONTRACTING DATA

The City of Newport Beach contracted BonTerra Consulting to conduct a cultural resources Phase II Evaluation of 11 sites on the Newport Banning Ranch Project site, and to complete a technical report that details the findings of the investigation and provides management recommendations.

2.2 REGULATORY SETTING

This section contains a discussion of the applicable laws, ordinances, regulations, and standards that govern cultural resources and that must be adhered to prior to and during construction of the proposed Newport Banning Ranch development Project. Federal and State regulations are included, as it is possible that both CEQA and NHPA regulations would apply. The report is intended to satisfy the requirements of (1) State CEQA regulations (14 *California Code of Regulations* [CCR] §15064.5 and PRC §21083.2); (2) Section 106 of the NHPA (36 *Code of Federal Regulations* [CFR] 800); and (3) a review by the U.S. Army Corps of Engineers (USACE) and State Historic Preservation Officer (SHPO) relative to a possible Clean Water Act (CWA) 404 Permit for the proposed Project.

2.2.1 Federal

Cultural resources are considered during federal undertakings chiefly under Section 106 of the NHPA of 1966 (as amended) through one of its implementing regulations (36 CFR 800,

Protection of Historic Properties) and under the National Environmental Policy Act (NEPA). Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of the NHPA. Other federal laws include the Archaeological Data Preservation Act of 1974, the American Indian Religious Freedom Act (AIRFA) of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1989, among others.

Section 106 of the NHPA (16 *United States Code* [USC] 470f) requires federal agencies to (1) take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP and (2) afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings (36 CFR 800.1). Under Section 106 of the NHPA, the significance of any adverse effect on cultural resource is assessed, and mitigation measures are proposed to reduce the impacts to an acceptable level. Significant cultural resources are those resources that are listed in or are eligible for listing in the NRHP per the criteria listed at 36 CFR 60.4 below.

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:
>
> (a) Are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) Are associated with the lives of persons significant in our past; or
>
> (c) Embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) Have yielded, or may be likely to yield, information important in prehistory or history.

2.2.2 State

CEQA requires a lead agency to determine whether a project may have a significant effect on one or more historical resources. A "historical resource" is defined as a resource listed in, or determined to be eligible for listing in, the CRHR (§21084.1); a resource included in a local register of historical resources (§15064.5[a][2]); or any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant (§15064.5[a][3]).

Section 5024.1 of the PRC Section 15064.5 of the CEQA Guidelines, and Sections 21083.2 and 21084.1 of the CEQA Statutes were used as the basic guidelines for the cultural resources study. PRC 5024.1 requires evaluation of historical resources to determine their eligibility for listing on the CRHR. The purposes of the CRHR are to maintain listings of the State's historical resources and to indicate which properties are to be protected from substantial adverse change. The criteria for listing resources on the California Register were expressly developed to be in accordance with previously established criteria developed for listing on the NRHP.

Section 15064.5(a)(3) of the CEQA Guidelines states that "[g]enerally, a resource shall be considered by the Lead Agency to be 'historically significant' if the resource meets the criteria

for listing on the California Register of Historical Resources" (PRC §5024.1; 14 CCR §4852), including if the resource:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B. Is associated with lives of persons important in our past;

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

D. Has yielded, or may be likely to yield, information important in prehistory or history.

The lead agency shall concurrently determine whether a project will cause damage to a unique archaeological resource (as defined in PRC §21083.2[b]) and, if so, must make reasonable efforts to permit the resources to be preserved in place or left undisturbed. Section 21083.2(g) of the California Public Resources Code defines a unique archaeological resource as an archaeological artifact, object or site about which it can be demonstrated that without merely adding to the existing body of archaeological knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

To the extent that unique archaeological resources are not preserved in place, mitigation measures shall be required (PRC §21083.2[c]).

Using the information outlined above, the first level of evaluation is to determine whether a resource on a site is a historical resource and/or a unique archaeological resource that would be considered eligible for the CRHR and, therefore, significant.

Impacts to significant cultural resources that affect those characteristics of the resource that qualify it for the CRHR or adversely alter the significance of a resource listed on or eligible for listing on the CRHR are considered a significant effect on the environment. Impacts to cultural resources are considered significant if a project (1) physically destroys or damages all or part of a resource; (2) changes the character of the use of the resource or physical feature within the setting of the resource that contributes to its significance; and/or (3) introduces visual, atmospheric, or audible elements that diminish the integrity of significant features of the resource.

The purpose of the current study is to evaluate the eligibility of 11 sites on Newport Banning Ranch for listing on the CRHR and the NRHP.

California Coastal Act

The California Coastal Act of 1976 (*California Public Resources Code* §§30000 et seq.) establishes policies guiding development and conservation along the California coast. Consistent with Section 30001 and the basic goals of Section 30001.5, and except as may be otherwise specifically noted in the Coastal Act, the policies of Section 30200 of the Coastal Act constitute the standards by which the adequacy of local coastal programs and, the permissibility of proposed developments subject to these provisions are determined.

2.2.3 City of Newport Beach

The City of Newport Beach has adopted archaeological guidelines that govern the identification and evaluation of cultural resources and are used to guide the development or redevelopment of lands within the City. The discussion below is adapted from the City Council Policy Manual Guidelines.

The archaeological guidelines, Policy # K-5, adopted on January 13, 1975, amended on January 24, 1994, and corrected on March 22, 1999, are summarized below:

A. The City shall, through its planning policies and permit conditions, insure the preservation of significant archaeological resources and require that the impact caused by any development be mitigated in accordance with the California Environmental Quality Act.

B. The City shall prepare and maintain sources of information regarding archaeological sites and the names and addresses of responsible organizations and qualified individuals who can analyze, classify, record, and preserve archaeological findings.

C. If determined to be necessary by the Planning Director, it shall be the responsibility of a landowner or developer prior to the commencement of land development to cause the proposed site to be examined to determine the existence and extent of archaeological resources. The examination shall be by qualified observers, approved by the City. The observers shall prepare and submit to the City a written report describing findings and making recommendations for further action. The report shall discuss both positive and negative aspects of the effects of the proposed development on archaeological resources. The report shall be considered as part of the CEQA review process and, if appropriate, the recommendations shall be included as mitigation measures and conditions of approval for the project.

D. Based on the report and recommendations of the observers, the City shall take such steps as are necessary to assure that any findings or sites are recorded, preserved and protected. These steps may include requiring the landowner or developers to incur reasonable expenditures of time or money, encouraging the involvement of appropriate volunteer or non-profit organizations or acquisition of the sites by public or private agencies. Provision shall be made for the deposit of scientifically valuable archaeological materials which are removed from the site with responsible public or private institutions. In all cases, the City shall seek responsible scientific advice and make the necessary decisions consistent with the public interest.

Procedures

The following procedures shall be used in examining and reporting on possible archaeological sites. If determined to be necessary by the Planning Director, there shall be a walk-over site survey and, if warranted, a pregrading conference prior to the commencement of any land alterations.

A. Procedures and Findings.

1. Records. Demonstration shall be made that a records check was completed and the results stated in the text of the final report.

2. Background. Background information shall be provided summarizing the significance of scientific, cultural and historical perspectives to the project area. Sources must be referenced.

3. On-Site Survey. The following descriptions shall be made in sufficient detail to allow verification of work:

   a. Methods of reconnaissance:

      i. surface
      ii. sub-surface

   b. A list of personnel and affiliation

   c. Date and location of research

   d. d. Condition of area surveyed which may have effect on archaeological findings

   e. Observations and data - description of archaeological resources found

   f. Location of material and data collected

   g. Notification of professionals in related disciplines where necessary, such as historians and paleontologists

4. Evaluation of impact (direct and indirect):

   a. Description of impacts

   b. Significance of impacts

B. Development Alternatives.

1. Methods to achieve site preservation.

   a. Revision of construction or development plans in the event of exceptional site, worthy of preservation and/or nomination to the National Registry (Historic Preservation Act of 1966).

   b. In the event that development ensues in areas adjoining the site that would involve potential impact by virtue of this proximity, steps should be taken to:

      i. protect the site by adequate means, such as fencing or other approved measures

      ii. stabilize where indicated

iii. restore damage occurring as a result of proximity of the source of impact

c. Restoration where applicable

2. Archaeological excavation.

   a. Full-scale, research-oriented excavation, properly planned and organized, adequately funded, and with sufficient time, is the preferred method of partial mitigation. The consultant's proposal to the City, included in the EIR, should contain, in detail, costs, procedures, time required and a statement of the importance of the work to be performed. This proposal may then be included in a conditional permit or be required prior to the issuance of a permit.

   b. Emergency salvage excavation is the least preferred method of partial mitigation. The result of poor planning, salvage techniques of excavation constitute an adverse impact or archaeological resources and represent the irreplaceable loss of a site.

3. Qualification of Consultants.

   Provisional to professional licensing, minimum qualifications for consulting archaeologists shall be satisfied by their listing in the Directory of Archaeological Consultants, available from the Society for California Archaeology, or the list of certified archaeologists maintained by the County of Orange. Verification regarding qualifications shall be made by the Planning Director.

2.3 UNDERTAKING

The proposed Newport Banning Ranch Project would allow for the development of the 401-acre site with residential, commercial, hotel, and recreational uses. The Project includes open space, parks, and infrastructure to support proposed land uses and future residents. Approximately 252 acres (approximately 63 percent) of the 401-acre site are proposed for natural resources protection in the form of open space and third-party habitat restoration. Of these 252 acres, approximately 20 acres would be used for interim oil operations until this area converts to open space use. Approximately 52 acres are proposed for active and passive park uses. The Project proposes up to 1,375 dwelling units (du). Of the 1,375 du, up to 730 du and up to 75,000 square feet (sf) of commercial uses would be constructed on approximately 21 acres of the site as a part of a mixed-used component of the Project. Up to 558 du would occur on approximately 65 acres of the site. Additionally, a 75-room resort and up to 87 du are proposed on approximately 11 acres. Roadways and infrastructure would be constructed. As an active oil field, remediation of the site is required.

2.4 PROJECT SITE

The Project Site Map shows a portion of the U.S. Geological Survey (USGS) 7.5-minute Newport Beach, CA quadrangle, which depicts the specific location of the Project site with an inset map showing the general vicinity of the study area. A majority of the site is located in unincorporated Orange County within the City of Newport Beach's Sphere of Influence. As a part of the Project, these unincorporated areas would be annexed to the City of Newport Beach.

2.5 PROJECT PERSONNEL

The cultural resources study was managed and directed by Mr. Maxon, who meets the Secretary of the Interior's Standards and Guidelines for Archaeology (NPS 1983) for prehistoric archaeology and is an Orange County-certified Archaeologist. Dr. Drover functioned as the Field Director and Principal Investigator for the study and was the principal author of this report. Tony Kuhner analyzed the material from the historic sites and provided analysis for the report. Mark Roeder analyzed the faunal material. The excavation crew consisted of Dr. Drover, Mark Roeder, Tony Kuhner, Dave Alexander, and Bill Dochnahl. A representative of the Juaneño Band of Mission Indians, Acjachemen Nation, Dennis Sommers, monitored all field work. Dr. Drover and Mr. Maxon completed this report with input from Mr. Kuhner. See Appendix B, Personnel Qualifications, for resumes.

SECTION 3.0 PHYSICAL SETTING

The Project site is located west of the current Newport Bay at the northwestern edge of the San Joaquin Hills, approximately one mile southeast of the mouth of the Santa Ana River. The Newport Banning Ranch Project site sits on the uplifted coastal bluffs surrounding the bay.

The Project site is located on the northern end of the Peninsular Range Geomorphic Province. These rocks are composed of pre-Cretaceous (more than 65-million–year-old) igneous and metamorphic rock with limited exposures of post-Cretaceous sedimentary deposits. However, these sedimentary deposits in coastal Orange County are considered to be some of the most important fossil-producing formations in the world (Strudwick & Goodwin 2008).

Surface deposits on the Project site consist of exposures of marine Quaternary terrace deposits with a mixture of terrestrial components. Underlying this, and exposed in the cliffs below the terraces, are the marine Late Miocene Capistrano and Monterey Formations. All have produced fossils in the Project vicinity (McLeod 2009).

The Project site has been heavily disturbed by oil and natural gas extraction operations since the 1940s, which continue today. The mesas that surround the Project site were, at one time, more extensive than they are today. Several mesas that previously extended nearly to West Coast Highway have been largely removed, leaving evidence of quarrying and remnants of the mesa (uplands) on the site**.** It is unknown if these removals were solely a result of oil operations.

3.1 CULTURAL SETTING

3.1.1 Prehistory

Archaeologists and ethnologists have long pondered over the cultural sequences that occurred before Spanish contact. The two most currently accepted schemes are those proposed by Wallace (1955), who interpreted the prehistory of coastal Southern California through temporal horizons, and Warren (1968), who viewed cultural differences not as temporal distinctions, but as local traditions. Wallace (1955) saw four temporal horizons along the Southern California coast: Early Man, Milling Stone, Intermediate, and Late Prehistoric.

Early Man Horizon

Spanning the period from the end of the Pleistocene to approximately 8,000 years before present (YBP),[1] archaeological assemblages attributed to this horizon are characterized by large projectile points and scrapers. The limited data available suggests that prehistoric

[1] "Years Before Present" assumes that 1950 is "present," so in this case 8,000 YBP would be 6,050 BCE.

populations focused on hunting and gathering and moved about the region in small nomadic groups.

Milling Stone Horizon

Characterized by the appearance of handstones and millingstones, this horizon tentatively dates to between 8,000 YBP and 3,000 YBP. Assemblages in the early Milling Stone Horizon reflect an emphasis on plant foods and foraging subsistence systems. For inland locales, it has been assumed that grass seed exploitation formed a primary subsistence activity. Artifact assemblages include choppers and scraper planes, but generally lack projectile points. The appearance of large projectile points in the latter portion of the Milling Stone Horizon suggests a more diverse economy. The distribution of Milling Stone sites reflects the theory that aboriginal groups may have followed a modified, centrally based wandering settlement pattern. In this semi-sedentary pattern, a base camp would have been occupied for a portion of the year, but a small population group seasonally occupied subsidiary camps in order to exploit resources not generally available near the base camp. Sedentism apparently increased in areas possessing an abundance of resources available for longer periods of time. More arid inland regions would have provided a seasonally dispersed resource base, restricting sedentary occupation.

Intermediate Horizon

Dated to between 3,000YBP and 1,350 YBP, the Intermediate Horizon represents a transitional period. Little is known about the people of this period, especially those of inland Southern California. Sites assemblages retain many attributes of the Milling Stone Horizon. Additionally, Intermediate Horizon sites contain large stemmed or notched projectile points and portable mortars and pestles. The mortars and pestles suggest that the aboriginal populations may have harvested, processed, and consumed acorns. Neither the settlement-subsistence system nor the cultural evolution of this period has been well understood due to a general lack of data. It has been proposed that sedentism increased with the exploitation of storable food resources (acorns); the duration and intensity of base camp occupation increased, especially toward the latter part of this horizon.

Late Prehistoric Horizon

Extending from the year 750 to Spanish contact in 1763, the Late Prehistoric Horizon reflects an increased sophistication and diversity in technology. This is characterized by the presence of small projectile points that simplified the use of the bow and arrow. In addition, assemblages include steatite bowls, asphaltum, grave goods, and elaborate shell ornaments. Use of bedrock milling stations was widespread during this horizon. Increased hunting efficiency and widespread exploitation on acorns provided reliable and storable food resources. These innovations apparently promoted greater sedentism.

By contrast, Warren's (1968) cultural traditions were more restricted spatially. Warren's scheme accounted for the cultural variability particularly evident within Wallace's late Prehistoric Horizon. Warren's traditions include the San Dieguito, Encinitas, Campbell, Chumash, Shoshonean, and Yuman.

The San Dieguito tradition occurs within Wallace's Early Man Horizon, but is restricted to San Diego County. The Encinitas equated to Wallace's Milling Stone, but was longer in time, encompassing Wallace's Intermediate Horizon. Warren saw no new tradition developing in northern San Diego and Orange Counties during this time period.

The Campbell and Chumash traditions are farther north in Santa Barbara and Ventura Counties. In Los Angeles, Orange, and North San Diego Counties, the Shoshonean Tradition began about

1300 YBP and represents the intrusion of Shoshonean speakers from the interior (Warren 1968). In contrast, the Yuman Tradition in southern San Diego County, just as the Chumash Tradition to the north, is thought to have developed from previous local traditions, whereas the Shoshonean Tradition is the result of intrusion into a previous tradition (Mason 1991:95).

Koerper (1981) and Koerper and Drover (1983) have taken the horizon system proposed by Wallace and have applied it more specifically to the prehistory of Orange County.

Koerper (1981) and Koerper and Drover (1983) adapted Wallace's four horizons using artifacts and associated radiocarbon dates from two Orange County sites: CA-ORA-64 and CA-ORA-119-A. The authors argued that the transition between the Milling Stone and Intermediate Horizons was marked by the appearance of the mortar and pestle. The primary projectile point type changed from the Milling Stone "Pinto Basin" to the stemmed and side-notched forms. The beginning of the Late Prehistoric Period occurred roughly with the appearance of the smaller "Cottonwood" points, suggesting the introduction of the bow and arrow, and also with the abundance of shell beads and ornaments, use of steatite for pipes, bowls, and ornaments and arrow shaft straighteners. Pottery may or may not appear at the end of the late Prehistoric Period or the Historic period (Koerper and Drover 1983).

Mason and Peterson (1994) have proposed subdividing Wallace's Milling Stone Horizon into three subdivisions, and the Intermediate, and the late Prehistoric into two. These temporal subdivisions are based entirely on radiocarbon age determinations that correspond to some degree with changes in settlement (Mason and Peterson 1994:58). In contrast, they note that temporal subdivisions traditionally have been defined on supposed differences in cultural content or traits as presented by Wiley and Phillips (1958:22). Mason and Peterson found little difference in the cultural content of their three Milling Stone subdivisions (Table 2).

TABLE 2
CULTURAL SEQUENCE FOR ORANGE COUNTY

Cultural Period	Radiocarbon Dates
Paleo-Coastal Period	
PC	Prior to 8000 YBP
Milling Stone Period	
MS1	8000 to 5800 YBP
MS2	5800 to 4650 YBP
MS3	4650 to 3000 YBP
Intermediate Period	
INT1	3000 to 2300 YBP
INT2	2300 to 1350 YBP
Late Prehistoric Period	
LP1	1350 to 650 YBP
LP2	650 to 200 YBP
Source: Mason and Peterson 1994 and Drover 2001a:17.	

During the Newport Coast Archaeological Project, the Intermediate Horizon was not subdivided because only ten radiocarbon dates were available. They were confident that the Intermediate Horizon could also be subdivided once calibrated dates were available from a wider region of the Newport Coast (Mason and Peterson 1994:58), and for that matter, all of Orange County or Southern California. The authors argue that although their temporary subdivisions do not correspond with changes in stylistically defined artifact types, they may correspond with changes in settlement systems (Mason and Peterson 1994:58). The Intermediate Horizon was

subdivided in Roger Mason's report on CA-ORA-225 (Mason 1997b). Mason defined 3 periods based on 18 radiocarbon dates. These three divisions are Late Intermediate (1700–1350 YBP), Middle Intermediate (2300–1700 YBP) and Early Intermediate (3100–2300 YBP). Due to the small sample of radiocarbon dates, Mason notes that the Intermediate subdivisions could only be applied to CA-ORA-225 and not regionally. As a result of the Bonita Mesa Archaeological Project (document in progress), the Intermediate Period was redefined. A total of 72 radiocarbon dates from 6 sites were used to redefine the Intermediate. The Intermediate was divided into two periods: the late part of the Intermediate or INT2 (1350–2300 YBP) and the early part of the Intermediate or INT1 (2300–3000 YBP).

3.1.2 Ethnohistory

At the time of European contact in 1769, the Santa Ana plain was occupied by the Gabrielino Native Americans, so called by the Spanish after the nearby Mission San Gabriel Archangel. According to Bean and Smith (1978:538), the Gabrielino are, in many ways, one of the least known groups of California native inhabitants. In addition to much of the Los Angeles Basin, they occupied the offshore islands of Santa Catalina, San Nicolas, and San Clemente. Gabrielino populations are difficult to reconstruct; however, at any one time, as many as 50 to 100 villages were simultaneously occupied. Like the prehistoric culture before them, the Gabrielino were a hunter/gatherer group who lived in small sedentary or semi-sedentary groups, termed Rancherias, of 50 to 100 persons. These Rancherias were occupied by at least some people all of the time. Location of the encampment was determined by water availability. Within each village, houses were circular in form and constructed of sticks covered with thatch or mats. Each village had a sweat lodge as well as a sacred enclosure (Bean and Smith 1978). Their subsistence relied heavily on plant foods, but was supplemented with a variety of meat, especially from marine resources. Food procurement consisted of hunting and fishing carried out by men, and gathering of plant foods and shellfish by women. Hunting technology included bow and arrow use for deer and smaller game, in addition to stick-throwing, snares, traps, and slings. Fishing was conducted with the use of shell fishhooks, bone harpoons, and nets. Seeds were gathered with beaters and baskets. Food was stored in baskets. It was prepared with manos and metates, and mortars and pestles. Food was cooked in baskets coated with asphaltum, in stone pots, on steatite frying pans, and by roasting in earthen ovens (Bean and Smith 1978).

Although the earliest description of the Gabrielino dates back to the Cabrillo expedition of 1542, the most important and extensive accounts were those written by Father Geronimo Boscana circa 1822 and Hugo Reid in 1852. Major Gabrielino villages south of the City of Long Beach apparently included Lukpa and Kengaa, also known as Gengara. Moyoonga is another place name cited by Kroeber (1907), but it is unclear if this was a community or a geographical designation (McCawley 1996:72). According to mission records, Kengaa may have been occupied as late as 1828 or 1829 (Merriam 1968). The place name was still used as late as 1853 identifying Newport Bay as "bolsa de gengara". Archaeological evidence suggests that CA-ORA-119A or CA-ORA-111 may be the remains of this important village. The other village, Lukpa, was, according to one of Kroeber's Native American informants, located in the City of Huntington Beach. One possibility is the Newland Site excavated by Winterbourne in the 1930s and more recently by other investigators.

During the early 1900s, important ethnographic studies were conducted by several researchers including Alfred L. Kroeber, John P Harrington, C. Hart Merriam, W. D. Strong, and J.W. Hudson. Each of these men was able to interview members of the Gabrielino who had living experience with the Mission period when the group was in transition. Central Orange County was shared by both the Juaneño (another Native American tribal group so named because of its association with Missin San Juan Capistrano) and Gabrielino. The three place

names associated with central Orange County are Genga, Pasbengna, and Hutuknga. Genga was located at CA-ORA-58 in what today is Fairview Park in the City of Costa Mesa. Pasbengna was located along the Santa Ana River approximately where the City of Santa Ana is today, and appears on the 1846 map drafted by Alexander Taylor. The third site, Hutuknga, is located where the City of Yorba Linda exists today (Earle and O'Neil 1994).

The Gabrielino are frequently thought to have been the dominant ethnohistoric group in Orange County (e.g., Kroeber 1925). Earle and O'Neil have determined that sites along the Santa Ana River afforded pivotal political exchange and social interaction between the Gabrielino and Juaneño (1994). Based on Mission marriage records, the villages along the Santa Ana River apparently consisted of multi-ethnic populations (Earle and O'Neil 1994). Among the more significant sites along the northern coast of Orange County was the complex of sites surrounding Bolsa Chica, including CA-ORA-83, known as the "Cog Stone" site or the "Griset Site". As with Bolsa Chica, Newport Bay also is surrounded by a number of prehistoric sites. The sites along the southern Orange County coast in the San Joaquin Hills include the multi-component complexes at Bonita Mesa, Pelican Hill, and Shady Canyon.

SECTION 4.0 RESEARCH DESIGN

The research design consists of three sections. The first, Theoretical Orientation, provides an overview of anthropological hunter/gatherer theory and focuses on what have been the most appropriate avenues of current theory motivating modern North American archaeology. The next section, History of Research, informs the reader of the general approaches scholars have taken in this region to define cultural prehistory. The final section here is entitled Hypotheses, Test Implications, Data Requirements. This section contains summary data for five archaeological research domains: chronology, settlement/subsistence, trade and exchange, lithic technology, and site structure. Within each of those domains, current local issues are discussed and pertinent research questions posed, followed by a brief discussion of the data necessary to address the questions.

4.1 THEORETICAL ORIENTATION

The study of archaeology is comprised of three basic paradigms: culture history, cultural reconstruction, and processual archaeology (Dunnell 1978). At a gross level, one can view the study of past cultures in terms of three basic components: time-space systematics (i.e., the situation of past cultures in time and space); reconstruction of past human behavioral patterns (lifeways); and the explanation of the culture process or culture change (see Bettinger 1982, 1989, 1991; Thomas 1979, 1983, 1989). *Time-space systematics*, especially chronology building, is a critical component of the study of more complex questions, especially ones of culture process. Unfortunately, much of Southern California archaeology suffers from an inadequate chronological framework. However, reconstructing chronology for an area is basically atheoretical, and stating that one is interested in prehistoric lifeways and culture change expresses only a very vague theoretical perspective.

The specific field of interest here involves two contact period populations in Southern California: the Gabrielino and Juaneño. The antecedents of both groups conform to the "boundary" region that has been identified for the hunter-gatherer populations that comprise the Late Prehistoric and Ethnohistoric time period(s), and is reflected in the cultural activities of these groups. It has been understood through analysis of the regional ecology and possible changes in both the patterns and trends associated with human adaptation over time based in the archaeological record. Key elements in characterizing settlement-subsistence systems that were operative during the different periods of human occupation can be modeled based upon the expectations and data matches in the archaeological record.

The history of Orange County archaeology has largely been concerned with the role of social organization. Evolution in the development of the past settlement systems, begun at the turn of the 20th Century with Kroeber (1907), has formed the core of such research. Yet the beginnings of cultural reconstruction in California archaeology started with Julian Steward (preceded by Kroeber), giving impetus to the field commonly known as either cultural ecology or ecological anthropology (i.e., Moran 1982). Steward (1938, 1955, and 1977) emphasized very basic relationships between technology and environment and other aspects of culture. The level of technology and the nature of the physical and biological environment helped determine the organization and scheduling of work in basic resource procurement and processing tasks. These factors, in turn, affected the general nature of overall social, political, and religious aspects of society. These factors formed what he termed the "culture core". Steward's approach is most useful for understanding and explaining relatively simple cultures with relatively limited cultural history.

Later cultural ecologists, such as Roy Rappaport, have approached societies from the perspective of systems theory standpoint, which views cultural subsystems as central and interactive (Rappaport 1968; Vayda and Rappaport 1976). Equilibrium between various cultural subsystems is viewed as the primary research goal, and was achieved through negative feedback between subsystems. The basic problem with the model is that it assumed that societies are basically adaptive, shifting the burden of culture change to external forces and minimizing the potential importance of competition, conflict, and technological innovation within a society.

Marvin Harris (1968, 1979) developed a more dynamic cultural ecological model. Drawing from Materialist concepts, Harris emphasizes the importance of societal infrastructure, which he describes in terms of modes of production and reproduction. *Production* deals with the relationships between technology, the environment, and the organization of work and *reproduction* focuses on demography and population control. This principle asserts that the infrastructure is the basic foundation of sociocultural life and that cultural selection favors societies' structure (politics, class structure, and other factors). Then the structure asserts a strong influence on the nature of the societies' superstructure (religion, philosophy, ideal, and other features). Harris' cultural materialistic approach states that domestic and political economies as well as the ideological superstructure associated with them are directly derived from a society's infrastructure.

Unfortunately, the archaeological record is a material one, and while inferences regarding social organization can certainly be made from this record, archaeology has been strongly influenced by Harris. It is the only approach that has been proven to be successful, as demonstrated by such important works by Steward (1938), Binford (1978), and Bettinger (1980).

This is not to say that ideological and historical factors are not important, but there is generally no way to test for their effects using the archaeological data from hunter-gatherer sites. These can be considered, however, when predictions or expectations based on the adaptive ecological model are not met. One could then entertain the possibility that the unexpected results are due to the influence of unknown ideological and/or historical factors. Maladaptive behavior appears to some extent in all cultures but may not explain general, long-term human behavior.

4.2 HISTORY OF RESEARCH

The study of Orange County prehistory was started well before the advent of radiocarbon dating, obsidian hydration, effective tree-ring studies, and most forms of absolute dating techniques. Nevertheless, a large number of major advances were made between the original participation on behalf of the Work Projects Administration (WPA) (Winterborne 1938) and the more formalized period of academic work initially associated with Wallace (1955). A set of well

defined cultural sequences pertaining to different cultural areas within Southern California were developed in the ensuing years, such as Malcolm Rogers' San Dieguito and Yuman chronologies (1939; 1945); those defined by D. L. True (1966) regarding the surrounding San Luis Rey River valley; the prehistoric La Jollan cultural phases (Moriarty 1966 1969); and subsequent ecological models defining demographic relationships existing between the coastal and inland desert regions of Southern California (i.e., Warren 1964). Although these proposed relationships continue to be improved in view of the more recent Carbon 14 (^{14}C) dates and regional studies that have since been conducted, most of the early models for human settlement shifts and migration to the coastal areas of San Diego and Orange Counties were developed during a time when radiometric chronology was limited.

Unlike more recent research efforts (i.e., Koerper, Mason, and Peterson 2000), the kinds of large-scale radiocarbon data sets that exceed between 500 and over 1,000 individual, calibrated ^{14}C dates (see Peterson 2000) did not exist when such cross-regional comparisons of human occupation were originally hypothesized. The application of more accurate and robust radiocarbon dating of sites, as part of an a priori database on which to formulate working hypotheses, is only one element that is new to archaeological endeavors following the late 1980s to the present. Current techniques, pollen cores, and advanced environmental reconstruction studies are now seemingly commonplace elements that go into the advancement of any given set of theoretical relationships and that were simply not available during the earlier investigations of Orange County history.

Due to radiocarbon upwelling calibration, a number of hypothetical relationships can now be tested based on the correlation between variables (such as sea level versus social diversity, or total range of Holocene-Pleistocene occupation as a function of cultural uniformity, compounded by geographic restrictions). Most recent archaeological developments in Orange County have to do with either solving for a set of causal agents that have included settlement and subsistence over time at a macro-scale, or the application of archaeological science techniques used to better illuminate the intricate structure of individual archaeological sites at the micro-scale (Grenda et al. 1998). Nearly all developments in Method and Theory have been influenced by the paradigmatic shifts from culture history to cultural reconstruction that originated along with the entire Ecological Paradigm (see Catalano 1986).

The apparent split in the application of cultural reconstruction is most evident when examining the work produced by C. W. Warren (1964; Warren et al. 1991) as a larger and more systemized view of understanding the archaeological record through reconstructing past cultural systems on the basis of prehistoric settlement-subsistence systems. There was a strong movement towards understanding the past environment (as cause, not determinism) on the basis of the paleo-climatological and biotic changes likely to have changed past human settlement (as illustrated by Drover 1979, Drover et al. 1979, and Drover et al. 1983); the focus also shifted towards the more integrated socio-ecological constructs that likely influenced culture, such as was modeled by H. Koerper (1981). Many of these ideas regarding settlement analysis, including optimal foraging theory, predictive modeling (i.e., Bettinger 1980), catchment, carrying capacity, and locational analyses indirectly stemmed from the original work of Julian Steward (1938, c.f. 1977). Additional work evolved from the theoretical roots associated with the eventual third paradigm, or Processual Archaeology (see Binford 1983), or with the notion of Formation Processes (see Schiffer 1972), both of which further impacted local-area research designs and work.

The complexity of the different influences of advanced methods and impacts from these various theoretical influences are reflected by most of the recent work that has taken place since the Newport Coast Archaeological Project (Mason and Peterson 1994). Each project incorporated more comparable and internally consistent means to quantify functional and stylistic artifacts

within discrete units of analysis that are subject to standards of temporal classification. Measurement scales were defined that fit logically within item-class variable definitions (an a priori definition of the variables and how each is to be operationalized), along with sampling criteria that fit within the hierarchy of the archaeological record. All of these analytic requirements are comprised of defining an intrasite structure based on the application of advancements in archaeological science in addition to the capacity to use the various spatio-temporal units to distinguish how a given set of data have been operative as site components within a larger settlement-subsistence system.

Only three comprehensive models of past settlement-subsistence system(s) are known to have been hypothesized for the Newport Bay/San Joaquin Hills region within the past 20 years. The work conducted by Warren (1964; 1968; Warren et al. 1991) and the notion of a settlement-subsistence focus was a fundamental precept regarding all past coastal and littoral regions of the Southern California and Orange County regions following the 1980s. However, few investigations to date followed the broader regional model proposed by Warren (1964). Starting with Hank Koerper (see Koerper 1981), the notion of cultural materialism and resource intensification became a primary focus within the Orange County region due to changes in the past environment. Through a blend of both approaches to the archaeological record expressed through culture history and cultural reconstruction, Koerper (1981) set out to explain how different resource zones would have been exploited as part of a seasonal round within the Newport Bay/San Joaquin Hills Region during prehistory in relationship to changes within the outer and emergent inner bay. The settlement model proposed by Koerper (1981) suggested that changes in substratum and salinity as the back bay and fresh water marsh developed over time was related to an increased use of the San Joaquin Hills (during the Intermediate Period) following a general pattern of intensification. The general habitation and settlement-subsistence model is one wherein changes in Newport Bay, combined with population pressure, forced local area inhabitants to seek resources located farther up into the San Joaquin Hills for the purpose of obtaining *Quercus agrifolia* (coast live oak), *Quercus chiysolepis* (canyon or maul oak), and/or *Quercus wislizenii* (interior live oak) resources. The latter is limited to a fall harvest only, although summer and fall exploitation were possible for the former two oak species. The *Quercus engelmanii* (Engelman oak) was also available during the summer and fall months. The model proposed by Koerper was based on a combination of protein dynamics and the general constructs associated with cultural materialism (i.e., Harris, 1968; 1979). Later work conducted by Mason and Peterson (1994) set out to define more closely how change was related to differences in specialization according to site type on the basis of functional variations in the proportion of artifact types using proportional differences in tool types. The later work was aided by the Lawrence Livermore National Laboratory (LLNL) study regarding how to apply a marine calibration correction curve to terrestrial versus marine organics to form a larger and more complex set of ^{14}C age determinations.

4.3 HYPOTHESES, TEST IMPLICATIONS, DATA REQUIREMENTS

The purpose of the Newport Banning Ranch test investigations is to determine whether any of the 11 archaeological sites present on the property are eligible for listing on the CRHR or the NRHP, and if they would thus warrant further consideration in the planning process. To achieve this goal, the data collected through survey, controlled excavation, and archival research is analyzed and used to evaluate the significance of each site. Pursuant to Section 15064.5(a)(3) of the CEQA Guidelines, a site is considered historically significant if it meets one of the four criteria for listing on the CRHR. Archaeological sites are typically evaluated under Criterion D, which assesses the potential of each site to yield information important in the State's prehistory.

Therefore, the primary goal of site testing at Newport Banning Ranch is to establish the dimensions, chronology, density, diversity, and integrity of the archaeological sites and to

compare them to other local and regional sites in order to determine whether any meet the statutory requirements of Criterion D.

Beyond basic chronological and other physical data regarding the sites, the testing makes no attempt to answer broad-ranging research questions, but merely demonstrates that each site does or does not possess sufficient diversity, density, and integrity of cultural deposits to warrant additional investigation. Therefore, this research design is focused on evaluating the Newport Banning Ranch sites' *potential* to address local and regional research questions. Within each of the five research domains presented in this section, general overviews of current archaeological progress within the region have been provided.

While the important research issues in coastal Orange County prehistory revolve around reconstruction of settlement-subsistence systems and change in these systems over time, the Project site is relatively unknown chronologically and culturally, and was focused on its own riverine-estuary unrelated to Newport Bay. Given the scarcity of knowledge of west Newport cultural resources, the Newport Banning Ranch Project site is in need of basic chronological sequencing and description. Especially important is the comparative shift to sedentism and territoriality that appear to be associated with increasing population density during the late Intermediate-Early Late Prehistoric Periods in areas surrounding Newport Bay. The related topics include chronology, the effects of environmental changes in Newport Bay, and trade and exchange. The following research themes, questions, and data needs are generated from the San Joaquin Hills Transportation Corridor (SJHTC) Treatment Plan approved by the California Department of Transportation (Caltrans) (Mason 1994) and the Bonita Mesa Archaeological Project (BMAP) (Drover et al. [in progress]). While these questions are not intended to be comprehensive, they do provide a structure for the general research orientation.

The following discussions provide general information regarding the research domains for the region and specific information related to the study area.

4.3.1 Chronology

Radiocarbon

Radiocarbon dates are necessary to determine the time periods and subperiods during which the sites were occupied in order to address the settlement-subsistence research questions discussed below. Where possible, charcoal or samples from single shells would be submitted for dating. Sampling would prefer features while "aggregate" samples would be avoided. As a result of a study performed in conjunction with the Newport Coast Archaeological Project, local correction factor (Delta-R) has been derived for the effects of upwelling on marine shell dates (Mason and Peterson 1994) and would be incorporated into the analyses.

Radiocarbon dating can also be used to address questions dealing with the age of particular artifact types and materials, especially projectile points, beads, and obsidian. Prior to a discussion of specific research questions and problems, it is important to summarize the temporally sensitive artifacts that have been found in Orange County prehistoric sites

Projectile Points

Projectile points have been considered as especially important time markers in Orange County. Koerper and Drover (1983), using desert types and types of their own creation, hypothesized a sequence of styles that emphasized when a particular kind of projectile might have flourished in Orange County. However, their data were from only one site, CA-ORA-119-A. More recently, Koerper, Schroth, and Mason (1994) have determined that most dart points, formerly thought to be chronological indicators with fairly narrow time ranges, co-occur during the Milling Stone

period. This study was based on 8 Newport Coast Archaeological Project Milling Stone Period sites with 79 radiocarbon dates.

The most common arrow points in coastal Orange County belong to the Cottonwood series. The majority of Cottonwood points in Orange County fall into what Eberhardt (see Marshall 1979:24) termed the Coast Cottonwood series (Koerper 1991: 1 83). Koerper and Drover (1983: 15–19, Figures 1, 5, 7-8, Appendices A–B) reviewed this point series for coastal Southern California. They suggest that "large" (greater than 3.5 grams) Cottonwood triangular and Cottonwood leaf-shaped points are generally more common at an earlier time (750 Common Era [CE] or 1200 YBP or even 500 CE or 1450 YBP) than are "small" (1.0- to 3.5-gram) points of the same types (Koerper and Drover 1983:11; Koerper et al. 1988). More recently, Koerper (1991: 184) has suggested that leaf-shaped Cottonwood points had their fluorescence prior to the Cottonwood triangular points (Finnerty et al. 1970:15). Koerper and Drover (1983) also suggested that "extremely small" (less than 1.0 gram) Cottonwood specimens were in vogue toward the termination of the Late Prehistoric Period. What Koerper and Drover (1983) call Sonoran projectiles shows affinities with Hohokam points of a later date, and thus they regard them as very late, Late Prehistoric Period time markers in Orange County, perhaps related to Lake Cahuilla desiccation and the subsequent population dispersion.

Although Koerper and Drover (1983) placed Elko-eared and Elko corner-notched points in the Intermediate Period, the Newport Coast Archaeological Project data showed that these point types also occur in the Milling Stone Period. The transition from dart points to arrow points is thought to have occurred by the end of the Intermediate Period. If single-component, late Intermediate sites are discovered, it should be possible to determine when the transition from darts to arrows occurred.

Obsidian Hydration Rates

Coso and Obsidian Butte are the principal sources of obsidian found in Orange County. Calibrated hydration curves have not yet been fully developed for the County. Koerper et al. (1986) proposed a logarithmic hydration curve for Coso obsidian found in Orange County. Further evaluation of the hydration rate depends on obtaining more hydration measurements from samples associated with radiocarbon dates. Although obsidian does not occur in great quantities at Orange County sites, past experience suggests that some specimens of Coso obsidian would be available to test the logarithmic curve. In addition, late sites may contain both Obsidian Butte and reused Coso specimens that could help elucidate the poorly understood lower micron range of any hydration curve. Locally, the Coso obsidian hydration rate suggested by Koerper et al. (1986) is a logarithmic function whose curve is described by the equation $y=a+(b)(\ln X)$, where *a* is -13.69 and *b* is 2.6. Alternatively, better fits of the data might be found in the works of Ericson (1977), Meighan (1978), Friedman and Obradovich (1981), or Drews and Elston (1983).

It is important to note that there is a proliferation of hydration rates, a fact highlighted in Koerper et al. (1986). For Coso material, Ericson et al. (1989) noted that at least 11 published rates exist (Koerper et al. 1986; Gilreath et al. 1987; Erlandson et al. 1987). Although researchers have attempted to control their data in terms of association and several variables, there has been a proliferation of rates, not an improvement in the accuracy of hydration rates, for Coso volcanic glass.

The problem is linked to attempts to create a universal hydration rate for Coso obsidian. What are needed are regionally specific rates that are tied to regional ambient temperature regimes. Obsidian hydration data from a given locale frequently indicate that areal-specific hydration rates do have a certain stability (cf. Wallace et al. 1989; Langenwalter et al. 1989). Obsidian Butte specimens are expected to be more abundant, and they might be used to build a

hydration rate for that material. Koerper et al. (1986:52) proposed a very tentative 110 years/micron rate for Obsidian Butte volcanic glass from CA-ORA-855 that should be tested with additional data.

Shell Beads and Ornaments

Shell beads recovered from Orange County sites are thought to follow King's (1990) shell bead chronology for the Santa Barbara Channel area, but this remains unverified. It is likely that shell beads used by the Gabrielino were made on Santa Cruz Island where Arnold (1987) found evidence for the manufacture of shell bead money; to date, no definitive evidence has been found of their manufacture locally. It is likely then that the Gabrielino obtained their shell beads from the Chumash. If so, then one would suppose that King's (1990) Chumash bead chronology would also be accurate for Orange County. However, trade relationships may not be constant over the years, and the Gabrielino may have preferred only certain types of shell beads. As a result, there may not be a direct correlation between bead temporal frequencies in Orange County and King's (1990) shell bead chronology. Evidence exists that early Milling Stone bead manufacture occurs at CA-ORA-64 (Macko 1998). The results of the Newport Coast Archaeological Project showed a good correlation between bead types indicative of various time periods in Santa Barbara County and radiocarbon dates (Gibson and King 1994). However, beads front time periods not represented by radiocarbon dates were often present in small quantities.

Chronology Questions and Data Requirements

Are there several means to determine the age and duration of occupation of the sites?

Can the various Cottonwood series projectile forms be used as temporal indicators in the Intermediate and Late Prehistoric Periods?

Are there dart point forms that can be used as temporal indicators for the intermediate Period or subperiods within the Intermediate Period?

Does obsidian exist in enough quantity and in a short time span of occupation to contribute to hydration rate research?

Are shell or stone beads present at the sites? Do the types fit the existing bead chronologies?

Are features available where scrutiny of shell detritus may indicate bead production activities?

Cottonwood series projectiles are frequently found in Late Prehistoric sites. If these projectiles are found during the Newport Banning Ranch Phase II investigation, then the question can be addressed for the Late Prehistoric Horizon.

Large samples of dart points from single-component sites in association with radiocarbon dates—preferably from charcoal or single shell dates—are also required. Should dart points be discovered during the Phase II test at the site, the question can then be addressed.

This Phase II test evaluation would determine whether obsidian is present at the sites. Although the testing may not yield sufficient quantities of obsidian for all tests, it would demonstrate the presence of the material at the site. The Phase II would likely result in insufficient quantities of obsidian for hydration and source analyses that, when correlated to radiocarbon dates, would

provide adequate data for advanced studies regarding temporal placement and source of obsidian trade through time.

4.3.2 Settlement/Subsistence Systems

Ethnohistoric and archaeological evidence suggests the intense occupation of the San Joaquin Hills began no later than the Milling Stone Period and extended into the Late Prehistoric Period through to initial contact with Europeans. Among the primary explanations for this long-lived concentration of settlement was the diverse and abundant supply of natural resources available in the local environment. Archaeologically, differential site preservation may also be an important factor.

By comparing archaeological, ethnohistoric, topographical, and biological data from the Newport Coast, it is possible to reconstruct the biotic habitats that once existed on and near the San Joaquin Hills. This would have included not only the terrestrial habitats of the mesa and San Joaquin Hills, but also the rich and diverse marine habitats of Newport Bay and the outer coast. Fluctuations of the resource base and physiographic changes during the middle to upper Holocene may have directly contributed to some past interpretations (e.g., Mason) of Intermediate Period "abandonment" (Mason et al. 1992:332).

The Late Prehistoric Period sites investigated as part of the Newport Coast Archaeological Project were all approximately the same distance from Newport Bay (5 to 7 kilometers [km]), and there were no Intermediate Period sites present. The Bonita Mesa Archaeological Project provided the opportunity to investigate 7 sites, several of which are placed in the Intermediate Period along Bonita Creek within 15 km of Newport Bay. The Newport Banning Ranch archaeological sites allow for a different perspective on resource procurement and settlement as the sites are farther from the upper Newport Bay, the freshwater marsh at the University of California, Irvine, the interior San Joaquin Hills, and the rocky open coast of Corona del Mar and Crystal Cove.

Intermediate Period

As a result of the Newport Coast Archaeological Project, progress has been made toward understanding the Late Prehistoric Period settlement system in the San Joaquin Hills and its relationship to the wider system that includes the village of Gengara. However, very little is known about the Intermediate Period when (as previously discussed) major settlement shifts from a more mobile seasonal round system to a more sedentary territorial system is believed to have occurred. Various scenarios have been suggested as to whether the Intermediate Period represents abandonment, retooling or intensification, or whether it is simply part of an existing period. Sites that appear to be residential bases were located near water sources within three km of Newport Bay by the end of the Horizon. Until the recent work related to the Bonita Mesa Archaeological Project project (Drover et al. [in progress]), very little was known about this transition because material from few sites in the Newport Bay area had an Intermediate Period component. Only CA-ORA-119-A and CA-ORA-116 had been comprehensively analyzed and reported (Koerper 1981; Grenda et al. 1998). The analysis and interpretation of the Intermediate Period component of CA-ORA-119-A suggest that it was a multi-season (possibly year-round) major residential base (Koerper 1981). However, 11 of the 13 radiocarbon dates are from after 2000YBP, indicating that the transition to increased sedentism may not have occurred until the later part of the Intermediate Period. Interpretation of the CA-ORA-119-A Intermediate Period component is complicated by the fact that the site also has Milling Stone and Late Prehistoric Period components. These are somewhat segregated vertically and horizontally, but it is not certain that any individual artifact can be assigned to the Intermediate Period component.

Due to recent research, the Intermediate Period sites in the San Joaquin Hills now include two subperiods: Intermediate I and Intermediate II (Drover 2001:45). It might be assumed that a shift from single-season residential bases prior to 2000 YBP to multiple season or year-round major residential bases after 2000 YBP took place. Specialized activity loci may also appear after 2000 YBP In order to test this model, all Intermediate Period sites discovered need to undergo the same kind of analysis as the Newport Coast Archaeological Project and Bonita Mesa Archaeological Project sites. Site type should be determined, seasonality indicators should be obtained, internal site structure should be investigated, and it should be determined whether evidence for subsistence intensification is present. In addition, chronological data are required to determine when multiple-season residential bases first appear. However, new data resulting from research efforts associated with CA-ORA-116 (Grenda et al. 1998) and the Bonita Mesa Archaeological Project (Drover et al. [in progress]) allow for clearer insights into Intermediate Period settlement patterns. While yet to be published, the findings of the Bonita Mesa Archaeological Project may be further tested depending on the chronological age of the subject sites.

Environmental Changes in Newport Bay

There may be a link between the relative lack of habitation sites during the early Intermediate Period and environmental change in the Newport Bay region. Radiocarbon data in Schroth (1983:79) show a near absence of radiocarbon dates for the period between 3000 to 2500 YBP More recent data in *California Radiocarbon Dates* (Breschini et al. 1990:98-99) show 10 radiocarbon dates for this period. Most of those dates are from CA-ORA-378 (Christ College Site in the City of Irvine) located southeast of the upper end of Newport Bay. As discussed previously, a settlement shift may have occurred during the Intermediate Period. However, the small number of sites during the early part of the Intermediate Period may also be related to an environmental change in the San Joaquin Marsh at the head of Newport Bay. In addition, results of the BMAP research further indicate distinct cultural/biological changes at the onset of the Intermediate Period (Drover et al. 2001).

Information on changes in the marsh comes from the study of a 687-centimeter (cm) pollen core extracted from an undisturbed area of the marsh (Davis 1992). The pollen core was dated with five radiocarbon dates. The findings are summarized as follows:

> From circa 7000 to 4500 YBP, the site was a freshwater marsh, trees were more abundant than today, and grassland was the regional vegetation. As the sea level rose, salt marsh gradually invaded the site. Brief periods of freshwater marsh (3800, 2800, 2300, and after 560 YBP) correlate with episodes of global cooling during the Neoglacial (Davis 1992:89).
>
> The post-560 YBP period correlates with the Little Ice Age and with reduced sea-surface temperatures in the Santa Barbara basin (Pisias 1978). The freshwater events (2800 and 2300 YBP) match two Recess Peak advances (Scuderi 1984), and these events appear to be very rapid, large-scale climatic fluctuations. Many sites in Western North America appear to record cold-wet climate at this time (Davis 1992:97).

Davis also shows that while these freshwater intervals peaked for relatively brief periods, the duration of the freshwater phases was relatively prolonged during the overall saltwater phase (i.e., from circa 4000 to 3500 YBP, 3000 to 2,500 YBP, and 2400 to 2300 YBP). After 2300 YBP, there are no further freshwater phases prior to the Little Ice Age (post-560 YBP). In short, during most of the Early Intermediate Period (circa 3000 to 2300 YBP), the San Joaquin Marsh was dominated by fresh water, whereas during the Late Intermediate and most of the Late Prehistoric Periods, the marsh was dominated by salt water. If one assumes that Upper

Newport Bay, which once extended northward to include the San Joaquin Marsh, was not suitable for brackish (salt water) shellfish during these freshwater periods, its attractiveness as a place for settlement would have greatly diminished. This might explain the relative lack of settlement during the early and middle part of the Intermediate Period. Conversely, the return of saltwater marsh conditions would clearly indicate brackish conditions in Upper Newport Bay suitable for brackish water shellfish. There is a concomitant increase in settlement during the Late Intermediate and Late Prehistoric Periods.

Questions and Data Requirements

What site types are represented by the sites?

Are these sites similar in type and function to other sites in this part of the San Joaquin Hills?

Were the local marine resources exploited similarly to sites closer to the coast?

Did these sites rely more on terrestrial faunal and floral resources than marine resources?

With refined radiocarbon studies from the data recovery at this site, can contemporaneous occupation be demonstrated between these and other sites in the area?

During which season(s) was the site occupied? Is there a correlation between this and other sites in the region with respect to seasonality?

Can these sites address the question of intensified occupation during the Late Prehistoric?

What were the local subsistence procurement strategies by habitat?

Is there a correlation between changes from predominantly freshwater to saltwater conditions in the San Joaquin Marsh during the site(s) occupation?

The Newport Coast Archaeological Project and Bonita Mesa Archaeological Project results show that site type is best determined by multivariate analysis of the proportions of functional artifact types. Therefore, the tools must be classified functionally along with other artifacts, such as beads and ornaments, to address this question. Also, variations in the proportion of artifacts at different depths in different horizontal locations at a site may, when dated chronologically, indicate that the site type has changed with time. An analysis of the subsistence remains and tool types may indicate specific environmental factors responsible for the changes in the functional use of the site.

A comparison of specific classes of data between sites must be conducted. Data classes that may be compared include chipped stone, shellfish, animal bone, and functional artifact types. Additionally, methods for establishing site type have not been standardized in this region; therefore, analyses specific to this question may not have been conducted uniformly at other sites.

Additional radiocarbon analyses at the archaeological sites would refine the chronology of the site. Comparisons of established site chronologies could be made to establish whether rock shelters in the region were occupied contemporaneously. Time-sensitive artifacts such as

projectiles and beads, both of which were found during the test, may also facilitate temporal comparisons between sites.

Seasonality indicators available in this area include identified charred seeds, faunal remains, and fish otoliths (inner-ear bones). Most of the plants whose seeds have been found in area sites produce seeds in known seasons. Recovery of these seeds can therefore be used to obtain seasonality determinations. It should be noted that there are few, if any, plants in the area that produce seeds in the winter and early spring. Charred seeds are recovered from flotation of soil collected from around fire-affected rock features and column samples.

Analysis of faunal remains may indicate what species of animal were procured, and, in the instance of some migratory birds or certain juvenile specimens, the season of procurement.

By sectioning the otolith (which have annual growth rings), it is possible to determine the degree of development of the last growth ring, and thereby the season during which the fish died. Use of otoliths to determine seasonality has limitations. Most otoliths recovered from previous investigations are those of near-shore ocean fish. However, the most numerous fish used for food by the prehistoric inhabitants of the area come from the ocean kelp bed zone and from Newport Bay. Kelp bed fish are not represented because they have small, fragile otoliths. Cartilaginous fishes from the Newport Bay, such as bat rays and shovelnose guitarfish, are not represented because they do not have ear bones. Therefore, most otoliths recovered from archaeological sites only provide information on the seasonality of near-shore ocean fishing.

Visual analysis of shellfish growth bands to determine seasonality has been determined not to be a reliable method in this area (Cerreto 1992; Koerper, Cerreto, and Reitz 1984). Oxygen isotope analysis of shellfish growth rings appears to be a valid seasonality technique (Killingley 1981), but is not cost effective because of the large number of samples required from each individual shell to produce a reliable result. Ample numbers of bird and terrestrial fauna and otoliths could be required for the site(s) to be able to address this question.

Additional studies of the diversity and abundance of subsistence remains may yield data specific to the question of intensification during this period. Additional radiocarbon analyses may indicate the presence of earlier occupational periods as well.

Floral, faunal, and shellfish remains and lithic debitage may each contribute to the identification specific exploited habitats. Different species populate the various habitats local to the site, and a quantitative analysis of the remains may indicate procurement strategies by habitat. Lithic manufacturing debris, groundstone implements, and chipped stone implements may suggest modes of procurement and preparation specific to one or more habitats. The data recovery would provide adequate data regarding artifactual and ecofactual materials to suggest procurement strategies.

4.3.3 Trade and Exchange

Archaeological information about trade and exchange comes mostly from exotic lithic materials. These are materials with no known local source that must have been obtained from elsewhere through trade or exchange. One of the most studied exotic materials is obsidian.

Sources of Obsidian

It is only recently that regional patterns of obsidian exchange have received systematic study in Orange County. Koerper et al. (1986) offered the hypothesis that most obsidian in Orange County came from the Coso source in Inyo County until the beginning of the Late Prehistoric Period. A hiatus in the availability of obsidian from any source was followed by an influx of

obsidian from the Obsidian Butte source on the southeastern shore of the Salton Sea in Imperial County. It is suggested that the water level in Lake Cahuilla (now the Salton Sea) receded at this time, exposing the Obsidian Butte source that previously had been submerged and inaccessible. Thus, the end of the Late Prehistoric Period was dominated by material from the Obsidian Butte source. Ericson et al. (1989) suggested that if the hypothesis is correct, hydration measurements of obsidian from Obsidian Butte should be less than 2.5 microns and hydration measurements of Coso obsidian should be greater than 4.5 microns.

Sourcing and hydration measurements of Newport Coast Archaeological Project obsidian samples showed that the situation is more complex. Obsidian Butte specimens with hydration measurements between 6.0 and 7.8 microns were found in Milling Stone Period sites. It was also found that obsidian from Coso and Obsidian Butte co-occurred during the Late Prehistoric Period with no hiatus separating the availability of obsidian from the two sources. Late Prehistoric Obsidian Butte hydration readings ranged from 1.0 to 4.2 microns, while Coso obsidian hydration measurements ranged from 1.0 to 9.7 microns. Additional samples are necessary to verify these trends in obsidian exchange.

Obsidian Exchange

The amount of obsidian at Orange County sites is generally small, even at village sites. It is not clear how this obsidian got into Orange County. Was it through formal exchange mechanisms such as the use of trade partners? Was it the result of occasional forays into other territories by Gabrielino and/or Juaneño/Luiseño individuals? Was it the result of curating or husbanding tools that were transported by incoming peoples? Was it a form of “down-the-line exchange” (Ericson 1981)? Whatever the mechanism, knowledge of the form in which obsidian arrived in Orange County may provide some clues.

Study of obsidian specimens recovered from Newport Coast Archaeological Project sites (Mason and Peterson 1994:296) showed that obsidian comprised only 0.2 percent of the analyzed debitage from Milling Stone Period sites and 0.4 percent of the analyzed debitage from Late Prehistoric Period sites. Tertiary (cortex [original surface] flaked away) flakes comprised up to 90 percent of the Milling Stone Period obsidian specimens, and there were very few decortication flakes and no cores. The absence of cores suggests that all obsidian pieces of sufficient size were used for tools; none were wasted. During the Late Prehistoric Period, the proportion of bifaces and biface thinning flakes increased compared to the Milling Stone Period. There is a slightly higher proportion of decortication flakes, and one core is present that indicates obsidian in larger, less reduced pieces was somewhat easier to obtain. The greater number of obsidian flake tools also indicates this.

Questions and Data Requirements

What types (sources) of obsidian were traded into the Project area and when?

Does the obsidian at these sites enhance our current understanding of hydration?

In what form did obsidian arrive in Orange County?

Do the obsidian specimens provide any evidence for secondary use?

The test must demonstrate that obsidian is present at the archeological sites before a complete analysis can be anticipated following a data recovery phase. If sufficient quantities are recovered during data recovery excavations, sourcing, hydration, and transported forms can be addressed. An analysis of the kinds of obsidian debitage and cores or core fragments recovered from sites may indicate the initial form in which obsidian arrived at the San Joaquin Hills sites.

Samples of obsidian large enough to provide good surfaces for hydration measurements may provide data regarding obsidian as a temporal indicator. Radiocarbon dates would also be required to date the deposits from which the obsidian was recovered. It should be noted that the gradual acquisition of data from a number of sites may be necessary to address hydration calibration and reduction/transport strategy. Because the amount of obsidian from any one site would be small, the results from one site would not answer the research question but would contribute to the regional database.

4.3.4 Lithic Technology

Lithic analyses provide data regarding site function and settlement-subsistence patterns primarily through the temporal identification of technology and technological changes, and trade and exchange of materials used in prehistoric lithic technology. The classes of lithics that may be recovered include chipped stone artifacts, battered tools, milling implements, and ground tools. The appearance of these classes of lithics at any given site is temporally defined from comparisons with lithic assemblages from known contexts that have been validated through radiocarbon dating. The classes of tools we would expect to find would correlate strongly with the Newport Coast Archaeological Project conclusions regarding classes of functional tool types versus site type. Major residential sites in the vicinity, such as CA-ORA-64, CA-ORA-106, CA-ORA-119a, CA-ORA-220, and CA-ORA-223, would yield a wider range of all classes of tools since more activities occurred there. Smaller extractive or seasonal sites would yield proportionally fewer classes since the activities conducted there required fewer tools.

An analysis of lithic debitage, by kind and material, if sufficiently large enough, could provide information on reduction strategies and the degree of preparation of materials prior to transport from the source to the site. Preferences for material types and reduction techniques or other manufacturing techniques may be defined from a larger data recovery sample.

Milling implements, where present, suggest subsistence procurement strategies and may be useful for defining site type.

Questions and Data Requirements

> *What classes of lithics are at the sites and can the site types be demonstrated from them?*
>
> *Are there exotic lithic materials present at the sites, and, if so, can the sources be identified?*
>
> *Can subsistence practices, such as seed milling, be demonstrated from milling implements found at the sites?*
>
> *Are there any temporally sensitive projectile points at the site? If so, can that be supported through radiocarbon or obsidian hydration analyses.*

The test and evaluation sample should be sufficiently large to provide adequate data regarding each class of lithics present at the sites. Data should indicate the presence or absence of materials and provide a representative sample of the kinds and types of lithics used through time. Some rare items such as obsidian, projectile points, or shaped objects may not be recovered from the test.

4.3.5 Site Structure

The horizontal placement of various classes of cultural materials within a site may indicate the kinds of activities that were conducted there. Discreet loci of food preparation, lithic reduction, refuse, house pits, or other kinds of activities may be represented at the sites. These features may vary in complexity, kind, and depth as well, suggesting potential variations in site type through time. However, the degree of bioturbation, both from recent plowing and from the presence of rodents at the site, needs to be considered when feature-like materials are encountered. Hearth clean-outs or other secondary depositional events such as refuse piles, sub-midden caches, and human reburials can complicate the archaeological record and hamper a final interpretation of the event. Every feature investigated is considered a discreet unit of analysis or synchronic event, and analyzed accordingly.

Questions and Data Requirements

Are features present at the sites?

If features are not found during the test, are there materials present at the sites that are typically associated with features?

Is the site stratified temporally and are there variations in materials through time suggesting different activities occurred there or that the site type has changed through time?

If features are not found during the test, their presence may be suggested through careful scrutiny of the cultural materials contained in the sample. Sufficient quantities of burned and unburned bone, shellfish, beads, burned rocks, and lithic implements may indicate the presence of an intact or disturbed feature at the site. If features are encountered, the possibility of an extant living floor or house pit should be considered when implementing the feature excavation procedures.

SECTION 5.0 METHODS

The results of the field and laboratory investigations of the Newport Banning Ranch archaeological sites are summarized in this section. Each site is treated separately with the same categories of information, where applicable. The heading *Field Methods and Procedures* and *Data Sampling and Excavation Procedures* contains (1) a detailed description of each site's excavation layout; (2) unit and posthole excavation procedures; (3) field preparations of excavated sediments; and (4) maps and photographs of the site. The section entitled *Laboratory Methods and Procedures* describes how the matrices were treated in the Laboratory. The *Results* section begins with a table indicating the artifact classes, kinds, and types recovered from the soil matrix of each site. The section *Unit Profiles* has a brief description of the sediment stratigraphy. The last section, *Site Integrity*, is a description of the general integrity of the site. This section also contains site photographs.

5.1 FIELD METHODS AND PROCEDURES

This section reports on the field preparations and data recovery methodology that were implemented during the fieldwork at sites CA-ORA-839, CA-ORA-843, CA-ORA-844, CA-ORA-845, CA-ORA-906, CA-ORA-1599, CA-ORA-1600, CA-ORA-1601, CA-ORA-1602 and CA-ORA-1610; CA-ORA-148 was not subjected to excavation. The preliminary fieldwork consisted of site relocation; site boundary delineation; brush clearing; construction of a data sampling grid

at each site; the excavation of postholes and/or one meter-square units; matrix screening and washing; surface collections; unit profiles; and site photographs.

5.1.1 Site Boundaries

The site boundaries for several sites were very difficult to delineate based on the observable surface distribution of cultural materials and topographic limitations. The most salient materials at the sites were shellfish remains. While site boundaries were identified primarily from the surface distribution of shellfish remains, all other possible cultural materials such as bone, debitage, and fire-affected rocks were also considered when the boundaries were identified. Pin flags were used to demark the furthest extent of the surface artifacts and initial unit locations (shovel test pits or control units).

5.1.2 Data Sampling and Excavation Procedures

Shovel Test Pits (STPs)

STPs were excavated with a circumference of 40 cm in 20 cm increments, then the matrix from each level was dry screened through ¼-inch mesh for specific classes of material, including stone tools, debitage, groundstone tools, miscellaneous lithics (e.g., ochre, asphaltum), non-fish and fish bone, bone tools, charcoal, fire-affected rock, or historic material. Shell hinges and apices were collected, counted, weighed, and speciated. Aside from the historic sites, historic materials in STPs provide evidence of recent disruptive activities that occurred at the sites, such as pot hunting, and contribute to the general understanding of bioturbation processes at the sites. Based on the results of the STPs, sub-surface control units would be implemented to recover comparative, quantified data.

Control Units

Archaeological sites where surface manifestation may have appeared to be sparse but where STPs showed significant subsurface data warranted the excavation of control units for purposes of eligibility determination (cf. CA-ORA-844 Locus B). Easily definable archaeological sites such CA-ORA-839 were subject only to control test units to determine eligibility. Control units 1 x 1 meter in size were primarily utilized to generate cubic density data for comparison with the Newport Coast Archaeological Project site type criteria (Mason and Peterson 1994). Control Units were excavated in 10-cm increments and each level was wet screened and sorted through 1/8-inch mesh for specific classes of materials, including flaked stone tools; debitage; groundstone tools; miscellaneous lithics (e.g., ochre, asphaltum); bone tools; otoliths; shell; shell beads and ornaments; charcoal; fire-affected rock; historic material; and non-fish and fish bone.

The shellfish sample from each 1 x 1 meter unit was sorted from the matrix and identified by the lab technicians. Shellfish identification consisted of determining the genus (and species, where possible) of all non-repetitive shell elements (hinges and apices). Non-repetitive elements were then counted. If non-repetitive elements for a particular taxon were not found, the sample was referred to as “sp.”, but not given a count. The shellfish from the postholes were speciated, and the count of fragments was taken.

All stone tools; groundstone tools; miscellaneous lithics (e.g., ochre, asphaltum); bone tools; otoliths; and beads/ornaments were separated from the matrix and weighed, bagged, and labeled individually. The weight and count of fire-affected rocks was collectively recorded for each unit level by material type and discarded. Charcoal was collectively weighed, bagged, and labeled for each unit level.

Some archaeological sites received only STPs. Archaeological investigations had been unable to relocate several archaeological sites on the property subsequent to Van Horn's work in 1974. Such sites (e.g., CA-ORA-843, and CA-ORA-906) had been subsequently recommended for STPs to determine whether the site still existed and, if warranted, control pits to evaluate the deposit (Drover and Smith 1999 and LSA 2008). Because of the extended effort and access to Van Horn's original research document of (cf. 1982), the present effort was able to relocate all original site locations. While original site locations could be verified due to photographs and accurate descriptions, several sites, such as those noted above, had been heavily impacted, often scraped by earth-moving equipment into nonexistence. In such sites, STPs alone were sufficient to determine insignificance.

Archaeological sites where surface manifestation may have appeared to be sparse but where STPs showed significant subsurface data warranted the excavation of control units for purposes of eligibility determination (cf. CA-ORA-844 Locus B). Easily definable archaeological sites such CA-ORA-839 were subject only to control test units to determine eligibility.

5.1.3 Screening, Washing and Laboratory Methods and Procedures

After the matrix recovered from each level of each posthole and unit was water-screened through $^{1}/_{8}$-inch mesh in the field, the washed matrix remaining in the screen was dried, bagged, labeled, and brought to the laboratory for sorting and identification. In the lab, each unit level was screened through ¼-inch mesh screen, effectively separating the larger matrix fraction that was greater than ¼ inch in size from the smaller matrix fraction that was less than ¼ inch in size. The ¼-inch mesh was used only to separate the larger items from the smaller items to facilitate the sorting process. Laboratory sorters then sorted all cultural materials from the screened matrices by separating items by class. The remaining non-cultural material was discarded.

5.1.4 Cataloging

All artifacts (chipped-stone tools, groundstone tools, shell artifacts, bone tools, obsidian, otoliths, beads, and ornaments) were identified in the laboratory and assigned individual catalog numbers. The remaining cultural materials were separated into classes consisting of fish bone, non-fish bone, speciated shell elements (shell was not speciated for the postholes), fire-affected rock by material type, lithic debitage by material type, and charcoal.

Catalog entries for tools included provenience, identification of artifact type, material, weight, and count. Catalog entries for fish bone, non-fish bone, and speciated non-repetitive shell elements include provenience, weight, and number of specimens by unit level. Entries for debitage included material type and type of break. All bags of catalogued material contain this coded information on paper labels.

All fish bone and non-fish bone were identified and cataloged by Mark Roeder (using the catalog numbers from the initial database). All bone was identified by species, bone element, and symmetry. The catalog sheets were then entered into an Excel database. Mr. Roeder analyzed the data for all vertebrate remains and produced a report (see Appendix B). Mr. Kuhner investigated and evaluated the historic materials described in archaeological sites CA-ORA-1601 and CA-ORA-1610.

All cataloging was recorded on 11- by 27-inch cataloging sheets using codes from the TKCI cataloging codebook. Coding was derived from the University of California, Santa Barbara coding system. The cataloguing sheet had 26 column categories and 42 rows for individual catalog entries. The column categories included catalog number; lot number; unit number; northing; easting; feature number; feature item number; unit type; sample type; level start and

end; screen type; quantity; weight; material; class; objects 1 and 2; modifications 1 through 4; element; cortex; symmetry; and comments. The data from the catalog sheets were entered into a Microsoft Excel 7.0 database for sorting capability.

SECTION 6.0 RESULTS

Project cultural resources and testing activities and results would be described in this section. The oil lease activities on Newport Banning Ranch have in some ways protected some resources from potential impacts that may have occurred through the years. However, earth-moving activities associated with oil lease production have greatly disturbed all of the recorded cultural resources on the Project site. Disturbances that have affected cultural resources include road building, quarrying and preparation, closure, and rehabilitation of drilling pads. Fill, acquired from numerous locations on the property through time, was often utilized to create roads and pad sites in the lower wetlands. In some cases, these disturbances have resulted in isolated cultural loci within sites as consequences of grading rather than cultural activities (see CA-ORA-839, Figure 5). The fact that disturbances have occurred to most sites does not diminish their scientific value in light of the general lack of knowledge regarding the prehistoric occupation of the Santa Ana River mouth estuary.

6.1 PREHISTORIC SITES

6.1.1 CA-ORA-148

The site was first recorded in the SCCIC in 1964 by McKinney; however, according to Van Horn, the site was claimed to have been first noted or recorded by Strand in 1935 (Van Horn 1982:25). Hall revisited the site in 1979 and, aside from noting fossil shell on the surface mixed with an occasional historic shell, did not find any evidence of a midden or subsurface deposit (1975:1). Van Horn tested the site in 1982 and excavated 19 postholes between 15 and 100 cm deep, which were analyzed for artifacts, pH tested, and examined for soil color (Figure 1). While pH testing suggested a one-time midden deposit, the general results warranted neither avoidance nor further mitigation (LSA 2008:55). Drover and Smith (1999) found no evidence of shellfish or midden and believed the site had been severely impacted both by oil pads and later by closure of the pads and cleaning of the area. Drover and Smith further contended the surface topsoil consisted of exposed bedrock formations and recommended no further work at the site. (See Appendix C, Exhibit: Overview.)

The site was visited during the current study, and conditions are the same as reported by LSA (2008) and Drover and Smith (1999). No work was undertaken. The site area is depicted on Figure 2.

It is difficult to determine what depth any original cultural deposit may have had. Most of the “soil” on the site actually consists of Qtm or Quaternary Marine Terrace, with grading having disturbed the past top soil or potential cultural deposits (cf. GMU 2080).

The poor physical integrity of this site and resulting lack of cultural data available renders it impossible to provide any of the data requirements to address questions presented in the Research Design section above.

FIGURE 1
ORA-148; VAN HORN'S TEST UNIT LOCATIONS

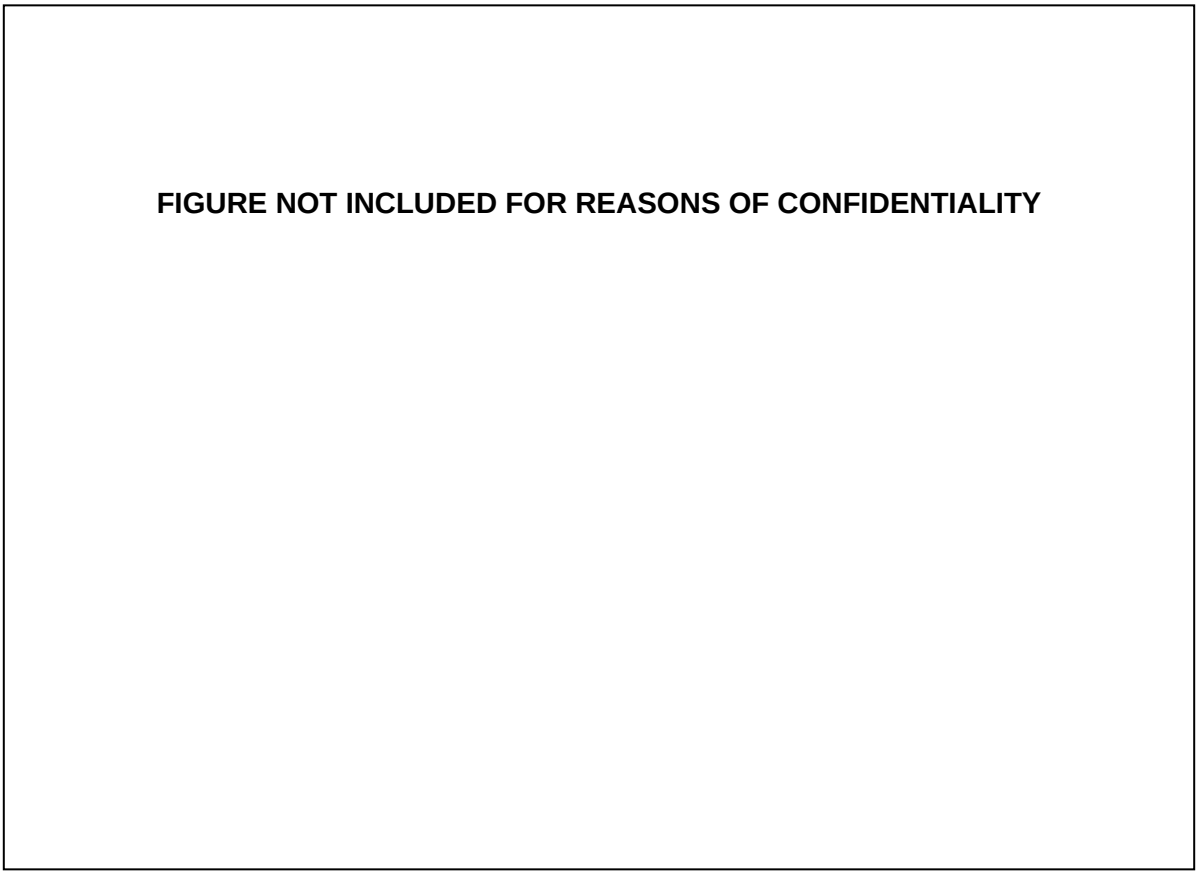


FIGURE 2
ORA-148 RECORDED SITE LOCATION

FIGURE NOT INCLUDED FOR REASONS OF CONFIDENTIALITY

6.1.2 CA-ORA-839

SITE SUMMARY: CA-ORA-839 (LOCI A–E)

Site Summary: CA-ORA-839 (Loci A–E)	
Beads	1 spire-lopped Olivella; 1 spire-lopped Conus (same Unit, Locus A); shark centrum vertebra (Locus B)
Bone	See Appendix B
Debitage	196 specimens (30/m^3); 170 gm.
Fire-affected Rock	
Fishbone	See Appendix B
Obsidian	4 pieces tertiary thinning flakes
Projectiles	Possible fragments
Radiocarbon	1 shellfish date-3960 +/- 80 BP; 3040 cm.; MS3 Period
Shellfish	2645 non-repetitive elements (NRE) (406/m^3) ; representing 3 habitats
Tools	0.61/m^3
Control Units	8 excavation units
Elevation	40 ft
Shovel Test Pits	0
Site Area	Ca. 3,500 m^2 existing: originally 4.3 acres
Site Depth	60-120 cm
Time Period	Paleocoastal (?) (see Van Horn 1980); MS3 Late Millingstone-early Intermediate
Surface Collection	NA
Volume Excavated	6.5 m^3 (eight 1x1 m units)
cm=centimeter ft=feet gm=grams m=meter m^2=square meters m^3=cubic meters (see Appendix C, Exhibit 1)	

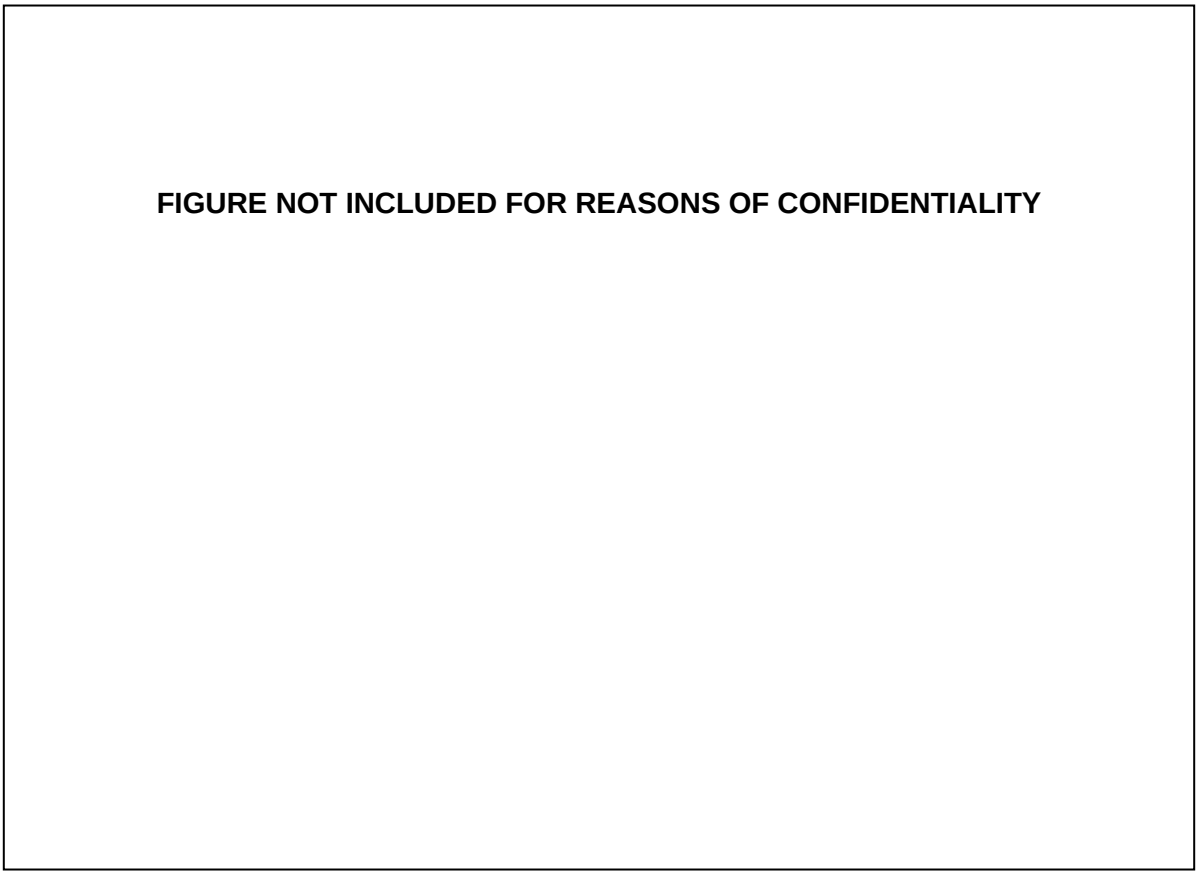
One of the earliest archaeological sites recorded for the property, CA-ORA-839, has been subject to the most archaeological investigation (Hall 1975; Van Horn 1980, 1982). This site, originally recorded by Hall (1975), was considered in 1980 because a new well location was planned. The proposed well site coincided with Locus B of CA-ORA-839 (see Figure 4), requiring investigation by Van Horn (1980:1). Van Horn's investigations were not an archaeological test of the entire site (CA-ORA-839), but of a single "locus" of the site resulting from prior grading activities. In spite of apparent surface grading disturbances, Van Horn's efforts included approximately 23 square meters of excavation. These excavations included 1 x 1 meter units and expanded units utilized to expose larger cultural features; however, it is not clear why so many excavation units were completed. Van Horn's work not only verified subsurface materials, but resulted in the discovery of multiple stratigraphic components to the site (discussed below). These observations warranted his recommendation for further evaluation (Van Horn 1980:4). Van Horn's recommendations included the avoidance of Locus B as well as the other site loci, enforced by fencing each location.

While Van Horn's 1980 effort focused his work on Locus B, he later conducted an assessment for cultural resources on the property, including survey and testing activities (Van Horn 1982). Van Horn's results, including prior survey attempts, recognized six archaeological sites: CA-

ORA-148, CA-ORA-839, CA-ORA-843, CA-ORA-844, CA-ORA-845, and CA-ORA-906. In summary, Van Horn concluded that:

> Ora-148 and 845 have been tested in recent years and are no longer regarded as significant. Ora-839 and 843 have been tested and are regarded as very significant. Ora-844 and 906 have not been tested and their significance is presently uncertain.

FIGURE 3
ORA-839 AERIAL VIEW; NOTE SURFACE DISTURBANCE AND BARROW PIT NORTH OF LOCUS C



Since the work of Van Horn, various cultural resource investigators (Drover and Smith 1999, and LSA 2008) have been unable to acquire certain documents initially recorded by Van Horn, resulting in the inability to relocate several archaeological sites (e.g., CA-ORA-839 Locus E, CA-ORA-148, CA-ORA-843, and CA-ORA-906). The present effort has acquired several of Van Horn's unpublished documents, which have greatly served to support his earlier finds.

The present approach is a combination of recommendations compiled through the years, including those by Van Horn (1982); Drover and Smith (1999) and LSA (2008).

Van Horn's determination of "significance" for CA-ORA-839 was based on his excavations of 1980 (noted above), which were solely focused at Locus B. The present effort to evaluate the NRHP eligibility of Newport Banning Ranch's cultural resources has chosen to conduct limited testing at each loci of CA-ORA-839. The geographic extent of CA-ORA-839 is apparent due to the distinct topography of the site. The focus was to provide quantitative data for comparison. Van Horn's results did not produce quantitative data regarding the comparative density of

cultural materials from different loci. Density data would allow the comparison of CA-ORA-839to larger projects such as the Newport Coast Archaeological Project and to further evaluate its ability to "contribute to science". Such comparisons would allow for the estimation of site type (function), as well as the site's ability to address certain environmental research questions, all of which would contribute to determining eligibility for listing in the NRHR.

To provide these data, BonTerra Consulting excavated two 1 X 1 meter control excavation units for Loci A, B, and C, while Loci D and E were limited to one 1 X 1 meter control unit each (due to topographical constraints). Locus E had not been mentioned in Van Horn's work (1980), nor relocated by Drover and Smith (1999) or LSA (2008). Van Horn does note "Locus E" in his 1982 document, which indicates it was recorded as a result of his later survey work (1982:39). A loose map in materials received from Archaeological Associates indicated the location of "Locus E" at the base of the mesa upon which CA-ORA-839 exists. This locus was not tested, and its relationship to CA-ORA-839 (other than proximity) was not clear (1982:39).

As noted above, each locus is a remnant of the grading for oil well pads and access. The soil removed was taken into the wetlands for road fill. The least disturbed locus (approximately 1,400 square meters [m^2] in size), based on topography and plant growth, is the northernmost Locus C. The remaining upper Loci A, B, and D are likely missing some of the upper levels of the midden. Locus D appears to have been disturbed to the point of the exhaustion of any cultural integrity. Locus E at the base of the bluff has been spatially disturbed by quarrying activities, but still has some vertical integrity.

Van Horn suggested that as much as 70 cm. (Period 1) was missing topographically from the top of Locus B, yet the remaining "Period 2" consisted of three phases, including a potential pre-Millingstone Horizon phase. Van Horn acknowledges that the interpretation of a Phase 2 and 3 of Period 2 is based solely on one unit, 19B (1980:43).

FIGURE 4
NEW TEST UNITS ORA-839 LOCUS B
(AFTER VAN HORN 1980:55)

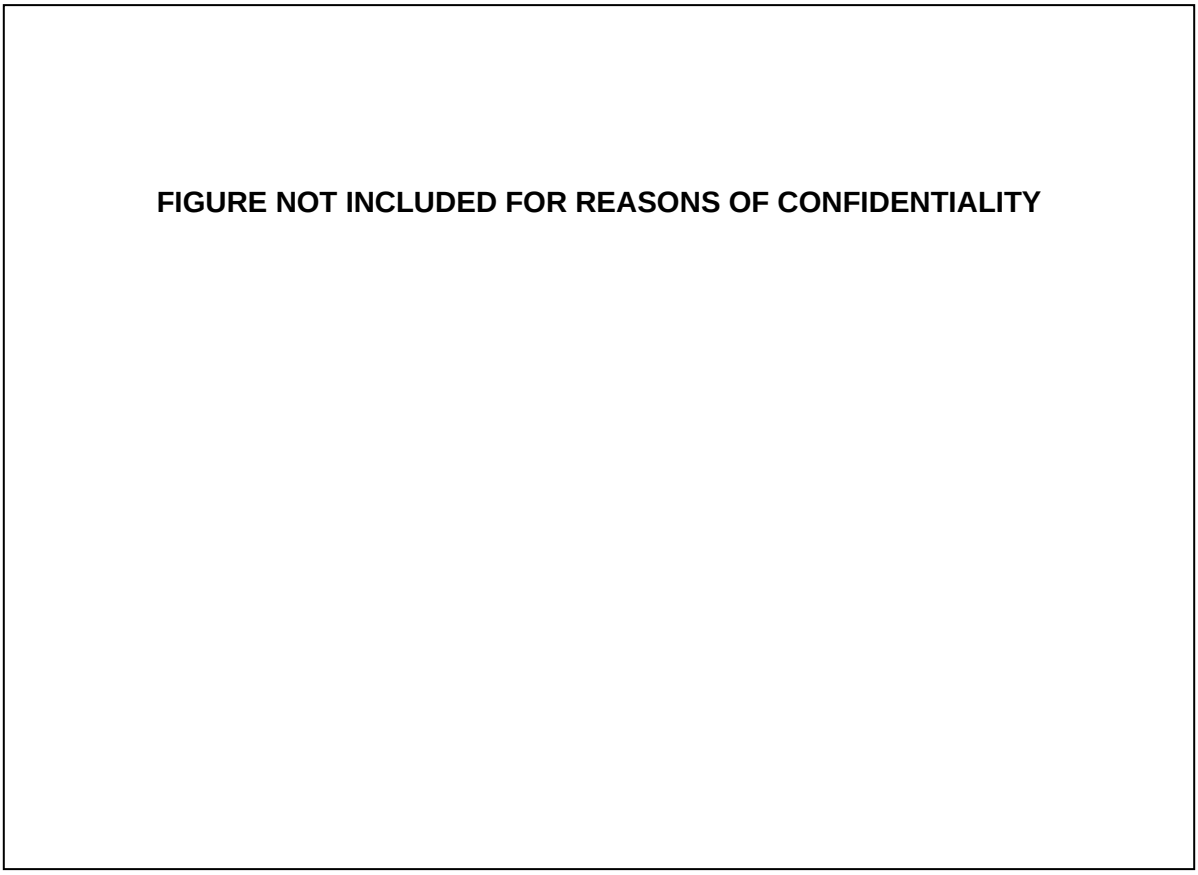


FIGURE 5
ORA-839 LOCUS B VAN HORN (1980:56)

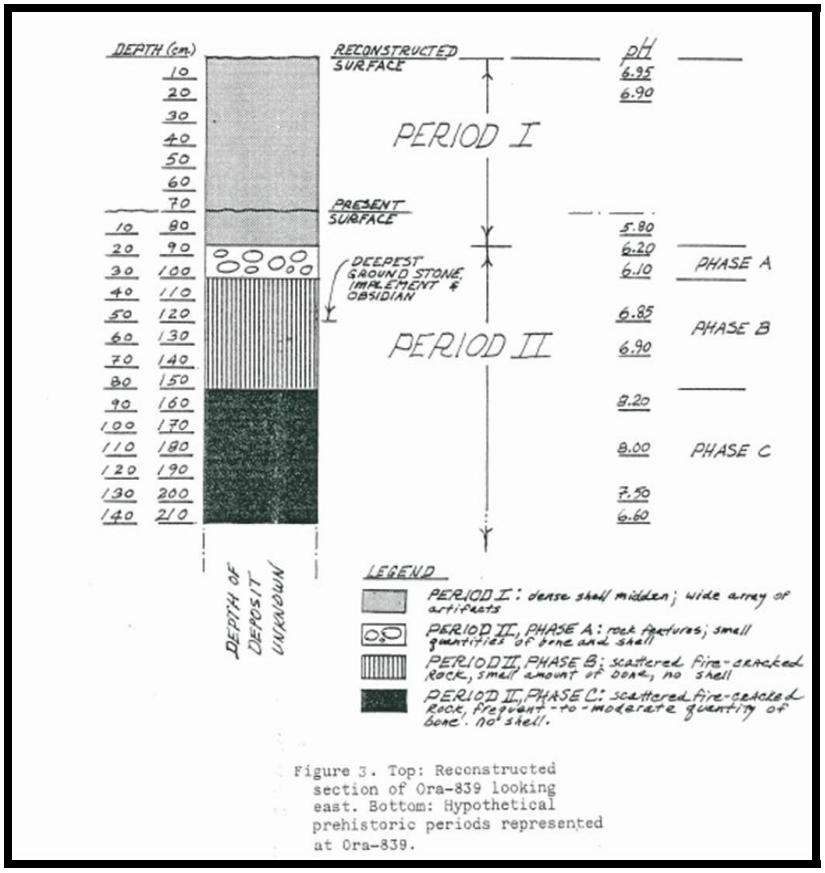


Figure 3. Top: Reconstructed section of Ora-839 looking east. Bottom: Hypothetical prehistoric periods represented at Ora-839.

In many ways the present, limited test results agree with Van Horn's general findings of 1980. A feature was encountered in the 30–40-cm level of Unit 1, Locus C of CA-ORA-839. The feature contained well associated shell with a ^{14}C date of 3960 +/- 80 YBP; Beta-261339, (MS3-late Millingstone Horizon/early Intermediate), from a unit which extended to the depth of 70–80 cm.

FIGURE 6
FEATURE 1 LOCUS C ORA-839; 14C

FIGURE NOT INCLUDED FOR REASONS OF CONFIDENTIALITY

	NRE	Percent	Habitat
Chione spp.	1,030	40	B/E
Argopectin	584	23	B/E
Ostrea lurida	504	20	B/OC
Neverita reclusianus	113	4	
Crepidula	83	3	
Astraea undosa	72	3	
Psuedochama	64	2	
Cerithidea californica	37	1	
Gastropoda	36	1	
Mytilus	11	0	
Calyptrea	10	0	
Saxidomus	10	0	
Bursa	5	0	
Tegula	4	0	
Hinnites	3	0	
Laevicardium	3	0	
	2,569		

Aside from site function, many of the general characteristics of CA-ORA-839 reflect pre-Intermediate or Milling Stone Horizon occupation. Shell and lithic density is comparatively low at the site similar to other sites of similar age. The cubic meter (m^3) density for shellfish non-

repeating elements (NRE) is 404/m^3. *Chione* spp. represents 40 percent of the NRE count, with Argopectin at 23 percent and *Ostrea lurida* at 20 percent. The dominating habitats are Bay/Estuary and Bay/Outer Coast, which are in keeping with the immediate river mouth estuary.

Van Horn's shellfish recovery results (solely from Locus B) reflect the same three prominent species; however, scallops (*Plagioctenium circularis* [sic]; cf. Argopectin) are the most abundant instead of *Chione* spp. The Newport Coast Archaeological Project summarized shellfish Taxa chronologically to compare the Milling Stone Period to the Late Prehistoric Period (Mason and Peterson 1994:267). A distinct difference was noted between the Newport Coast Archaeological Project Milling Stone and Late Prehistoric Periods. In descending frequency, the 3 dominant Millingstone Period Taxa are *Mytilus* sp. (78 percent), *Pollicipes polymerus* (5 percent), and *Amaea* sp. (3 percent), indicating rocky shore habitat exploitation. The Late Prehistoric Period dominant Taxa are represented in order by *Argopecten* sp. (39 percent), *Ostrea lurida* (19 percent), and *Crepidula* sp. (14 percent). At CA-ORA-839, the aggregate shellfish Taxa strongly reflect the Newport Coast Archaeological Project's Late Prehistoric Period (1994:267). The high frequency of *Chione* spp. at CA-ORA-839 is likely due to the geographic proximity of the limited shellfish habitats provided by the Santa Ana River mouth estuary. In addition, however, *Chione* spp. is the most dominant species at Newport Coast Archaeological Project sites, which are Minor Residential Bases (Mason and Peterson 1994:270).

Lithic material was poorly represented at CA-ORA-839 at a cubic meter density of 30/m^3, (196 specimens-170 grams), which likely reflects site function (see below).

	Count	Percent
metavolcanic	56	31
Monterey chert	42	23
quartzite	27	15
chert	21	12
quartz	10	6
rosy quartz	9	5
andesite	8	4
obsidian	4	2
diorite	1	1
galucophane schist	1	1
jasper	1	1
	180	
Cubic Shatter	109	83
Primary	4	3
Secondary	3	2
Tertiary	15	11

Metavolcanic rock represents 31 percent of the sample with Monterey chert at 23 percent and quartzite at 27 percent. Very few actual flakes were recovered with distinctive bulbs of percussion. Instead, the vast majority of material represented cubic shatter or very small finishing flakes. Stone tools were also limited in the sample. One bifacial mano fragment and two undetermined groundstone fragments were all that represented groundstone material. Two quartz cores (one fragmentary) and one fragmentary core with secondary use as a scraper were also recovered.

The poor representation of Lithic categories provided poor quantitative comparative data. Debitage consisting heavily of cubical shatter make up the vast majority of "debitage" for a density of 30/m^3. When compared to the Newport Coast Archaeological Project's determination

of Mean Densities by Site Type, CA-ORA-839 would compare best with a Minor Residential Base (Mason and Peterson 1994:248). Tool density at CA-ORA-839 of 0.65/m^3 best compares to a Specialized Activity Site (Mason and Peterson 1994:267).

While Van Horn's lithic data was not determined by density (m^3), he too reports limited lithic material (1980:35). As for flaked tools recovered by Van Horn, three cores, two projectile point fragments, six scrapers, and one notched blade are all that are noted (1980:35). Based on the excavation of 22 units (of different depths), this density might approximate 0.70/m^3. In addition to the lack of finished tools, the amount of small shatter and very small flakes may indicate limited resharpening of existing tools. Van Horn may not have quantified the category of "cubic shatter" analyzed herein.

Van Horn's recovery of milling stone amounted to six specimens, all manos, and only one was complete (1980:38). Van Horn noted that no ground stone specimens were found below 60 cm in depth, and due to several trends, suggested that the lower parts of the site may pre-date the onset of the Milling Stone Horizon(i.e. prior to 6,000 YBC) (1980:38).

Faunal specimens from the site include fishes, migratory birds, and limited mammal material (see Appendix B). The majority of fishes indicate shallow water, in shore, and estuary species. Only one specimen of California Sheephead represents a separate habitat. While Van Horn does not provide species identification in his faunal analysis, he does separate fish vertebra from other bone material and suggests that bone is more common in the lower levels. While the present investigation sample size does not compare with Van Horn's sample size, there is no indication of bone being more common in lower levels. According to bone count in 7 control units of the present investigation, 121 specimens occur between 0 and 50 cm, and 94 occur between 50 and 100 cm.

With results primarily from Locus B and limited excavations at Locus A, Van Horn suggested two major Periods of occupation. Period 1 the mostly destroyed upper levels (0–90 cm), represents the Late Prehistoric Horizon, consisting of dark soil with an emphasis on shellfish and underlain by "Period 2" (Van Horn 1980:41-45; 56). Period 2 consists of three phases, which include light soil color, a shift toward the exploitation of scallops, and diminishing groundstone. Period 2 consisted of a shift from the Milling Stone Period to a pre-Milling Stone (cf. Paleocoastal) Period. Van Horn notes that his assumptions regarding Period 2 at CA-ORA-839 were based primarily upon the findings from one 1 X 1 meter unit at Locus B (1980:43).

Based upon the excavation of seven 1 X 1 meter control units distributed throughout all five site loci, the following conclusions can be made. Based on observation made at CA-ORA-839 based on topography, soil color and ^{14}C dates, it is quite possible the site has multiple chronological components (vertical and spatial). The existing ^{14}C date from the site indicates the likelihood for an Intermediate Period and Milling Stone Period occupation. While the existence of a "pre-Milling Stone Period" is unknown, the likelihood of an upper, Late Prehistoric occupation is possible. Local sites with two or three occupation components are relatively rare and certainly significant. Enough of CA-ORA-839 is physically intact to address these chronological issues with ^{14}C analysis of marine shell. A remaining pertinent issue is whether Locus E at the base of the bluff is truly a contemporary component of CA-ORA-839 or an individual site unto itself.

Given the topographic location and faunal and lithic material obtained in this sample, by comparison to the results of the Newport Coast Archaeological Project, CA-ORA-839 appears to be a Minor Residential Base (Mason and Peterson 1994:270). To a limited degree, male and female activities, food procurement, and food-processing activities all seem to have occurred at the site. While trade items (obsidian) and socio-ideological items (beads) are represented at the site, their limited quantities may reflect a limited duration of occupation. Given the limited regional knowledge of the occupation and habitat of the area, CA-ORA-839 can provide unique

chronological and subsistence information and change about two or possibly three prehistoric cultural periods. The site does possess the integrity and distinction to warrant listing in the NRHP or CRHR as a historical and/or unique resource.

6.1.3 CA-ORA-843

Site Summary: CA-ORA-843	
Beads	none
Bone	none
Debitage	none
Fire-affected Rock	none
Fishbone	none
Obsidian	none
Projectiles	none
Radiocarbon	NA
Shellfish	15 NRE; 12 Chione spp.; 2 Argopecten; 1 Astrea undosa
Tools	none
Control Units	none
Elevation	40 ft
Shovel Test Pits	8
Site Area	Ca. 15 m^2 existing disturbed area: originally 3 acres
Site Depth	40 cm
Time Period	unknown
Surface Collection	NA
Volume Excavated	Eight Shovel Test Pits—ca. 4m^3
ft=feet cm=centimeter m^2=square meters m^3=cubic meters (see Appendix C, Exhibit 2)	

CA-ORA-843 was once likely a large site (approximately three acres) on a prominent point on the bluff overlooking the Newport Shores Community. Due to the degree to which the site has been impacted by grading and oil field activities, the exact location and integrity of the site has been difficult to ascertain. The site was first recorded by Hall (1975), independently by Murray in 1979, and updated by Drover and Smith in 1999 (LSA 2008). The lack of specific records information regarding the location of the prior testing by Van Horn (1982) at the SCCIC, combined with a paucity of observable midden or artifacts, hampered the understanding of the status of the site (LSA 2008:56). CA-ORA-843 was tested with postholes by Van Horn and found to be significant (1982:20; 25).

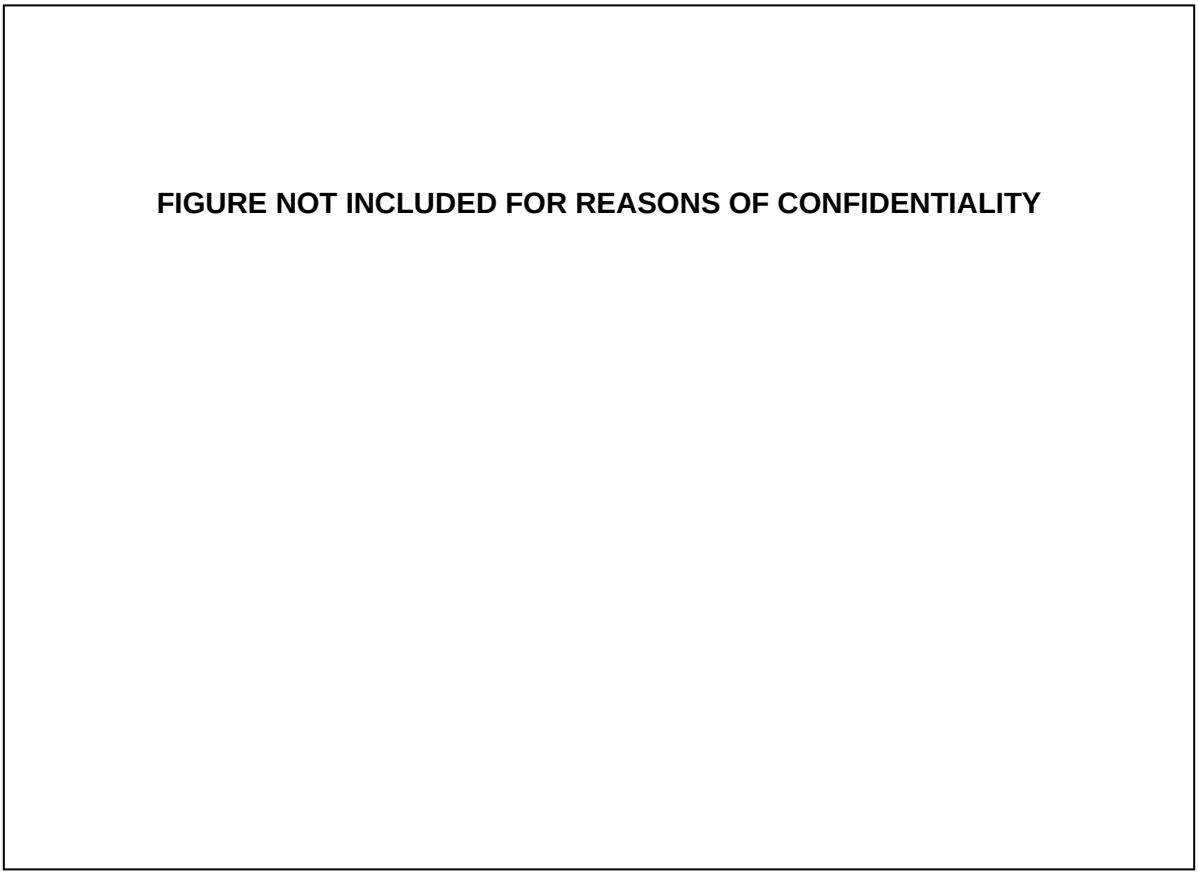
The present investigation chose to retest CA-ORA-843 due to the lack of information about the location of the prior test areas and the criteria of the significance determination. A photograph and description of the site in Van Horn's test report recovered from Archaeological Associates, was able to focus the present test activities. Van Horn's test was conducted on a remaining portion of the site only 40 feet in diameter. Only one of an unknown number of postholes recovered any midden materials (1982:33). The information from this single post-hole indicated a

> "….midden rich in marine shell, exhibited positive midden soil chemistry (high phosphate content) and extended to a depth that exceed one meter (the maximum depth of the auger bit)" (1982:33).

This information was the basis for the significance determination. A welded fence also indicates an area of Van Horn's concern. The remaining area tested by Van Horn is highly disturbed with historic debris mixed into the soil and is completely covered with ice plant. The area remained undisturbed from prior grading due to a large electric transformer that stood in this location. As can be seen in Appendix C, Exhibit 2, Drover and Smith stated that the site "no longer exists" and did not recommend testing (1999:18). However, STP testing was recommended by LSA (2008:66).

The present test activities consisted of eight STPs, six of which were focused in the area fenced by Van Horn and two others in potential areas where brush inhibited a view of the surface. Of the 6 units within the 40-foot-diameter fenced area, only 2 produced any cultural material. One was closed for the lack of further data at 40 cm, and the other closed at 60 cm.

FIGURE 7
CA-ORA-843 REMNANT MIDDEN AREAS



The only cultural data recovered from the 6 STPs were 15 pieces of shell: 7 from 0 to 20 cm, 5 from 20 to 40 cm, and 3 from 40 to 60 cm. The NRE of 15 shells included 1 *Chione californiensis*, 2 *Chione undatella*, 9 *Chione* spp., 2 *Argopecten*, and 1 *Astrea undosa.* The small area that produced these few specimens was highly disturbed by grading, intrusive phone poles, trash, and erosion. Based on present observations, it is difficult to understand Van Horn's estimation of the site's significance. CA-ORA-843 lacks any vertical or horizontal integrity as well as representative data to address relevant research questions. The site does not possess the integrity or distinction to warrant listing in the NRHP or CRHR as a historical resource, nor does it meet the criteria for a unique archaeological resource.

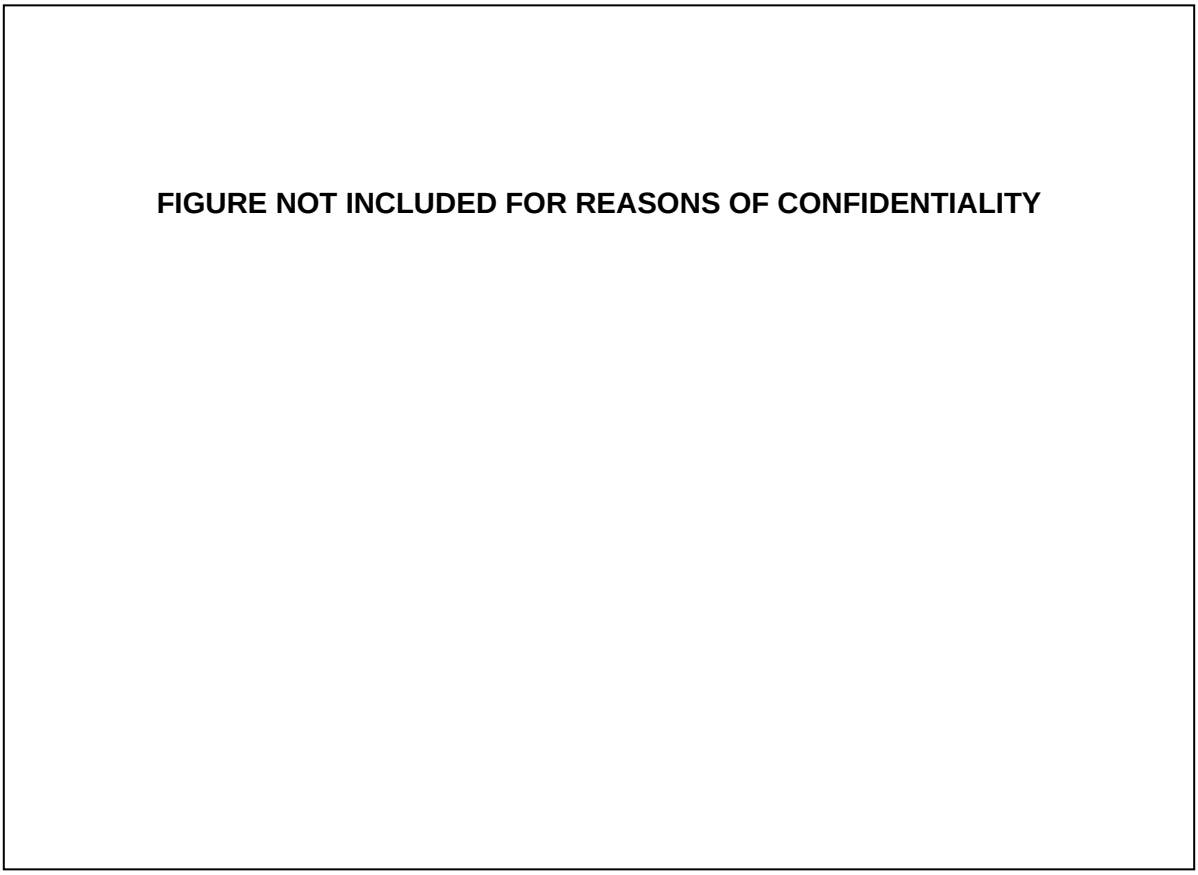
6.1.4 CA-ORA-844 (Locus A + B)

Site Summary: CA-ORA-844 (Locus A + B)	
Beads	none
Bone	9-Locus B small mammal
Debitage	7-Locus B
Fire-affected Rock	1-Locus A
Fishbone	1 shark centrum
Obsidian	none
Projectiles	none
Radiocarbon	None—recommended
Shellfish	Control Unit 1: NRE of 443/m^3
Tools	none
Control Units	1
Elevation	35 ft
Shovel Test Pits	Locus A 7 Shovel Test Pit (ca. 0.5m^3); Locus B 3 Shovel Test Pits (ca, 0.3m^3)
Site Area	Locus A ca. 15 m^2 existing disturbed area: Locus B 15 m^2
Site Depth	60 cm
Time Period	unknown
Surface Collection	NA
Volume Excavated	Locus A 7 Shovel Test Pit (ca. 3m^3); Locus B 3 Shovel Test Pits (ca, 1.5m^3) and 1 Control Unit (ca. 0.7m^3)
ft=feet cm=centimeter m^2=square meters m^3=cubic meters (see Appendix C, Exhibit 3)	

Similar to several sites, CA-ORA-844 was originally identified by Hall (1975), but formally recorded in the SCCIC by Murray in 1979. CA-ORA-844 was not tested by Van Horn in 1982, but was determined to be worthy of testing (1982:33-35). Locus A, described as being 40 by 60 feet in size, was completely covered by ice plant and had undulating topography suggestive of disturbance (Van Horn 1982:33). The site was noted to have a locus on either side of a road (the main thoroughfare from the bluff top to the oil fields), but subsequent archaeological surveys did not mention nor relocate Locus B (Drover and Smith 1999:19; LSA 2008:67). However, with consideration primarily for Locus A, both Drover and Smith (1999) and LSA (2008) recommended testing.

Initial testing undertaken at both loci consisted of STPs. Those excavated at Locus A consisted of seven units laid out on the compass axes, three oriented north-south and four oriented on the longer east-west axis. Only three STPs were laid out on a north-south axis at Locus B due to the limited amount of undisturbed (not eroded) terrain. Locus B is located approximately 80 meters north of Locus A on a slightly elevated hillside with severe erosional cuts. While Van Horn speculated that the two loci may have at one time been connected or contemporary components of one another (1982:35), no evidence was observed to substantiate the idea.

FIGURE 8
ORA-844 LOCUS A AND B – REMNANT MIDDENS



Locus A produced a limited amount of shell, primarily from STPs 3, 4, 5, and 6 in the western half of the grid nearest the road intersection (see Appendix C, Exhibit 3). Of the four STPs noted above, all produced limited shell in the 40–60 cm level; however, 2 STPs (5 and 6) produce shell in the 60–80 cm level. In all, the NRE shell count from all STPs was 36.

	0-20cm	20-40cm	40-60cm	60-80cm
Chione spp.	3	6	3	
Chione californiensis	1			
Argopectin sp.	3	2	6	2
Ostrea lurida	1	2	3	1
Hinnites sp.			1	
Mytilis sp.				1

The shell recovery was sparse, and no other prehistoric cultural materials were recovered with the exception of a single, fire-cracked rock. Given the undulating surface of this portion of the site (+/- 3 to 4 feet), the recovery of historic material, size of the deposit and sparse shell, the ability of Locus A to address the proposed research questions is highly doubtful. Since it is recommended that Locus B qualifies in its ability to fulfill eligibility criteria (see below), a control unit excavated at Locus A may provide an adequate radiocarbon sample to determine the contemporanaeity of Loci A and B.

Locus B, as noted above, is located on a hillside transected by two erosional cuts in excess of six feet in depth. The western side of the site is absent due to the construction of an oil pad. Very little midden is intact at this site that is not disturbed (approximately 10–15 m^2).

Of the three STPs excavated at Locus B, STP 1 produced cultural materials and soil integrity to a depth of 60 cm, suggesting the need for the excavation of a Control Unit. The control produced three data classes: shell, lithics and bone, with shell being the largest. Shell represented from Control Unit 1 consisted of an NRE of 443, a surprising density giving the unit was only excavated to the depth of 60 cm. (The cubic meter density for shellfish NRE) is 404/m^3.) The diversity of Taxa ("richness") in such a small sample is also promising in the reconstruction of the habitat and food procurement strategies. The lithic material in the unit amounted to seven specimens of debitage, all of which were shatter. Faunal material from the unit included six small mammal bones and one shark centrum. Radiocarbon dating was not conducted.

Taxa	NRE	Percent
Chione californiensis	134	31
Chione spp.	99	23
Crepidula sp.	93	21
Astrea undosa	25	6
Ostrea lurida	20	5
Cerithidea sp.	18	4
Argopectin sp.	12	3
Saxidomus nuttali	12	3
Neverita reclusianus	11	3
Chione undatella	8	2
Acanthina spirata	2	0
Calyptraea sp.	2	0
Chione fluctifraga	1	0
Nassarius mendicus	1	0

Based on the data retrieved from one unit, it is impossible to reconstruct site type; however, the cubic meter shell density and species frequency is favorable to the Minor Residential Base pattern suggested by Mason and Peterson (994:270).

The remaining portion of the site has the capability to at least address the temporal setting of the site and its subsistence patterns. It is possible that other recovered data classes may contribute to other questions proposed in the research design. Given the limited regional knowledge of the occupation and habitat of the area, CA-ORA-844, Locus B may yet yield information important in prehistory; therefore, the site does possess the integrity and distinction to warrant listing in the NRHP or CRHR as a historical resource. It does not meet the standards of a unique archaeological resource.

6.1.5 CA-ORA-845

Site Summary: CA-ORA-845	
Beads	None
Bone	None
Debitage	None
Fire-affected Rock	None
Fishbone	None
Obsidian	None
Projectiles	None
Radiocarbon	None
Shellfish	NRE 25 *Chione californiensis; Ostrea lurida* and *Chione* spp.*-sparse distribution*
Tools	None
Control Units	None
Elevation	ca. 20 ft
Shovel Test Pits	10
Site Area	Unknown; destroyed
Site Depth	220 cm
Time Period	Unknown
Surface Collection	NA
Volume Excavated	10 STP's = ca. $5m^3$
ft=feet cm=centimeter m^2=square meters m^3=cubic meters STP=shovel test pit YBP=years before present (see Appendix C, Exhibit 4)	

Similar to several sites noted above, CA-ORA-844 was originally identified by Hall (1975) but formally first recorded in the SCCIC by Murray in 1979. Hall originally described the site as consisting of dark soil, fire-cracked rock and shellfish, covering an area of 50 meters by 150 meters, and noted that only 20 percent of the site remained intact. Van Horn conducted an archaeological test at this site in 1981 consisting of four Control Units and a series of postholes on the compass axis (Van Horn 1982:29). Van Horn's results stated that "…no significant deposit is present at this site" (1982:29). Van Horn also noted that the site area had been heavily impacted by quarrying activities. No subsequent archaeological survey has been unable to relocate the site (Boxt and Barretta 1992, Drover and Smith 1999, and LSA 2008).

Since occasional shell appeared on the surface of one of the two loci shown on the site record, ten STP's were distributed and excavated in areas where either soil color or topography indicated non-sterile (less disturbed) soil conditions. It appeared topographically that the once "top" of the site may have, as in many other areas, been graded and soil removed.

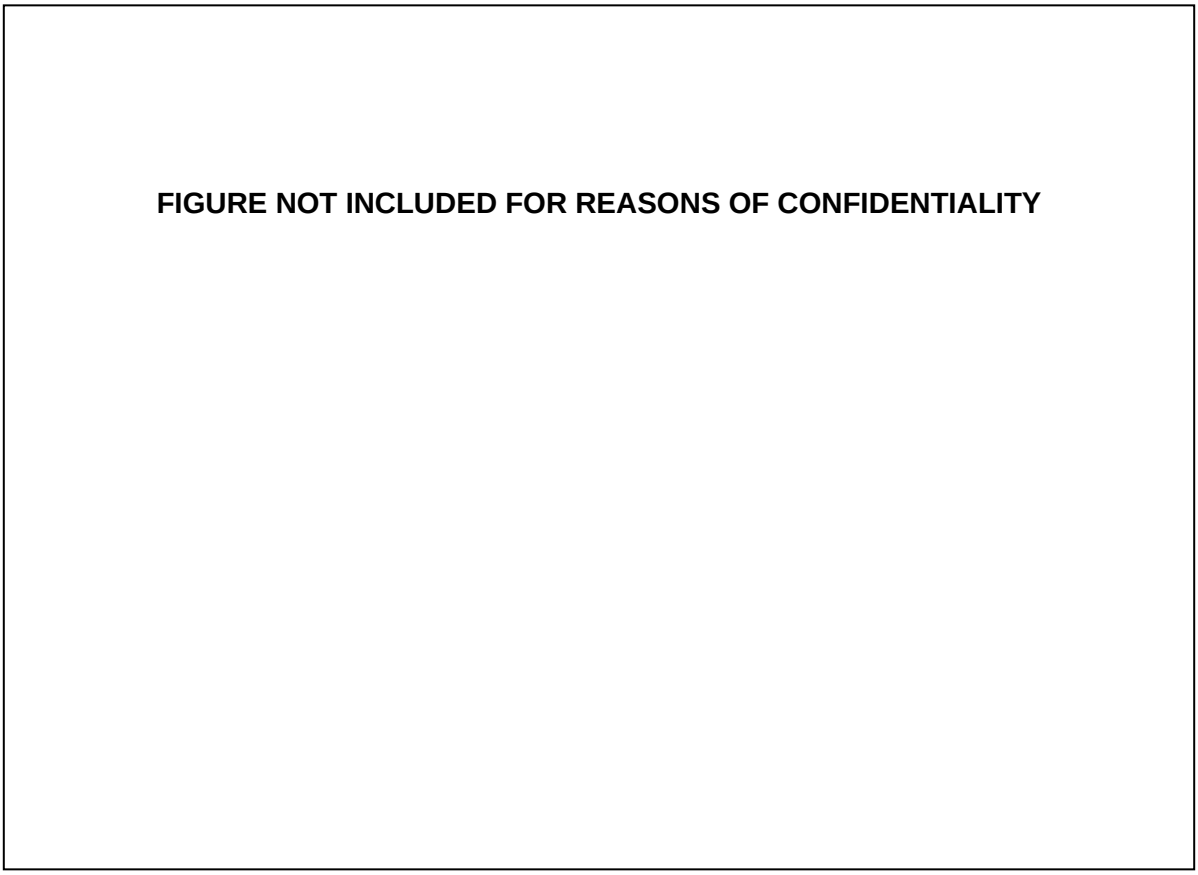
Of the ten STPs (eight on the lower, larger mapped locus and two on the upper, smaller locus), the only material recovered was shell from the lower locus. The deepest STP went to 60 cm. The total NRE for shell recovered from all of the 8 lower STPs was 25 (8 *Chione californiensis*; 12 *Ostrea lurida*; and 5 *Chione* spp.). No other cultural material was recovered. Due to the impact to this area, findings are in agreement with Van Horn (1982) that the site no longer exists and lacks any physical integrity. Therefore, the site does not possess the integrity or distinction to warrant listing in the NRHP or CRHR as a historical resource, nor does it meet the criteria for a unique archaeological resource.

6.1.6 CA-ORA-906

Site Summary: CA-ORA-906	
Beads	none
Bone	See Appendix B
Debitage	none
Fire-affected Rock	none
Fishbone	See Appendix B
Obsidian	none
Projectiles	none
Radiocarbon	1330 +/- 70 YBP; (Beta 261340-- LP1 Late Prehistoric) and 2340+/- 80 YBP; (Beta 261341—LP1 Late Prehistoric).
Shellfish	Control Unit 1: NRE 447
Tools	none
Control Units	1
Elevation	Ca. 20 ft
Shovel Test Pits	0
Site Area	Unknown; buried
Site Depth	220-240 cm
Time Period	unknown
Surface Collection	NA
Volume Excavated	Unit 1 – ca. $2m^3$
ft=feet cm=centimeter m^2=square meters m^3=cubic meters YBP=years before present (see Appendix C, Exhibit 1)	

CA-ORA-906 was recorded by Van Horn and Murray in 1980. The site was discovered during their work on CA-ORA-839 and was exposed in a road cut (see photograph Van Horn 1982:21). The site is located at the base of the bluff below CA-ORA-839 Locus D. This site could not be relocated by Drover and Smith (1999) or LSA (2008). Drover and Smith recommended that the site be relocated (1999:4), and LSA recommended that the site undergo STP/Unit testing (2008:68). While the existence of the site was in doubt (possibly confused with a fossil shell outcrop in the immediate area), CA-ORA-906 was able to be relocated with the aid of a photograph taken by Van Horn (1982:21). The road cut shell exposure photographed by Van Horn was extremely dense and was described as being partially buried by slump from the bluff just below CA-ORA-839 Locus D. The site was finally located in dense foliage under slump in the road cut running north-south at the base of the bluff below CA-ORA-839. (The road is also known as “Industrial Park Way”.) Upon clearing brush, a meter-side profile of the cut was cleared for purposes of observing the stratigraphy of the road cut. No shell or cultural material appeared in this profile. A similar effort seven meters to the north indicated cultural shell that did not belong to the Qsp (Quaternary San Pedro Formation: Palos Verdes Sand member) (GMU 2008: Plate 7). A 1 X 1 meter control unit was opened into the profile. Excavated in 10-cm levels, the first 80 to 90 cm (above the present road level) were sterile. At approximately 100 cm in depth (at the present road level or standing surface), dense shell began to appear and continued to a depth of approximately 200 cm. The overlying soil burying the midden, as suggested by Van Horn, is referred to as a Qls (Quaternary land slide) in the Project Geotechnical Report (GMU 2008: Plate 7). The site has been heavily disturbed by both road building and burial. It is impossible to estimate how much of the site remains intact.

FIGURE 9
ORA-906 SIDEWALL PROFILE



The excavation of the control unit in this site presented a unique combination of observations. The depth of the site, density of shellfish remains, unweathered appearance of the shell, lack of fire-cracked rock and lithics, and the procurement species focus of shellfish was noticed by many observers. In addition, the lack of soil and presence of a matrix comprised of small gravel is unusual, and may indicate the proximity of the site to a riverine channel.

Radiocarbon samples were submitted for the upper level (100–110 cm) and the lowest level (180–200 cm) of the dense deposit. The dates respectively are 1330 +/- 70 YBP (Beta 261340-LP1 Late Prehistoric), with a basal date of 2340+/- 80 YBP (Beta 261341-LP1 Late Prehistoric).

The density of shellfish and depth of the unit precluded complete sorting; however, a sample projection for shellfish density is a cubic meter NRE of 4470/m^3. Such a density is ten times that of CA-ORA-839. The focus on two primary species, *Ostrea* sp. and *Argopecten* sp., given the density of the shell and the size of shell specimens in the midden is interesting.

	Count	Percent
Ostrea lurida	257	57
Argopecten sp.	147	33
Crepidula sp.	26	6
Chione undatella	6	1
Chione spp.	3	1
Chione californiensis	3	1
Calyptraea sp.	3	1
Chione fluctifraga	2	0
	447	
(sample projection)		

Aside from CA-ORA-906's proximity to the Santa Ana River mouth estuary, dominance of *Argopecten* sp., and *Ostrea lurida* are also common to Late Prehistoric Newport Coast Archaeological Project sites.

While it is speculative to estimate site function from a single control excavation unit, the density of shell at CA-ORA-906 does not seem to match the lack of other data classes at the site. To some extent, seasonal use of the site may also be indicated by the number of winter migration waterfowl seen in the faunal collection (see Appendix B).

Only three artifacts recovered from the midden indicate Native American presence. A small shell fragment (possibly Haliotis) caked with asphaltum was recovered (#906-84), as was a small, circular shell bead (#906-29) and a utilized mammalian bone (possibly a shellfish pry) (#906-48).

The lack of any lithics or diagnostic fire-affected rock is also unusual given the shellfish density of the midden, which approaches that of a Major Residential site (Mason and Peterson 1994:270).

Regardless of the partial destruction of this site from road building and the difficulty of access given the land slide overlay, the site represents a third chronological period on the property, the Late Prehistoric. The data from this site could easily contribute to the research design categories of chronology and subsistence and settlement patterns. Again, little is known about the prehistoric use of the mouth of the Santa Ana River and its estuary; therefore, the data from this site could easily contribute to research questions regarding chronology and subsistence and settlement patterns; therefore, the site does possess the integrity and distinction to warrant listing in the NRHP or CRHR as a historical resource, nor does it meet the criteria for a unique archaeological resource.

6.1.7 CA-ORA-1599

Site Summary: CA-ORA-1599	
Beads	none
Bone	none
Debitage	none
Fire-affected Rock	none
Fishbone	none
Obsidian	none
Projectiles	none
Radiocarbon	None
Shellfish	NRE 10
Tools	None
Control Units	None
Elevation	Ca. 40 ft
Shovel Test Pits	6
Site Area	Original Unknown;
Site Depth	unknown
Time Period	unknown
Surface Collection	NA
Volume Excavated	6 STPs – ca. $3m^3$
ft=feet m^3=cubic meters (see Appendix C Exhibit 5)	

This site was recorded in 1990 by Smith et al. as part of the fieldwork associated with Phase I survey activities associated with Banning Ranch (Drover Smith 1999). The site (Br-4) was recorded as a widely scattered, sparse lithic scatter with two pieces of quartz shatter, one quartz flake, one quartz thinning flake, four chert thinning flakes, and one retouched/utilized chert scraper or core within an area measuring 50 meters by 10 meters. The site was located along a north-south oiled road (leading to pump No. 340), paralleling the western side of the old road cut at the southern end of the Ranch. Upon revisiting the site, LSA found no prehistoric lithics but identified some historic glass and transfer ware porcelain (2008:60). The present test efforts did also observe the historic glass and several shell fragments in the area intended for STPs; however, no lithic specimens were observed. Aside from a few areas with remnant topsoil, the area in question has been both graded and disked. It is difficult to determine the depth of any original cultural deposit. Most of the "soil" on the site actually consists of Qtm or Quaternary Marine Terrace, with grading having disturbed the past top soil or potential cultural deposits (cf. GMU 2080).

FIGURE 10
ORA-1599 AND ORA-1600

FIGURE NOT INCLUDED FOR REASONS OF CONFIDENTIALITY

Very limited cultural material was derived from three STPs (numbers 2, 5 and 6) at CA-ORA-1599.

STP 2 yielded an NRE of five shell: two *Chione* spp., one *Cerithidea californica*, one *Chione undatella*, and one *Crepidula* sp. at 20–40 cm. While these specimens are not fossil shell, a fragment of metal was found in the same level, indicating disturbance.

STP 5 (0–20 cm) yielded an NRE of four shells: *Chione* spp., numerous small fragments of *Argopecten*, and a fragment of *Ostrea* sp. and *Crepidila* sp. Three metal fragments were also found in STP 5 in the 0- to 20-cm level. In the 20- to 40-cm level, STP 5 produced only an NRE of 2 shell *Mytilus* sp. and *Chione* spp. with fragmentary evidence of *Argopecten*. No further cultural materials were found in STP 5.

STP 6 produced material only from the 0- to 20-cm level. Only fragmentary evidence existed for *Chione* spp. and *Mytilus* sp. and two small pieces of quartz shatter. The lack of cultural material, evidence of mixing with historic material, and obvious topographic disturbance leaves little to no value in these specimens.

The poor physical integrity of this site and resulting lack of cultural data available renders it impossible to provide any of the data requirements to address questions presented in the Research Design section above. The site, therefore, does not possess the integrity or distinction to warrant listing in the NRHP or CRHR as a historical resource, nor does it meet the criteria for a unique archaeological resource.

6.1.8 CA-ORA-1600

Site Summary: CA-ORA-1600	
Beads	None
Bone	None
Debitage	None
Fire-affected Rock	None
Fishbone	None
Obsidian	None
Projectiles	None
Radiocarbon	None
Shellfish	None
Tools	None
Control Units	7
Elevation	Ca. 40 ft
Shovel Test Pits	0
Site Area	Original Unknown
Site Depth	None
Time Period	Unknown
Surface Collection	NA
Volume Excavated	7 STPs – ca. 3.5m^3
ft=feet m^3=cubic meters STP=shovel test pit (see Appendix C, Exhibit 5)	

This site was recorded in 1990 by Smith et al. as part of the fieldwork associated with Phase I survey activities associated with Banning Ranch (Drover and Smith 1999). The site, directly east of CA-ORA-1599, was recorded as (Br-3), and consisted of a diffuse lithic scatter containing two pieces of quartz shatter, one quartz flake, two quartz thinning flakes, three chert flakes, and one retouched utilized chert core/scraper within an area of 25 meters by 10 meters. LSA's revisit to the site in 2008 noted one small milky quartz flake and one large (4- to 5-cm thick) secondary core reduction flake made of a brownish quartzite. Some shell was also observed in small quantities (LSA 2008:60). The distribution of materials recorded lie roughly on a north-south axis paralleling the eastern boundary of the property and bordered by an existing apartment complex. Just west of the apartments is an old fence line which more recent grading activities have avoided. The fence line has created a small berm of soil, slightly higher and less disturbed than the surrounding soils. The present testing efforts noticed small amounts of shell eroding out rodent burrows along this fence line. The two northernmost STPs of the seven excavated were placed along this fence berm. The fence alignment can be seen in Appendix C, Exhibit 5. It is obvious that the area in question has been both graded and disked. It is difficult to determine what depth any original cultural deposit may have had. Most of the "soil" on the site actually consists of Qtm or Quaternary Marine Terrace, with grading having disturbed the past top soil or potential cultural deposits (cf. GMU 2080).

All of the STPs excavated in the mapped location of this site returned negative cultural material. The lack of cultural material, evidence of surface historic material, and obvious appearance of topographic disturbance leaves little to no value in these specimens. The site, therefore, does not possess the integrity or distinction to warrant listing in the NRHP or CRHR as a historical resource, nor does it meet the criteria for a unique archaeological resource.

The poor physical integrity of this site and resulting lack of cultural data available renders it impossible to provide any of the data requirements to address questions presented in the Research Design section above.

6.2 HISTORIC SITES

6.2.1 CA-ORA-1601H

Site Summary: CA-ORA-1601H	
Beads	none
Bone	none
Debitage	none
Fire-affected Rock	none
Fishbone	none
Obsidian	none
Projectiles	none
Radiocarbon	none
Shellfish	none
Tools	none
Control Units	none
Elevation	70 ft above msl
Shovel Test Pits	2
Site Area	3x3 meters
Site Depth	unknown
Time Period	Early 20th Century
Surface Collection	Yes
Volume Excavated	2 STPs – ca. .5m^3
ft=feet m^3=cubic meters msl=mean sea level (see Appendix C, Exhibit 6)	

This site was recorded in 1990 by Smith et al. as part of the fieldwork associated with Phase I survey activities associated with Newport Banning Ranch (Drover and Smith 1999). The site was initially recorded as Br-2, and consists of historic trash eroding out of the inside curve of a dirt road as it crests atop a small mesa in the southeasternmost corner of the property. The site was initially recorded as a 2 meter by 2 meter area of historic trash. The site was relocated as described.

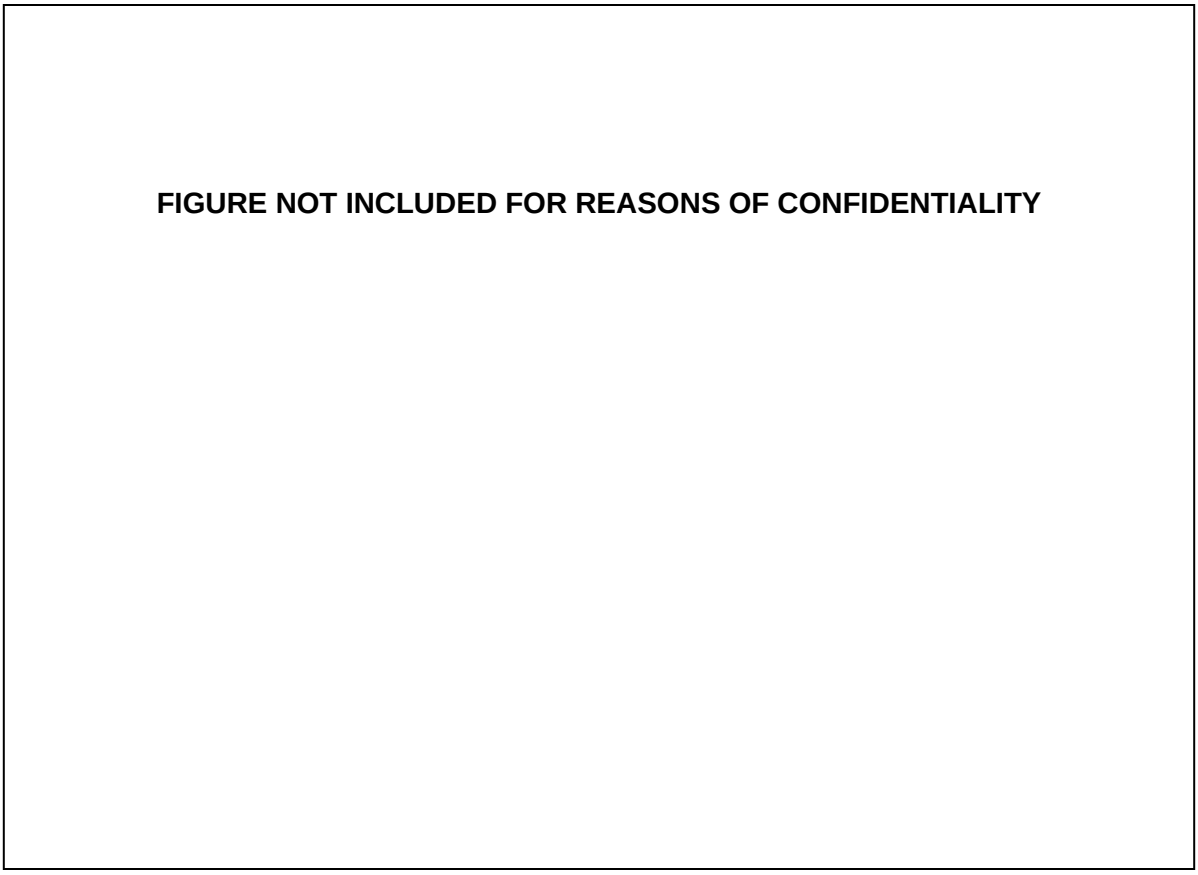
CA-ORA-1601H is approximately 0.4 km east of the West Coast Highway entrance to the West Newport Oil field (Armstrong Oil), also known as Newport Banning Ranch, on the eastern bank of a broad drainage that runs beneath Coast Highway (Appendix C, Exhibit 6). This site lies on the edge of a highly eroded, graded upland terrace, which upon surface inspection yielded 4 artifacts associated with the early 20th Century. In addition to surface inspection, shovel test pits (n=2) were excavated at a three-meter interval resulting in no positive tests or evidence of subsurface deposits within an area measuring approximately ten meters in diameter. No intact cultural lenses or structural remains were present. Materials recovered include one milk glass cold cream jar, two amethyst glass bottle finish, and one aqua glass bottle base.

The age of this site (early 20th Century) indicates that there is no temporal relationship with CA-ORA-1610H, the Costa Mesa Gun Battery noted below. While the remains of the Battery foundations are within 100 meters, no cultural relationship exists. The location of the site along

an open bluff exposure facing south suggests that the exposure may have served as an occasional dump at the turn of the century.

This site does not possess the integrity or distinction to warrant listing in the NRHP or CRHR as a historical resource, nor does it meet the criteria for a unique archaeological resource. No further work is recommended. The testing activities exhausted the data available from this site.

FIGURE 11
SITE LOCATIONS ORA-1601, 1602, AND 1610



6.2.2 CA-ORA-1602H

Site Summary: CA-ORA-1602H	
Beads	none
Bone	none
Debitage	none
Fire-affected Rock	none
Fishbone	none
Obsidian	none
Projectiles	none
Radiocarbon	none
Shellfish	none
Tools	none
Control Units	none
Elevation	65 ft above msl
Shovel Test Pits	1
Site Area	2x4 meters
Site Depth	unknown
Time Period	Late 19th/Early 20th Centuries
Surface Collection	Yes
Volume Excavated	1 STP – ca. .2m^3
ft=feet m^3=cubic meters msl=mean sea level STP=shovel test pit (see Appendix C, Exhibit 6)	

This site was recorded in 1990 by Smith et al. as part of the fieldwork associated with Phase I survey activities associated with Newport Banning Ranch (Drover and Smith 1999). The site was initially recorded as Br-1, a historic trash dump located along the northern side of a dirt road leading eastward to the top of the mesa in the southeasternmost corner of the property. The site is immediately adjacent (10 meters south) of CA-ORA-1610H, the World War II gun emplacement remnants. The proximity of the two sites has no bearing on their relationship. The deposits occurred at different times (see below), and the remnant concrete portions of the gun emplacement are not in their primary location.

CA-ORA-1602H is approximately 0.4 km east of the West Coast Highway entrance to the West Newport Oil field (Armstrong Oil), also known as Newport Banning Ranch, on the eastern bank of a broad drainage that runs beneath Coast Highway (Appendix C, Exhibit 6). This site lies on the slope of a highly eroded, graded upland flat, which upon surface inspection yielded 49 artifacts associated with the late 19th and early 20th Centuries. In addition to surface inspection, a shovel test pit (n=1) was dug, resulting in 1 positive test and the recovery of 274 historic artifacts.

Subsurface artifacts were encountered at 0–80 cm below the surface. Two dark amber (“black glass”) bottle bases with pontil scars represent the middle to late 19th Century, while the remainder of the assemblage is dominated by ceramic and glass bottle fragments from the early 20th Century. Building materials, including nails, brick fragments and window glass, were recovered. Charcoal, ash, and fire-affected artifacts were present at 60–80 cm, representing a discrete cultural lens within the site. No other area proved to be culturally intact.

Materials recovered include 11 amethyst glass shards, 14 aqua glass shards, 21 amber glass shards, 66 clear glass shards, 2 milk glass shards, 1 cobalt glass shard, 2 green glass shards, 8 olive glass shards, 35 white ware/ironstone sherds, 10 porcelain sherds, 6 salt glazed stoneware sherds, 1 earthenware sherd, 10 mammal bones, 31 miscellaneous building materials, 55 miscellaneous metals, and 1 glass faux pearl hatpin mount.

The age of this site, CA-ORA-1602H, (Late 19th/Early 20th Century) (described above), shares no temporal relationship with CA-ORA-1610H, the Costa Mesa Gun Battery (described below). While the remains of the Battery foundations are within 10 meters, no cultural relationship exists. The location of the site along an open bluff exposure facing south suggests that the exposure may have served as an occasional dump at the turn of the century.

This site does not possess the integrity or distinction to warrant listing in the NRHP or CRHR as a historical resource, nor does it meet the criteria for a unique archaeological resource. No further work is recommended. The testing activities have exhausted the data available from this site.

6.2.3 CA-ORA-1610H

This site was first identified by Van Horn (1982), but was not officially recorded as site CA-ORA-1610H (BR-5) until Smith et al. recorded the site during the Phase I survey activities of Drover and Smith (1999) (see LSA 2008). Based on an actual design plan recovered from the MacArthur Museum, the location was known to have had a "Panama Mount" comprising the "Costa Mesa Battery" (Drover and Smith 1999). These coastal defense batteries were built along the Southern California coast in a variety of locations. Large portions of broken concrete, which had been pushed into an arroyo possibly for erosion control, were assumed to be remnant parts of the original battery and were deemed the location of CA-ORA-1610H. Later observations by LSA (2008:25) positively demonstrated from the plan drawing that an omega-shaped concrete anchor noted on the plan and observed embedded in a concrete fragment verified the anchor as part of the gun mount. A "Panama Mount" normally consisted of three guns; however, Costa Mesa only completed the installation of two. (See Appendix C, Exhibit 6)

LSA provided an excellent summary of the Costa Mesa Battery (see 2008:23–27). The only physical remains of the gunnery emplacement consisted of the broken concrete slabs recognized in the combined survey activities of Drover and Smith (1999) and LSA (2008). The slab fragments, verified as part of the gun emplacement, are clearly not in their original location. Atop the bluff and above the slab fragments is the remnant of a mesa which intuitively would seem to be the location of the gun emplacement. Oilfield drill pads were operated on this bluff, decommissioned, and the soils "cleaned" by surface grading. Mass grading related to road construction has also significantly altered the mesa on both the northern and southern sides of West Coast Highway. While the small remaining portion of the bluff is near its original elevation, no topsoil remains, suggesting the absence of a foot of soil. Areas impacted by mass grading indicate a topographic absence of as much as 15 to 20 feet of soil.

FIGURE 12
COSTA MESA BATTERY; NOTE OMEGA SHAPED CONCRETE ANCHOR
(AFTER LSA 2008)

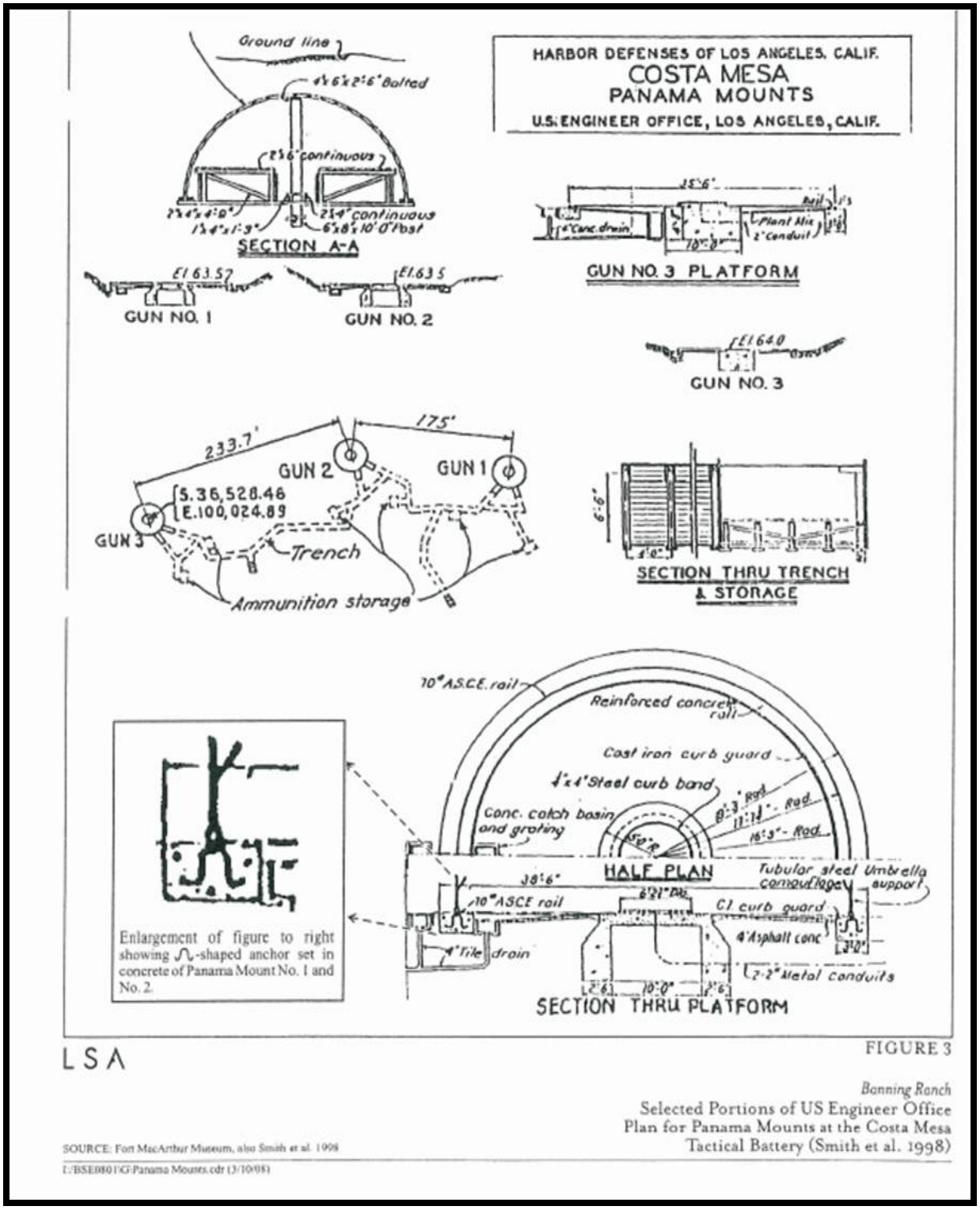
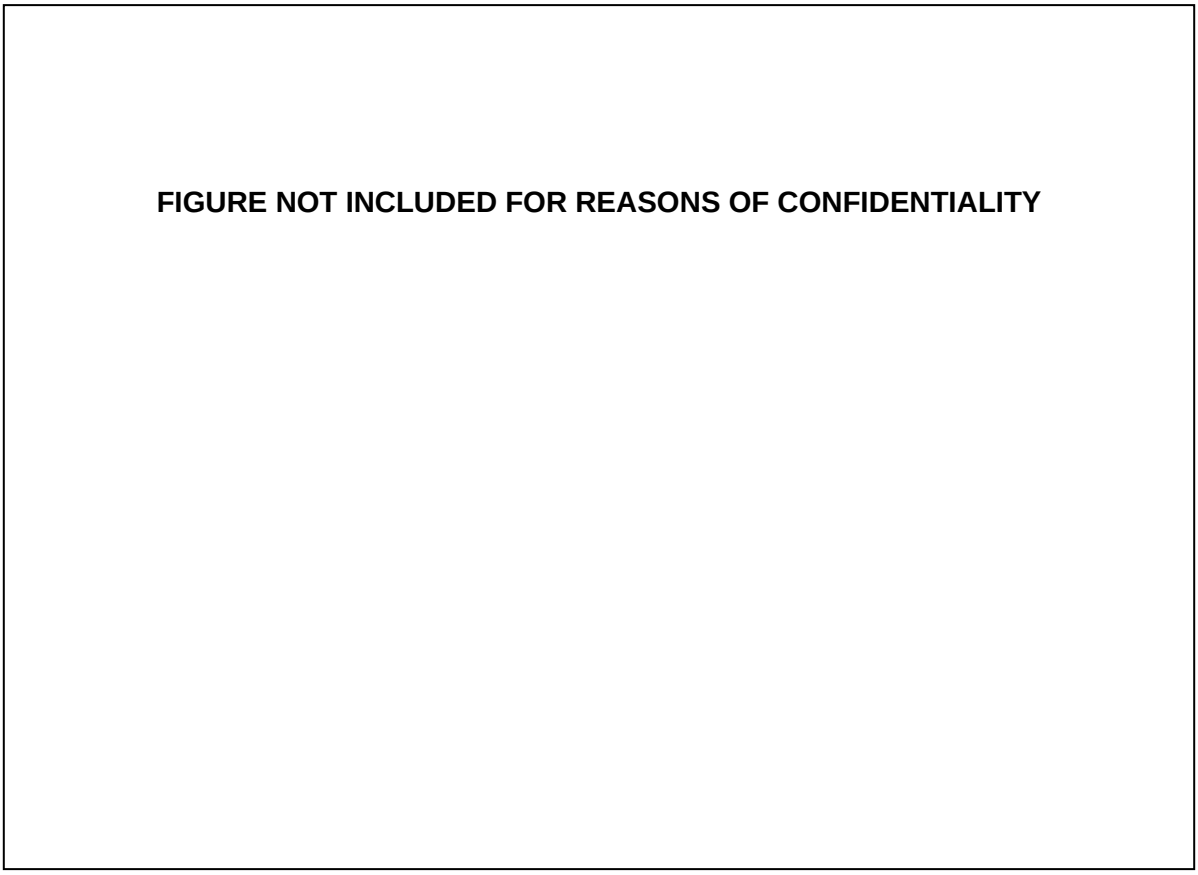


FIGURE 13
ORA-1610; NOTE OMEGA-SHAPED CONCRETE ANCHOR
IN THE CENTER RIGHT



The exact, original location of the gun emplacement is unknown, primarily due to mass grading disturbances related to road construction in the 1960s.

The restricted western view (potential visual shooting range) at the present position of the remnant concrete slabs would not seem to be a suitable location for the emplacement. It is possible that the original location of the gun emplacement would have been closer to West Coast Highway, thereby extending the visual range. Earthmoving disturbances appear to have removed the "front" or ocean front of the bluff, probably destroying the original gun emplacement location as a result.

Drover and Smith (1999) suggested the potential for subsurface data possibly intact in trenches or ammunition storage structures, and recommended monitoring for future development (1999:6). Based on the same possibility, LSA (2008:65) recommended backhoe testing. Given the degree of disturbance to the area, the likelihood of recovering further physical data beyond the fragmentary concrete slabs is unlikely. Monitoring of any grading activities in the area is recommended. The limited likelihood of further physical data and exhaustive archival efforts strongly suggest this physical site has little or no remaining importance. Therefore, this site is not eligible for inclusion on the NRHP or CRHR as a historical resource, nor does it meet the criteria for a unique archaeological resource.

SECTION 7.0 DISCUSSION

The fact that the Newport Banning Ranch Project site is located in this coastal, lagoonal habitat, most of which has been destroyed and developed throughout most of Southern California, and that little to no archaeological investigation has taken place here, creates its own "data gap" in Southern California coastal archaeology. This makes any relevant information gathered as a result of the study that much more important.

7.1 ELIGIBILITY DETERMINATIONS

The goal of the evaluation was to determine the sites' eligibility for listing in the CRHR under the criteria outlined in Section 15064.5 of the CEQA Guidelines (PRC §5024.1), and for listing in the NRHP under Section 106 of the NHPA (36 CFR 60.4). Criterion "D" of both Section 15064.5 of the CEQA Guidelines and 36 CFR 60.4 of the NRHP have been applied to each site during this test, and the conclusions are indicated below. The primary objective of the evaluation was to evaluate whether each site has sufficient integrity, density, and diversity to yield information important to prehistory or history. To demonstrate this, a methodical approach was used to determine the integrity, density, and diversity of data classes within each site. Through a combination of STPs and intuitively positioned Control Units, the investigation resulted in a representative sample with which to empirically measure each site's cultural constituents.

SECTION 8.0 MANAGEMENT CONSIDERATIONS

Of the 11 archaeological sites recorded on the Newport Banning Ranch Project site, BonTerra Consulting recommends that 3 sites (CA-ORA-839, CA-ORA-844B, and CA-ORA-906) be deemed eligible for listing on the CRHR and the NRHP. Therefore, the following recommendations are focused on the three significant sites, with additional mitigation measures that apply to the site as a whole.

Data recovery work at these sites would be designed to collect relevant information on the research domains presented above. In particular, subsistence and settlement questions, food procurement strategies, habitat reconstruction, and change through time should be able to be addressed through data recovery. However, underpinning most of these questions is an assumption of understanding each site chronologically. Little to nothing is now known of the cultural chronology of sites in Newport Banning Ranch. Such data is critical in being able to address other research topics, especially those regarding change through time. Therefore, it is critical that any data recovery excavations include sufficiently robust radiocarbon data at each site to form a baseline that could in turn be compared to nearby sites for which a chronology has been established (e.g., the Newport Coast Archaeological Project).

8.1 RECOMMENDATIONS/MITIGATION

8.1.1 CA-ORA-148

Most of the "soil" on the site actually consists of Qtm or Quaternary Marine Terrace, with grading having disturbed the past top soil or potential cultural deposits (cf. GMU 2080). The terrace has been graded flat as a result of oil field operations. Therefore, it is difficult to determine what depth any original cultural deposit may have had.

The poor to nonexistent physical integrity of this site and resulting lack of cultural data available renders it impossible to provide any of the data requirements to address questions presented in the Research Design section above. Therefore, BonTerra Consulting recommends that CA-ORA-148 be deemed *not eligible* for listing on the CRHR and the NRHP.

8.1.2 CA-ORA-839

Given the topographic location and faunal and lithic material obtained in this sample and by comparison to the results of the Newport Coast Archaeological Project, CA-ORA-839 appears to be a Minor Residential Base (Mason and Peterson 1994:270). To a limited degree male and female activities, food procurement, and food-processing activities all seem to have occurred at the site. While trade items (obsidian) and socio-ideological items (bead) are represented at the site, their limited quantities may reflect a limited duration of occupation. Given the limited regional knowledge of the occupation and habitat of the area, CA-ORA-839 can certainly provide unique chronological, subsistence, and change information about two or possibly three prehistoric cultural periods. Therefore, BonTerra Consulting recommends that CA-ORA-839 be deemed *eligible* for listing on the CRHR and the NRHP.

The following mitigation is recommended.

> The CEQA Guidelines (14 CCR §15126.4[b][3]) direct public agencies, wherever feasible, to avoid damaging historical resources of an archaeological nature, preferably by preserving the resource(s) in place. Several possibilities suggested by the CEQA Guidelines include (1) planning construction to avoid the site; (2) incorporating the site into open space; (3) capping the site with a chemically stable soil; and/or (4) deeding the site into a permanent conservation easement.
>
> The following is applicable for CA-ORA-839 deemed eligible for listing on the CRHR or the NRHP as historical resources. CA-ORA-839 is also considered a unique archaeological resource. Mitigation is the same for both types of resources.
>
> ***CA-ORA-839***
>
> It should be possible to preserve the vast majority of the site in place in perpetuity to avoid further disturbance to it. However, it appears that the planned removal of oil field infrastructure may impact portions of the site. In that event, the site shall undergo a data recovery excavation of those areas that will be impacted. Data recovery shall be sufficient to collect a representative sample of site constituents, including organic materials, to permit additional absolute dating of the deposit.
>
> Data Recovery
>
> Data recovery excavation shall be completed prior to Project grading and shall be designed to recover the consequential data present on the site. The study shall include:
>
> - Development of a Research Design/Treatment And Mitigation Plan to explicitly lay out the methods to be used in the excavation and the scientifically consequential questions that the study will hope to answer;
> - Excavation of a sufficient number of Control Units and shovel test pits (STPs) to recover a representative sample of site constituents;
> - Laboratory analysis of all recovered materials and creation of a computerized database of artifacts recovered;

- Completion of a Data Recovery Excavation/Mitigation Report detailing the results of the study; and

- Curation of excavated cultural material in a museum or other scientifically accredited institution that would make the collections available to future researchers.

Capping

In addition, secondary impacts (e.g., increased foot traffic, erosion) could occur at the site after the Project has been constructed; therefore, the site shall be capped with chemically stable soil to preserve it in perpetuity. During grading operations, excess dirt shall be placed on the site to a sufficient depth to protect the deposit, but not cause unintended damage to it. Shallow-rooted vegetation (such as native coastal sage scrub) may be planted on the new surface. To ensure the integrity of the archaeological deposit, the current ground surface shall initially be covered with some form of horizon marker (e.g., by *Mirafi,* a polypropylene geotextile) to prevent the deposit from mixing with the covering material and to serve as a marker of the site if the covering is ever removed. The following relies on guidance provided by the National Park Service's Brief #5 *Intentional Site Burial: A Technique to Protect Against Natural or Mechanical Loss* (NPS 1989, revised 1991).

The capping program must include submittal to the City of Newport Beach Planning Department of a Site Capping Plan that includes:

- An evaluation by a qualified Archaeologist of the classes of archaeological components to be preserved and their suitability for preservation;

- An analysis by a qualified Soils Scientist of the pH levels, compression strength, and permeability of the horizon marker and capping material to be used to ensure they fit the preservation needs of the site's constituents;

- Formulation of a plan by a qualified Civil/Structural Engineer that details how the cap will be physically constructed to ensure that (1) hydraulic changes over time, (2) erosion, and (3) the physical placement of the cap itself do not adversely impact the deposit;

- Archaeological monitoring during placement of the capping material;

- A Revegetation Plan, prepared by a qualified Biologist/Restoration Specialist, that is designed to help stabilize the new land surface and to prevent future erosion at the surface of the cap;

- A plan of future monitoring of the site to ensure the long-term success of the capping program; and

- A report detailing the results of the capping effort.

8.1.3 CA-ORA-843

At one time this site was probably quite large and located on a prominent point on the bluff overlooking the wetland. Due to the degree to which the site has been impacted by grading and

oil field activities, the exact location and integrity of the site has been difficult to ascertain. Evaluation of the site produced limited cultural material. The small area that produced these few specimens was highly disturbed by grading, intrusive phone poles, trash, and erosion. Based on the present observations it is difficult to understand Van Horn's estimation of the site's "significance". It is clear that CA-ORA-843 lacks any vertical or horizontal integrity or representative data to address relevant research questions. Therefore, BonTerra Consulting recommends that CA-ORA-843 be deemed *not eligible* for listing on the CRHR and the NRHP as a historical and/or unique resource.

8.1.4 CA-ORA-844

Excavation at Locus A failed to produce a substantial deposit. It appears that its integrity has been destroyed. Therefore, the ability of Locus A to address the proposed research questions is highly doubtful; however, since it is recommended that Locus B qualifies in its ability to fulfill eligibility (see below), a Control Unit excavated at Locus A may provide an adequate radiocarbon sample to determine the contemporanaeity of Loci A and B.

The three STPs and one Control Unit excavated at Locus B produced shell, lithics and animal bone, with shell being the most plentiful. The diversity of species in such a small sample is also promising in the reconstruction of the habitat and food-procurement strategies. The shell density and species frequency is favorable to the Minor Residential Base pattern suggested by Mason and Peterson (994:270).

The remaining portion of the site has the capability to at least address the temporal setting of the site and its subsistence patterns. It is possible that other recovered data classes may contribute to other questions proposed in the research design. Therefore, BonTerra Consulting recommends that CA-ORA-844, Locus B be deemed *eligible* for listing on the CRHR and the NRHP.

Locus B of the site is located on a hillside transected by two erosional cuts in excess of six feet in depth. The western side of the site is absent due to the construction of an oil pad. These factors have left little midden from the original site intact at this location, but a surprisingly robust sample was recovered through the test excavation.

The following mitigation is recommended.

> The CEQA Guidelines (14 CCR §15126.4[b][3]) direct public agencies, wherever feasible, to avoid damaging historical resources of an archaeological nature, preferably by preserving the resource(s) in place. Several possibilities suggested by the CEQA Guidelines include (1) planning construction to avoid the site; (2) incorporating the site into open space; (3) capping the site with a chemically stable soil; and/or (4) deeding the site into a permanent conservation easement.
>
> The following is applicable for CA-ORA-844, Locuse B, deemed eligible for listing on the CRHR or the NRHP as historical resources.
>
> ***CA-ORA-844 Locus B***
>
> CA-ORA-844B is not expected to be directly impacted by development. Oil infrastructure removal activities that would occur prior to grading are expected to adversely impact portions of the site. Indirect impacts from additional erosion of the unstable surface and increased population in the vicinity of the site as a result of the future development could cause further damage over time.

Both capping and data recovery excavation are viable options for treating the site; however, because it has been disturbed by erosion and oil extraction activities, capping the deposit would be difficult and possibly more expensive and time consuming with less desirable results, than data recovery excavation. Considering these circumstances, two options are provided: (1) successful capping of the site, while likely difficult to accomplish, would be designed to protect the site in perpetuity or, preferably, (2) data recovery shall be undertaken prior to grading to collect the scientifically consequential data that is present in the site since it appears that only a small, yet important, portion of the site remains. Because of the limited size of this site, this option would be able to remove and analyze the site in its entirety.

Capping

If option 1 is chosen, the site shall be capped with chemically stable soil to preserve it in perpetuity. During grading operations, excess dirt shall be placed on the site to a sufficient depth to protect the deposit, but not cause unintended damage to it. Shallow-rooted vegetation (such as native coastal sage scrub) may be planted on the new surface. To ensure the integrity of the archaeological deposit, the current ground surface shall initially be covered with some form of horizon marker (e.g., by *Mirafi,* a polypropylene geotextile) to prevent the deposit from mixing with the covering material and to serve as a marker of the site if the covering is ever removed. The following relies on guidance provided by the National Park Service's Brief #5 *Intentional Site Burial: A Technique to Protect Against Natural or Mechanical Loss* (NPS 1989, revised 1991).

The capping program must include submittal to the Community Development Department of a Site Capping Plan that includes:

- An evaluation by a qualified Archaeologist of the classes of archaeological components to be preserved and their suitability for preservation;

- An analysis by a qualified Soils Scientist of the pH levels, compression strength, and permeability of the horizon marker and capping material to be used to ensure they fit the preservation needs of the site's constituents;

- Formulation of a plan by a qualified Civil/Structural Engineer that details how the cap would be physically constructed to ensure that (1) hydraulic changes over time, (2) erosion, and (3) the physical placement of the cap itself do not adversely impact the deposit;

- Archaeological monitoring during placement of the capping material;

- A Revegetation Plan, prepared by a qualified Biologist/Restoration Specialist, that is designed to help stabilize the new land surface and to prevent future erosion at the cap surface;

- A plan of future monitoring of the site to ensure the long-term success of the capping program; and

- A report detailing the results of the capping effort.

Data Recovery

If option 2 is selected, data recovery excavation at CA-ORA-844B shall be completed prior to Project grading and shall be designed to recover the consequential data present in the site and to remove site constituents. The study shall include:

- Development of a Research Design/Treatment And Mitigation Plan to explicitly lay out the methods to be used in the excavation and the scientifically consequential questions that the study will hope to answer;
- Excavation of a sufficient number of Control Units and STPs to recover a representative sample of site constituents;
- Controlled demolition/removal of the site by a small scraper under the direction of a qualified Archaeologist to ensure the removal of all midden and other cultural constituents of the site. Controlled demolition permits the discovery and recovery of larger features not typically found during hand excavation and reduces the number of hand-excavated control units necessary;
- Laboratory analysis of all recovered materials and creation of a computerized database of artifacts recovered;
- Completion of a Data Recovery Excavation/Mitigation Report detailing the results of the study; and
- Curation of excavated cultural material in a museum or other scientifically accredited institution that would make the collections available to future researchers.

8.1.5 CA-ORA-845

Ten STPs were excavated at CA-ORA-845. Only a minimal amount of material was recovered. The deepest STP went from 4 to 60 cm. The total NRE for shell recovered from all of the 8 lower STPs was 25 (8 *Chione californiensis*, 12 *Ostrea lurida*, and 5 *Chione* spp.). No other cultural material was recovered. Due to the impact to this area, our findings are in agreement with Van Horn (1982) that the site no longer exists and lacks any physical integrity. Van Horn's results stated that "…no significant deposit is present at this site" (1982:29). Therefore, BonTerra Consulting recommends that CA-ORA-845 be deemed *not eligible* for listing on the CRHR and the NRHP as a historical and/or unique resource.

8.1.6 CA-ORA-906

Regardless of the partial destruction of this site from road building and the difficulty of access given the land slide overlay, the site represents a third chronological period on the property, the Late Prehistoric. The data from this site could easily contribute to the research design categories of chronology and subsistence and settlement patterns. Again, little is known about the prehistoric use of the mouth of the Santa Ana River and its estuary. The lack of any lithics or diagnostic fire-affected rock is also unusual given the shellfish density of the midden that approaches that of a Major Residential site (Mason and Peterson 1994:270). Therefore, BonTerra Consulting recommends that CA-ORA-906 be deemed *eligible* for listing on the CRHR and the NRHP.

The following mitigation is recommended.

> The CEQA Guidelines (14 CCR §15126.4[b][3]) direct public agencies, wherever feasible, to avoid damaging historical resources of an archaeological nature, preferably by preserving the resource(s) in place. Several possibilities suggested by the CEQA Guidelines include (1) planning construction to avoid the site; (2) incorporating the site into open space; (3) capping the site with a chemically stable soil; and/or (4) deeding the site into a permanent conservation easement.
>
> The following is applicable for CA-ORA-906 deemed eligible for listing on the CRHR or the NRHP as historical resources.
>
> ***CA-ORA-906***
>
> CA-ORA-906 shall be directly impacted as a result of development as well as oil infrastructure removal. Data recovery excavation at the site shall be completed prior to Project grading and shall be designed to recover the consequential data present in the site and to remove the site constituents. Mitigation shall be in the form of data recovery excavation to collect the scientifically consequential data that the site retains prior to its destruction by Project grading. The study shall include:
>
> - Development of a Research Design/Treatment And Mitigation Plan to explicitly lay out the methods to be used in the excavation and the scientifically consequential questions that the study will hope to answer;
>
> - Excavation of a sufficient number of Control Units and STPs to recover a representative sample of site constituents;
>
> - Controlled demolition/removal of the site by a small scraper under the direction of a qualified Archaeologist to ensure the removal of all midden and other cultural constituents of the site. Controlled demolition permits the discovery and recovery of larger features not typically found during hand excavation and reduces the number of hand-excavated control units necessary;
>
> - Laboratory analysis of all recovered materials and creation of a computerized database of artifacts recovered;
>
> - Completion of a data recovery excavation/mitigation report detailing the results of the study; and
>
> - Curation of excavated cultural material in a museum or other scientifically accredited institution that would make the collections available to future researchers.

8.1.7 CA-ORA-1599

The lack of cultural material, evidence of mixing with historic material, and obvious appearance of topographic disturbance leaves little to no value in these specimens.

The poor physical integrity of this site and resulting lack of cultural data renders it impossible to provide any of the data requirements to address questions presented in the Research Design

section above. Therefore, BonTerra Consulting recommends that CA-ORA-1599 be deemed *not eligible* for listing on the CRHR and the NRHP as a historical and/or unique resource.

8.1.8 CA-ORA-1600

All of the STPs excavated in the mapped location of this site returned negative cultural material. The lack of cultural material, evidence of surface historic material, and obvious appearance of topographic disturbance leaves little to no value in these specimens.

The poor physical integrity of this site and resulting lack of cultural data renders it impossible to provide any of the data requirements to address questions presented in the Research Design section above. Therefore, BonTerra Consulting recommends that CA-ORA-1600 be deemed *not eligible* for listing on the CRHR and the NRHP as a historical and/or unique resource.

8.1.9 CA-ORA-1601H

The location of the site along an open bluff exposure facing south suggests that the exposure may have served as an occasional dump at the turn of the century.

This site does not possess the integrity or distinction to warrant listing in the NRHP. No further work is recommended. The testing activities exhausted the data available from this site. Therefore, BonTerra Consulting recommends that CA-ORA-1601H be deemed *not eligible* for listing on the CRHR and the NRHP as a historical and/or unique resource.

8.1.10 CA-ORA-1602H

The location of the site along an open bluff exposure facing south suggests that the exposure may have served as an occasional dump at the turn of the century.

This site does not possess the integrity or distinction to warrant listing in the NRHP. No further work is recommended. The testing activities exhausted the data available from this site. Therefore, BonTerra Consulting recommends that CA-ORA-1602H be deemed *not eligible* for listing on the CRHR and the NRHP as a historical and/or unique resource.

8.1.11 CA-ORA-1610H

The exact, original location of the gun emplacement is unknown, primarily due to mass grading disturbances related to road construction in the 1960s. Drover and Smith in 1999 suggested the potential for subsurface data possibly intact in trenches or ammunition storage structures, and recommended monitoring for future development (1999:6). Based on the same possibility, LSA (2008:65) recommended backhoe testing. Given the degree of disturbance to the area, the likelihood of recovering further physical data beyond the fragmentary concrete slabs is unlikely. Monitoring of any grading activities in the area is recommended. The limited likelihood of further physical data in addition to exhaustive archival efforts strongly suggests this site has little important data remaining. Therefore, BonTerra Consulting recommends that CA-ORA-1610H be deemed *not eligible* for listing on the CRHR and the NRHP as a historical and/or unique resource.

8.2 CULTURAL RESOURCES MONITORING

The following mitigation is recommended.

> Prior to the issuance of the first grading permit and/or action that would permit Project site disturbance, the Contractor shall provide written evidence to the City

of Newport Beach Planning Department that the Contractor has retained a qualified Archaeologist to observe grading activities and to salvage and catalogue archaeological resources, as necessary. The Archaeologist shall be present at the pre-grade conference; shall establish procedures for archaeological resource surveillance; and shall establish, in cooperation with the Contractor, procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the artifacts, as appropriate. If archaeological resources are found to be significant, the Archaeologist shall determine appropriate actions, in cooperation with the City and Contractor, for exploration and/or salvage. These actions, as well as final mitigation and disposition of the resources, shall be subject to the approval of the Planning Director.

Based on their interest and concern about the discovery of cultural resources and human remains during Project grading, a Native American Monitor shall be retained to observe some or all grading activities.

Nothing in this mitigation measure precludes the retention of a single cross-trained observer who is qualified to monitor for both archaeological and paleontological resources.

8.3 HUMAN REMAINS

The following mitigation is required.

In accordance with Section 7050.5 of the *California Health and Safety Code*, if human remains are found, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are or believed to be Native American, s/he shall notify the NAHC in Sacramento within 24 hours. In accordance with Section 5097.98 of the *California Public Resources Code,* the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendents shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

With implementation of the mitigation program listed above, potential impacts to archaeological resources would be reduced to a level considered less than significant.

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APPENDIX A

PERSONNEL QUALIFICATIONS

Christopher E. Drover Ph.D.

Registered Professional Archaeologist

Education

Doctor of Philosophy, Anthropology, University of California, Riverside, CA, 1979 (Ph.D. Dissertation: Late Prehistoric Human Ecology of the Northern Mohave Sink, San Bernardino County, CA)

Master of Arts, Anthropology, California State University, Fullerton, CA, 1972

Bachelor of Arts, Anthropology, California State University, Fullerton, CA, 1970

Specialized Training

NAHC Compliance Course

ACHP Section 106 Essentials Training

Riverside County Cultural Sensitivity Training, 2007

Areas of Expertise

Management Archaeology and Paleontology

CEQA and Section 106 Projects

Survey, Data Recovery and Monitoring

California, Great Basin, Southwest

Professional Summary

Christopher E. Drover, Ph.D., RPA offers over 30 years of experience in conducting cultural resources assessments for environmental impact statements. He graduated from the University of California, Riverside in Anthropology-Archaeology in 1979, has been a tenured professor of this discipline at Golden West College in Huntington Beach since 1973, and is a visiting professor of anthropology at the University of California, Irvine. As a Principal Investigator, he has published extensive research regarding the archaeology of San Bernardino, Riverside, and Orange Counties. Dr. Drover has conducted numerous consulting projects in the California Counties of Riverside, San Diego, Los Angeles, San Bernardino, Kern, Ventura, and Inyo; in the states of Arizona, Nevada, and Alaska; and internationally in Mexico and Argentina. Some of the clients he has provided evaluations for over the years include the Museum of Northern Arizona; the Kaiser Corporation; St. Joe America Corporation; Fluor Corporation; Kinder Morgan; the Department of Defense; the Bureau of Reclamation; the Bureau of Indian Affairs; the U.S. Army Corps of Engineers (USACE); the State Lands Commission; U.S. Forest Service (USFS); Arco; Chevron; and the Texaco Oil Corporation.

Representative Experience

Nellis Air Force Base. Dr. Drover was the principal investigator responsible for overseeing the production of The Dry Lake Hydrological Disturbance Evaluation Model. A New Method for Assessing Archaeological Integrity in Dry Lake Environments at Nellis Air Force Base, Nevada. Prepared for Nellis Air Force Base.

Caltrans. Dr. Drover was the principle investigator responsible for overseeing the survey and report preparation Archaeological Survey Report. Harbor Boulevard North Off-Ramp Project. Costa Mesa, California. Submitted to Caltrans District 12.

Flagstaff, Arizona. Dr. Drover was the principle investigator responsible for overseeing the survey and report preparation of the Archaeological Survey of the Presidio West Development,

Flagstaff, Arizona. Arizona Antiquities Act Blanket Permit No. 2005-075bl. Manuscript on File at the Arizona State Museum.

Tucson, Arizona. Dr. Drover was the principle investigator responsible for overseeing the survey and report preparation of the Transwestern Pipeline Anomaly and SCC Repair Dig Sites, Pinal County, Arizona. Arizona Antiquities Act Blanket Permit No. 2005-075bl Kinder Morgan. Manuscript on File at the Arizona State Museum.

Fort Bragg. Dr. Drover was the principle Investigator for the decommissioning of a 460-acre lumber mill in Fort Bragg, California. This facility was the third largest redwood mill in the world and was a former Native American reservation. Dr. Drover was responsible for historic and prehistoric evaluation of the resources on the site.

Newport Coast Community Park, Newport Coast. Dr. Drover was the archaeologist responsible for overseeing the grading monitoring services for the Newport Coast Community Park, located in Newport Beach, California. The archaeological and paleontological aspects of this area have been determined as sensitive and relatively high and will require monitoring of active cuts during the grading process. In addition to providing this service, the scope of work for this project encompassed the review of excavation and construction plans; coordination of responsibilities with project contractors; development of a safety plan for the monitoring of grading operations; observation and evaluation of the salvage to identify any cultural resources uncovered by grading or trenching; shovel probing to determine whether a discovery is isolated or part of a potential site; coordination of the transfer of any collected archaeological resources; and the preparation of a full report on the archaeological program with the discoveries described and interpreted for the City.

Bonita Mesa Paleontological Excavation (Planning Area 26), Irvine. Dr. Drover was the archaeologist responsible for overseeing the excavation of the largest fossil whale bed found on the continental United States. The recovery required 10,000 lbs of plaster of paris and 1,000 yards of burlap to remove the fossils from the site. The Keith Companies excavated the site in approximately six weeks, all the while maintaining a large field crew at the Bonita Mesa archaeological project located in the county of Orange, California. Dr. Drover followed CEQA guidelines as well as working with local Native American on site consultation.

Paseo Del Sol, Temecula. Dr. Drover was the archaeologist responsible for overseeing the archaeology, paleontology, and grading monitoring for this 829-acre project located in Temecula, California. There were five archaeological sites mitigated during the early phase of work. Three of the sites were prehistoric, while the other two were early Pala Valley historic adobe sites. Excavations included systematic data recovery, testing, and the complete excavation of a three-room adobe. The Pala Formation, rich in pleistocene mammal fossils, formed the geologic base of the property. The Keith Companies' archaeologists and paleontologists were active throughout the initial pre-grading and mass-grading phases on the site. Also at the site were found five Mastodons; they were excavated and prepared for analysis. There were numerous other specimens of extinct animals found as well, including a saber-toothed cat claw. In addition, the archaeological and paleontological sensitivity of this area was high and required the active monitoring of active cuts. Dr. Drover worked through consultation and assistance with local Native Americans, as well pursuant to CEQA guidelines.

Planning Area 18, Irvine. Dr. Drover was the archaeologist responsible for overseeing the archaeology for this 800-acre Planning Area 18 located in Irvine, California. The Keith Companies did a Phase I Cultural Resources Inventory including paleontology. Two prehistoric

sites were re-recorded, while two new sites were discovered and recorded. No paleontological areas were found but a report for paleo-sensitivity was generated. All work was pursuant to CEQA guidelines.

Planning Area 5A – 9C EIR Feasibility, Irvine. Dr. Drover was the archaeologist responsible for overseeing the archaeological services for Planning Area 5A through 9C located in Irvine, California. Phase I work was done on sites 5, 6, 8, and 9. The Keith Companies found 22 sites, 12 of which were previously recorded. One site, Lambert Reservoir, had been tested for advanced preliminary land use. CEQA guidelines were followed.

Planning Area 17 & 18 – Cultural Resources, Irvine. Dr. Drover was the archaeologist responsible for overseeing the Phase I cultural resource inventory, survey, and record search for an 1,800-acre site located in the city of Irvine. The property yielded eleven sites found to be prehistoric. Seven of these sites were re-recorded and four of them newly recorded. Dr. Drover recommended a Phase II test/excavation to eliminate problems further down the line in the development process. All work conducted pursuant to CEQA guidelines.

Shady Canyon Archaeology, Irvine. Dr. Drover was the archaeologist responsible for overseeing the Phase II archaeological testing and excavation for a 1,046-acre residential project located in Irvine, California. Twenty sites studied to see whether or not these archaeological sites were deemed significant enough to alter the communities' design. One site was determined to not be an archaeological site. Of the remaining 19, seven were preserved in entirety through the cooperative land planning, and 12 were fully excavated. All work was done pursuant to CEQA requirements. Dr. Drover worked closely with local Native Americans on the project.

Trilogy at Glen Ivy, Corona. Dr. Drover was the archaeologist responsible for overseeing the archaeological services for Trilogy, a 820-acre senior residential community with golf course located in Corona, California. Dr. Drover's scope of services included reviewing archaeological and paleontological literature; performing archaeological and paleontological field work; and preparing archaeological and paleontological reports.

The Retreat at The Quarry – Cultural Resources, La Quinta. Dr. Drover was the archaeologist responsible for overseeing the cultural resources survey for this mixed-use, residential/commercial development. The seven-acre site, located in La Quinta, underwent Phase I environmental assessment and cultural resource monitoring during the grading process. TKC was pursuant to CEQA guidelines.

PROFESSIONAL EXPERIENCE

1995–ongoing, University of California, Irvine, Visiting Professor
1973–ongoing, Golden West College, California, full-time, tenured, professor
2003–2007 Director of Archaeology TRC
1997–2003 Director of Archaeology TKC, Keith Companies
1984–1986, University of California, Irvine, Visiting Professor
1985–1989, Director of Archaeology, Chambers Consultants and Planners
1975, University of California, Riverside, Lecturer
1973, Chapman College, Orange, Instructor, part-time
1973, Santa Ana College, Santa Ana, Instructor, part-time
1973, University of California, Irvine, Instructor, extension
1971–1972, California State University, Fullerton, Instructor, part-time
1970–ongoing Archaeological Consultant

Patrick O. Maxon, RPA
Director, Cultural Resources

Education

- M.A. Anthropology
  California State University, Fullerton, 1994
- B.A. Psychology/ Sociology
  Towson State University, Maryland, 1987

Professional Certifications

- Registered Professional Archaeologist (National), 1999
- Certified Archaeologist – Riverside County TLMA, 2008-2009
- Cultural Resources Specialist – California Energy Commission, 2004
- Certified Archaeologist – Orange County Environmental Management Agency, 1998

Professional Summary

Patrick Maxon has 15 years of experience in cultural resources management. A Registered Professional Archaeologist, he has expertise in compliance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), and the Clean Water Act, among others. Mr. Maxon has been certified as an archaeologist by the City of San Diego, and is also certified by the County of Orange Environmental Management Agency and the Riverside County Transportation and Land Management Agency. Mr. Maxon has completed hundreds of cultural resource projects that have involved agency, client, Native American, and subcontractor coordination; treatment plans and research design development; archival research; field reconnaissance; site testing; data recovery excavation; construction monitoring; site recordation; site protection/preservation; mapping/cartography; laboratory analysis; and report production. He has managed a number of projects within the jurisdiction of the U.S. Army Corps of Engineers (USACE), the Bureau of Land Management (BLM), the Bureau of Reclamation, and other federal agencies that require compliance with Section 106 of the NHPA. He has also completed projects throughout Southern California under CEQA for State and local governments and municipalities.

Representative Project Experience

Centennial Corridor Environmental Impact Report, Cultural Resources Surveys, Kern County. BonTerra Consulting is preparing the environmental documentation for the Centennial Corridor, Thomas Roads Improvement Project, in the City of Bakersfield. Mr. Maxon is managing the review, evaluation and mitigation of cultural resources for the project. He conducted background research, coordinated with Caltrans and other agency personnel, accomplished a field survey of the Area of Potential Effects, including several alternatives, and is currently analyzing and documenting the results of the survey.

Centennial New Town Environmental Impact Report, Cultural and Biological Resources Surveys, Los Angeles County. BonTerra Consulting is preparing the environmental documentation for the Centennial New Town that involves a new community consisting of residential, commercial, business park, and cultural and civic/institutional uses and encompassing approximately 11,680 acres. Mr. Maxon is managing the review, evaluation and mitigation of cultural resources for the project. To consider the current status of the project

area's cultural and paleontological resources in the environmental analysis, the entire ~12,000 acre project area, as well as small offsite areas, initially underwent a Phase I cultural resources study including a records search at the South Central Coastal Information Center, California State University, Fullerton, a paleontological records search at the Los Angeles County Museum and an intensive pedestrian survey to evaluate the project area for the presence of cultural and paleontological resources. Numerous cultural resources sites were discovered, some were evaluated for significance. Those that were determined eligible and were in the development area were preserved in place. As the project evolves and expands beyond the Phase One area, additional sites must be evaluated for significance, some may need to undergo data recovery excavations, while one structure must be recorded and evaluated; consultations with regulatory agencies, County staff, Native American tribes, the interested public, and clients must be completed and their comments considered; and monitoring of disturbances around the known sites will be undertaken when construction activities commence.

Archaeological and Paleontological Investigations, Talega Associates, San Clemente, Orange County. Mr. Maxon was the Project Manager for the archaeological and paleontological compliance monitoring of the Talega Development in Orange County. He was responsible for coordinating this decade-long project with the USACE by ensuring compliance with Section 106 of the NHPA; performing monitoring; evaluating archaeological sites according to the NHPA and CEQA; completing data recovery excavations; completing laboratory work; and preparing reports. Mr. Maxon managed the excavation of one large archaeological site (CA-LAN-907A and B) and several smaller sites during the course of this project. Mr. Maxon was also involved in the development and installation of a display of artifacts and fossils at the Talega school site.

Cultural Resources Surveys, Union Pacific Railroad Double-Track Project, Thermal, CA to Yuma, AZ. Mr. Maxon was the Cultural Resources Project Manager for the UPRR Double-Track project from Thermal to Yuma. The project began by consulting and coordinating with the State Historic Preservation Officer (SHPO); the Union Pacific Railroad; and other relevant agencies to develop a Programmatic Memorandum of Agreement to consider the cultural resources associated with the project. Mr. Maxon and his crew conducted an intensive, 100 percent-pedestrian, cultural resources survey of the area of potential effect (APE). Initial Native American consultation and bridge and culvert recordation were provided. There are hundreds of structures (bridges and culverts) in the project area, most built between 1903 and 1960 and are considered historic. An Architectural Historian, under Mr. Maxon's direction, visited each structure and produced a Primary Record (DPR 523A) and a Location Map (DPR523J).

Riverside Energy Resource Center Archaeological, Paleontological, and Biological Services, Riverside County. Mr. Maxon served as the Program Director for the archaeological, paleontological, and biological services at the Riverside Energy Resource Center. He managed all aspects of surveys and monitoring of the power plant site and its associated transmission lines and pipelines. Mr. Maxon maintained client contacts; coordinated with the CEC; and communicated with the Riverside public utilities. In addition, he conducted cultural resources surveys and monitoring; completed the cultural resources survey report; and wrote monthly cultural resources monitoring reports and a final project report.

Orange County Great Park, Irvine. Mr. Maxon was the Cultural Resources Manager for the CEQA Professional Program Management, Regulatory Approval/Permitting, Paleontology Discoveries, Cultural and Natural Resource Management Services in Irvine. He provided expertise in the area of cultural resources conservation, which included developing all required monitoring and mitigation plans. He also reviewed the proposed *Orange County Great Park*

Master Plan to determine environmental and engineering constraints related to cultural resources. Once a formidable military base in Orange County, the former Marine Corps Air Station El Toro will be transformed into the 1,347-acre Orange County Great Park.

Saddleback Meadows Development Archaeological Test Excavations, Orange County. Mr. Maxon was the Program Director of archaeological investigations for the Saddleback Meadows Development Project over a period of ten years. He performed test excavations of twelve archaeological sites and developed a treatment plan and research design in compliance with Section 106 of the NHPA for two of the sites. Mr. Maxon conducted a data recovery excavation of one site, and laboratory and report preparation. Additionally, he later developed a testing plan to evaluate two additional prehistoric sites; managed their excavation; and maintained budgets and relations with the client (TPG Management) and the USACE.

Dayton Canyon Estates Development Archaeological Data Recovery, Los Angeles County. Mr. Maxon was the Project Manager for the Dayton Canyon Estates Development Project data recovery excavation of CA-LAN-254. He was responsible for coordinating with the USACE and the Los Angeles County Coroner regarding (1) compliance with Section 106 of the NHPA; (2) the development of a treatment plan and research design; (3) the conducting of data recovery excavations; (4) the recovery of human remains; (5) the performance of laboratory analysis; and (6) assistance with report preparation.

PROFESSIONAL PRESENTATION

"The Circle of Life in Dayton Canyon: Excavations at CA-LAN-254, Los Angeles County, California." 68th Annual Meeting of the Society for American Archaeology. Milwaukee, Wisconsin 2003.

PROFESSIONAL EXPERIENCE

- BonTerra Consulting – 2008
- Chambers Group – 2006 to 2008
- SWCA – 2001 to 2006
- RMW Paleo Associates – 1994 to 2001

PROFESSIONAL MEMBERSHIPS

- Pacific Coast Archaeological Society
- Society for California Archaeology
- Society for American Archaeology
- American Cultural Resources Association
- Association of Environmental Professionals (Board of Directors, 2005-present)

Resume of

MARK A. ROEDER, B.A.

Paleontologist

EXPERIENCE SUMMARY

Extensive paleontologic resource management experience conducting and managing paleontologic resource/impact assessments and impact mitigation programs for large construction projects in California. Projects include municipal solid waste landfills; aggregate quarries; flood control facilities; oil refineries; natural gas pipelines; freeways and other roadways; subways; waste water treatment facilities; housing developments; planned communities; office buildings/complexes; shopping centers; hospitals and medical centers; industrial complexes; parking lots/structures; land exchanges; and conditional use permit and specific plan revisions. Clients include private industry, public utilities, conservancies, and federal, state, county, city, and regional agencies. Paleontologic resource assessments entailed data searches (literature reviews, archival searches, field surveys, consultation with other paleontologists) to develop baseline inventories, evaluation of scientific importance of resources and potential for disturbance by adverse project-related impacts, and formulation of mitigation measures to reduce these impacts to an acceptable level. Paleontologic resource impact mitigation programs required monitoring of earth-moving activities, recovery of fossil remains, supervision of field personnel, and preparation of progress and final reports. Projects involved extensive coordination and consultation with project proponents, other consulting firms, and permitting agencies; adherence to strict delivery schedules; and completion within specified budget limits. Approximately 28 years of experience as a paleontologist and paleontologic consultant involved in NEPA and CEQA compliance. Extensive paleontologic research background in fish faunas of Cenozoic marine and lacustrine formations of southern California. Research entailed literature reviews, archival searches, field surveys, and consultation with other paleontologists.

EXPERIENCE RECORD

2006-to date	TRC, Inc., Irvine, California. Field Supervisor. Participated in paleontologic resource assessments for major construction projects in Orange, Kern and Los Angeles Counties.
2006-to date	SWCA, Inc., Mission Viejo, California. Field Supervisor. Participated in a paleontologic resource assessment for major construction project in Kern County. Supervised paleological resource impact mitigation programs for projects in Los Angeles and Orange Counties.
2005-to date	Chambers Group, Inc., Irvine, California. Field Supervisor. Participated in paleontologic resource assessments for major construction projects in Orange, Riverside, and San Bernardino Counties. Supervised paleological resource impact mitigation programs for County of Orange Integrated Waste Management, SunCal Homes, and other clients.
1997-to date	L & L Environmental, Inc., Corona, California. Field Supervisor. Participated in paleontologic resource assessments for major construction projects in Riverside and San Bernardino Counties. Supervised paleontologic resource impact mitigation programs for Empire Homes, Forecast Homes, Lennar Homes, Pulte Homes, and Inland Empire Utilities Agency. Recently (2005) participated in Riverside County Lamb Canyon Landfill Expansion Study.
1988-to date	Paleo Environmental Associates, Inc., Costa Mesa, California. Field Supervisor/Owner. Participated in paleontologic resource assessments for major construction projects in southern and central California. Supervised paleontologic resource impact mitigation programs for major construction projects in southern California, including Simi Valley, Puente Hills, Santiago Canyon, and Brea/Olinda, Prima Deschecha and Coyote Canyon Landfills, Metro Rail Red Line Segments 1, 2, and 3, Foothill Ranch.
1988	Heritage Resource Consultants, La Mirada, California. Paleontologic Consultant. Participated in paleontologic resource impact assessments for major construction projects in Riverside County, California.
1987-1988	Engineering-Science, Inc., Pasadena, California. Paleontologist. Supervised paleontologic resource impact mitigation program for Simi Valley Landfill expansion in Ventura County, California.
1985-1986	Archaeological Advisory Group, Newport Beach, California. Paleontologic Consultant. Managed paleontologic resource impact mitigation program for Coyote Canyon Landfill in Orange County, California.
1982-1987	San Bernardino County Museum, Redlands, California. Museum Assistant/Technician. Participated in paleontologic resource assessments and impact mitigation programs for major construction projects in southern California.
1983-to date	Paleontological Services, Inc., (San Diego Natural History Museum) San Diego, California. Paleontologic Consultant. Participated in paleontologic resource assessments and impact mitigation programs for major construction projects in San Diego County, California.
1978-1983	Scientific Resource Surveys, Inc., Huntington Beach, California. Paleontologist. Conducted paleontologic resource assessments and impact mitigation programs for major construction projects in Los Angeles, Orange, San Bernardino, and San Diego Counties, California.
1969-1976	Natural History Museum of Los Angeles County, Los Angeles, California. Student Professional Worker/Field Associate.

EDUCATION

B.A., Anthropology, 1977, San Diego State University

PROFESSIONAL REGISTRATION

Registered Paleontologic Consultant, County of Orange, California

PROFESSIONAL SOCIETIES

Society of Vertebrate Paleontology

Western Association of Vertebrate Paleontologists

Southern California Academy of Sciences

INSTITUTIONAL AFFILIATIONS

Field Associate, Natural History Museum of Los Angeles County

PUBLICATIONS

Roeder, M.A., 1978, Fish remains from Ven-294, in Clewlow, C.W., Jr., Wells, H.F., and Pastron, A.G., editors, The archaeology of Oak Park, Ventura County, California: University of California, Los Angeles, Institute of Archaeology Monograph 5(2).

———, 1979, Fish remains, primarily centra, from an inland Chumash site (Ven-261), in Prichett, J., and McIntyre, A., editors, The Running Springs Ranch site: University of California, Los Angeles, Institute of Archaeology Monograph 12.

Demere, T.A., Roeder, M.A., Chandler, R.M., and Minch, J.A., 1984, Paleontology of the middle Miocene Los Indios Member of the Rosarito Beach Formation, northwestern Baja California, Mexico, in Minch, J.A., and Ashby, J.R., Jr., editors, Miocene and Cretaceous depositional environments, northwestern Baja California, Mexico: American Association of Petroleum Geologists, Pacific Section, Guidebook 54:47-56.

Roeder, M.A., 1985, Late Wisconsin records of Gasterosteus aculeatus (threespine sticleback) and Gila bicolor (Mojave tui chub) from unnamed Mojave River sediments near Daggett, San Bernardino County, California, pp. 171-174, in Reynolds, R.E., compiler, Geological Investigations Along Interstate 15, Cajon Pass to Manix Lake: San Bernardino County Museum.

Kelly, T.S., Lander, E.B., Roeder, M.A., Whistler, D.P., and Reynolds, R.E., 1991, Preliminary report on a paleontologic investigation of the lower and middle members, Sespe Formation, Simi Valley Landfill, Ventura County, California: PaleoBios.

Whistler, D.P., Lander, E.B., and Roeder, M.A., 1995, First diverse record of small vertebrates from late Holocene sediments of Lake Cahuilla, Riverside County, California, in Reynolds, J., compiler, Abstracts from proceedings, The 1995 Desert Research Symposium: San Bernardino County Museum Association Quarterly 42(2):46.

Whistler, D.P., Lander, E.B., and Roeder, M.A., 1995, A diverse record of microfossils and fossil plants, invertebrates, and small vertebrates from the late Holocene Lake Cahuilla Beds, Riverside County, California, in Remeika, P., and Sturtz, A.editors, Paleontology and geology of the western Salton trough detachment, Anza-Borrego Desert State Park, California: San Diego Association of Geologist's field trip to Anza-Borrego Desert State Park, field trip guidebook and volume.

Roeder, M. A. 2004, Fossil Marine Fish Fauna from a late Pleistocene Site on Mission Bay, San Diego County, California. Abstracts of the Annual Meeting of the Southern California Academy of Sciences, Abstract No. 21.

Roeder, M. A. 2005, Fossil Fishes of the Anza-Borrego Region. Fossil Treasures of the Anza-Borrego Desert, A Symposium Exploring North America's Richest Continuous Fossil Record for the Last Seven Million Years. November 19-20, 2005 Borrego Springs, California.

Gensler, P., Roeder, M. A., and Jefferson, G. T., 2006, The Fossil Lower Vertebrates: Fish, Amphibians, and Reptiles in Jefferson, G. T. and Lindsay, L. editors, Fossil Treasures of the Anza Borrego Desert, Sunbelt Publications, San Diego.

EDUCATION

Bachelor of Arts, Anthropology, California State University, CA, 1988

Bachelor of Arts, Psychology, California State University, CA, 1988

PROFESSIONAL SUMMARY

Arthur Kuhner has 15 years experience in Southern California archaeology, as well as two years of experience in the Midwest and nine years in the Southeast (Florida, Georgia, Alabama, North Carolina, and South Carolina). He has spent the last nine years employed by Environmental Services, Inc. in Jacksonville, Florida. In his position as an archaeological crew chief, he was able to add to his prior urban and desert environs of Southern California working knowledge of historic and prehistoric buildings, structures, objects, artifacts, and cemeteries.

His positions over the last 26 years as an archaeologist in the Southeast, Southwest, and the Midwest have given him an excellent working knowledge of geology, botany and zoology as well as history and prehistoric and historic archaeology. He has also gained significant familiarity with any number of different prehistoric culture groups. Additionally, while working in Southern California, he had the opportunity to perform the duties of a paleontological monitor in the Chino Hills area. This entailed discovery, removal, preparation, and cataloging of Pleistocene and Miocene specimens.

RESPONSIBILITIES WITH ENVIRONMENTAL SERVICES, INC.

While working for Environmental Services, Inc., Mr. Kuhner was responsible for Cell Tower Assessment, Reconnaissance Surveys, the responsibilities of Crew Chief on Phase I, Phase II and Phase III Archaeological fieldwork, writing field reports; and the identification and processing of Historic Architecture, historic and prehistoric artifacts. Mr. Kuhner is also familiar with the Lieka and Trimbel GPS systems and the associated software.

Mr. Kuhner has also been intensively cross-trained within E.S.I. in Wetland Mitigation, Water Quality, Forestry, Endangered Species surveys, Wetland Creation and Site Assessment and Remediation.

REPRESENTATIVE PROJECT EXPERIENCE

Phase II Testing at Banning Ranch, Costa Mesa.

Employer: BonTerra Consulting
Date: 2009

Phase I Survey, Phase II Testing and Phase III Mitigation at Vincent Lugo Adobe, Bell Gardens.

Employer: Archaeological Consulting Services
Date: 1992

Phase I Survey and Phase II Testing; and Paleontological monitoring at Yorba Slaughter Adobe.

Employer: Archaeological Consulting Services
Date: 1994

Phase I Survey and II Testing at the Tuscan Landing Tract, Camden County, GA.

Employer: Environmental Services Inc
Date: 2005

Phase I Survey, Phase II Testing and III Mitigation at Site 8NA921 (The Brady Point Site), Nassau County, FL.

Employer: Environmental Services Inc
Date: 2004

Phase I Survey, Phase II Testing and Phase III Mitigation at the Jacksonville Baseball Park and Entertainment/Sports Arena, Duval County, FL.

Employer: Environmental Services Inc
Date: 2003

Phase I Survey, Phase II Testing and Phase III Mitigation at the Nocotee Tract, St. Johns County, FL.

Employer: Environmental Services Inc
Date: 2000–2008

Phase I Survey at the Oakleaf Tract, Clay and Duval County, FL.

Employer: Environmental Services Inc
Date: 2002

SELECTED PROFESSIONAL PUBLICATIONS

Kuhner, Arthur A., 1988. Coyote: Myth and the California Indian. Anthrologue II. California State University, Long Beach, Ca. including graphics.

Alexanderowicz, J. Stephen. A.Q Duffield-Stoll, S.R. Alexanderowicz, A. A Kuhner, et al. 1992. Historical Archaeology at the Vicente Lugo Adobe, City of Bell Gardens, County of Los Angeles, California. *ACS Technical Series No. 6.*

Kuhner; Arthur A. and Marsha A. Chance. 2006. A Cultural Resource Assessment Survey and Site Excavation at 8DU17801 at The Shangri La Subdivision, Duval County, Florida Report of Investigations No. 957.

Kuhner, Arthur A., Greg S. Hendryx, and Jennifer L.F. Nash. 2004. An Archaeological and Historical Assessment for the Existing St. Johns-Flagler Line Cellular Tower, St. Johns County, Florida. Report of Investigations No. 517.

Thompson, Sharyn, Marsha A. Chance, contributions by Arthur A. Kuhner. 2004. A Survey of Forty-five Historical Cemeteries in St. Johns County, Florida. Report of Investigations No. 572.

Kuhner, Arthur A. and Greg S. Hendryx. 2004. Intensive Cultural Resource Assessment Survey of the Tuscan Landing Tract Camden County, Georgia. Report of Investigation No. 665.

Kuhner; Arthur A. and Greg S. Hendryx. 2005. An Intensive Cultural Resource Assessment Survey of The Proposed Jessup Boardwalk and Park Tracts Wayne County, Georgia Report of Investigations No. 823.

PROFESSIONAL EXPERIENCE

BonTerra Consulting, 2009
Environmental Services Inc., 1999–2008
Wisconsin State Historical Society; Archaeological Consulting Services, Verona, WI, 1998
Archaeological Consulting Services, Verona, WI, 1997
Archaeological Consulting Services, San Bernardino, CA, 1991–1996
Chambers Group Inc., Santa Anna, CA, 1990–1991
Various C.R.M projects in Southern California, 1989–1990
California State University, Fullerton, CA, 1988
Various C.R.M. projects in Southern California, 1983–1987
Student Teacher, Los Angeles Board of Education,

APPENDIX B

FISHBONE AND FAUNAL ANALYSES

FISHBONE AND FAUNAL ANALYSES

Family	Genus	Species	Common	Count	Remarks
CA-ORA 839 VERTEBRATES					
	Myliobatis	*californica*	bat stringray	55	on rocky bottom and in kelp beds; in tidal to 150 feet
	Rhinobatos	productus	shovelnose guitarfish	8	sand or mud bottom in shallow coastal waters, bays, sloughs, and estuaries
	Triakididae			4	smoothhounds, leopard shark, soup fin shark
	Atractoscion	*nobilis*	white seabass	1	usually in schools over rocky bottom and in kelp beds also in surf zone
	Cynoscion	*parvipinnus*	shortfin corvina	1	shallow inshore sandy areas
	Porichthys	*myriaster*	specklefin midshipman	1	rocky and soft bottom, common in bays, spawns late spring or summer, eggs underside of rocks, male guards
	Porichthys		midshipman	5	two species found on sandy and muddy bottoms of bays
	Roncador	stearnsii	spotfin croaker	3	sandy shores and bays, mostly in shallow surf zone
	Semicossyphus	pulcher	California sheephead	1	prefers rocky bottom, in kelp beds
CA-ORA-906 VERTEBRATES					
Clupeidae			sardines and herrings	1	probably a sardine
	Hypsopsetta	*guttulata*	diamond turbot	5	mud to sand bottom, often in bays and sloughs found in water depths 5-150 feet
	Myliobatis	*califfornica*	bat stringray	5	very common in sandy and muddy and sloughs, also on rocky bottom and in kelp beds, In tidal to 150 feet
	Paralabrax		basses	1	three species off Southern California
	Paralichthys	*californicus*	Calif. Halibut	7	common on san bottom beyond the surfzone, and in bay and estuaries
	Porichthys		midshipman fish	7	two species found on sandy and muddy bottoms of bays
	Platyrhinoides	triseriata	thornback	5	sometimes abundant on mudflats of coastal bays
	Rhinobatos	productus	shovelnose guitarfish	26	sand or mud bottom in shallow coastal waters, bays, sloughs, and estuaries

FISHBONE AND FAUNAL ANALYSES
(Continued)

Family	Genus	Species	Common	Count	Remarks
CA-ORA-906 VERTEBRATES (Continued)					
Triakididae				25	smoothhounds, leopard shark, soupfin shark
	Anas	*cf. A. acuta*	northern pintail	4	abundant, widespread, common in marshes, open areas with ponds, lakes, year-round resident
	Anas	*cf. A. crecca*	green-winged teal	6	winter range in Southern California
	Anas	*cf. A. clypeata*	northern schoveler	1	found in marshes, ponds, lake in open country winter range in Southern California
	Anas	*cf. A. cyanoptera*	cinnamon teal	1	common in marshes, ponds, and lakes year-round resident
	Branta	*cf. B. canadensis*	Canada goose	4	winter range in Southern California
	Chen	*cf. C cerulescens*	snow goose	1	winter range in Southern California
	Fulica	*americana*	American coot	1	common to abundant, nests in freshwater marshes, wetlands, or near lakes and ponds, year-round resident
	Melanitta	*perspicilata*	surf scoter	2	winters on coastal water in southern California
	Oxyura	*cf. O. jamaicensis*	ruddy duck	1	year-round resident, large lakes, shallow bays, salt marshes
	Pelecanus	*occidentalis*	brown pelican	1	prefers saltwater habitats year-round
	Phalacrocorax	*auritus*	double-crested cormorant	1	common, widespread rocky coast, beaches, inland lakes and rivers, winters in Southern California
	Rallus	*longirostris*	clapper rail	2	year-round resident, inhabits coastal salt marshes
	Enhydra	*lutris*	sea otter	1	locally extinct since 1860s

APPENDIX C

CULTURAL SITES: UNIT EXCAVATION LOCATIONS

(Figures not included for reasons of confidentiality)

APPENDIX D

CATALOG

ORA-839 CATALOG

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
1	Ora-839	A	1	0-10	shell	Neverita reclusians	B/OC			4	
2	Ora-839	A	1	0-10	shell	Argopecten sp.	B/E			1	
3	Ora-839	A	1	0-10	shell	Chione spp.	B/E			12	
4	Ora-839	A	1	0-10	shell	Chione californiensis	B/OC			4	
5	Ora-839	A	1	0-10	shell	Chione undatella	B/E			1	
6	Ora-839	A	1	0-10	shell	Astraea undosa	B/E			2	
7	Ora-839	A	1	0-10	shell	Psuedochama sp.	RS/OC			1	
8	Ora-839	A	1	0-10	shell	Oystrea	B/OC			1	
9	Ora-839	A	1	0-10	shell	Gastropod	B/OC	columella		1	
10	Ora-839	A	1	0-10	shell	Gastropod	B/OC			1	
11	Ora-839	A	1	0-10	shell	Gastropod	B/OC			3	
12	Ora-839	A	1	0-10	Faunal	Chondricthyes	centrum			1	
13	Ora-839	A	1	0-10	Faunal	mammal			burnt	1	
14	Ora-839	A	1	0-10	Faunal	rodent		long bone		1	
15	Ora-839	A	1	0-10	lithic	groundstone		fragment	metavolcanic	1	11.1g
16	Ora-839	A	1	0-10	lithic	core/scraper	spent	retouched	Monterey	1	12.1g
17	Ora-839	A	1	0-10	lithic	debitage			quartz	1	13.1g
18	Ora-839	A	1	0-10	lithic	debitage	cubic shatter		chert	2	3.1g
19	Ora-839	A	1	0-10	lithic	debitage	cubic shatter		metavolcanic	1	0.1g
20	Ora-839	A	1	10-20c	shell	Chione californiensis	B/OC			8	
21	Ora-839	A	1	10-20c	shell	Chione undatella	B/E			1	
22	Ora-839	A	1	10-20c	shell	Chione spp.	B/E			15	
23	Ora-839	A	1	10-20c	shell	Argopecten sp.	B/E			2	
24	Ora-839	A	1	10-20c	shell	Saxidomus	B/E			1	
25	Ora-839	A	1	10-20c	shell	Astraea undosa	B/E			5	
26	Ora-839	A	1	10-20c	shell	Ostrea	B/E			5	
27	Ora-839	A	1	10-20c	shell	Crepidula sp.	B/E	RS/OC		1	
28	Ora-839	A	1	10-20c	shell	Neverita reclusians	B/OC			1	
29	Ora-839	A	1	10-20c	shell	Gastropod	B/OC			2	
30	Ora-839	A	1	10-20c	faunal	Roncador stearnsii	sp.	otolith	left	1	
31	Ora-839	A	1	10-20c	faunal	Myliobatis californica		teeth		3	
32	Ora-839	A	1	10-20c	faunal	fish	vertebra			1	
33	Ora-839	A	1	10-20c	faunal	shark	centrum			1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
34	Ora-839	A	1	10-20c	faunal	Rhinobatus productus	centrum			1	
35	Ora-839	A	1	10-20c	faunal	Porichthys	vertebrae			1	
36	Ora-839	A	1	10-20c	faunal	mammal		bone frag		1	
37	Ora-839	A	1	10-20c	lithic	debitage	tertiary		Monterey	1	1.2g
38	Ora-839	A	1	10-20c	lithic	debitage	cubic shatter		quartzite	1	0.4g
39	Ora-839	A	1	10-20c	lithic	debitage	cubic shatter		quartzite	2	0.3g
40	Ora-839	A	1	20-30c	shell	Chione undatella	B/E			2	
41	Ora-839	A	1	20-30c	shell	Chione sp.	B/E			14	
42	Ora-839	A	1	20-30c	shell	Chione californiensis	B/OC			21	
43	Ora-839	A	1	20-30c	shell	Foreria belcheri				1	
44	Ora-839	A	1	20-30c	shell	Astraea undosa				5	
45	Ora-839	A	1	20-30c	shell	Saxodomus nuttali	B/E			1	
46	Ora-839	A	1	20-30c	shell	Macoma nasuta	S/B			1	
47	Ora-839	A	1	20-30c	shell	Pseudochama exogyra	B/OC			6	
48	Ora-839	A	1	20-30c	shell	Neverita reclusians	B/OC			13	
49	Ora-839	A	1	20-30c	shell	Argopecten sp.	B/E			13	
50	Ora-839	A	1	20-30c	shell	Acanthina spirata				1	
51	Ora-839	A	1	20-30c	shell	Ostrea	B/OC			6	
52	Ora-839	A	1	20-30c	shell	Bursa californica	B/OC			2	
53	Ora-839	A	1	20-30c	shell	Crepidula sp.	RS/OC			2	
54	Ora-839	A	1	20-30c	faunal	Roncador stearnsii	otolith	left		1	
55	Ora-839	A	1	20-30c	faunal	bony fish	vertebra			1	
56	Ora-839	A	1	20-30c	faunal	bony fish	fin spine			1	
57	Ora-839	A	1	20-30c	faunal	shark		calcified cartl.		1	
58	Ora-839	A	1	20-30c	faunal	shark		centrum		1	
59	Ora-839	A	1	20-30c	faunal	Myliobatis californica		tooth		1	
60	Ora-839	A	1	20-30c	faunal	Myliobatis californica	centrum			1	
61	Ora-839	A	1	20-30c	faunal	shark	centrum		burnt	1	
62	Ora-839	A	1	20-30c	faunal	shark	centrum			1	
63	Ora-839	A	1	20-30c	faunal	Rhinobatus productus	centrum			1	
64	Ora-839	A	1	20-30c	faunal	shark	centrum			1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
65	Ora-839	A	1	20-30c	faunal	small mammal	femur	fragment		2	
66	Ora-839	A	1	20-30c	lithic	flakes	tertiary		jasper/r. quartz	2	0.5
67	Ora-839	A	1	30-40	shell	Chione undatella	B/E			16	
68	Ora-839	A	1	30-40	shell	Chione californiensis	B/OC			16	
69	Ora-839	A	1	30-40	shell	Chione sp.	B/E			16	
70	Ora-839	A	1	30-40	shell	Argopecten sp.	B/E			17	
71	Ora-839	A	1	30-40	shell	Pseudochama exogyra	B/OC			4	
72	Ora-839	A	1	30-40	shell	Cerithidea californica				1	
73	Ora-839	A	1	30-40	shell	Neverita reclusians				4	
74	Ora-839	A	1	30-40	shell	Kellia suborbicularis	RS			1	
75	Ora-839	A	1	30-40	shell	Crepidula sp.	RS/OC			3	
76	Ora-839	A	1	30-40	shell	Astraea undosa	RS/OC			1	
77	Ora-839	A	1	30-40	shell	Calyptrea sp.	RS/OC			1	
78	Ora-839	A	1	30-40	shell	Ostrea	B/OC			4	
79	Ora-839	A	1	30-40	faunal	Myliobatis californica		teeth		3	
80	Ora-839	A	1	30-40	faunal	mammal		bone frag.		1	
81	Ora-839	A	1	30-40	lithic	debitage	cubic shatter			1	1.0g
82	Ora-839	A	1	30-40	shell	Saxidomus nuttali	B/E			1	
83	Ora-839	A	1	30-40	lithic	debitage	flake	(cf. felsite)	metavolcanic	1	4.3g
84	Ora-839	A	1	30-40f	shell	Astraea undosa	Feature 1			1	
85	Ora-839	A	1	40-50	shell	Chione undatella	B/E			9	
86	Ora-839	A	1	40-50	shell	Chione sp.	B/E			12	
87	Ora-839	A	1	40-50	shell	Chione fluctifraga	B/E			3	
88	Ora-839	A	1	40-50	shell	Chione californiensis	B/OC			56	
89	Ora-839	A	1	40-50	shell	Argopecten sp.	RS/OC			56	
90	Ora-839	A	1	40-50	shell	Neverita reclusians	B/OC			12	
91	Ora-839	A	1	40-50	shell	Hinnites				1	
92	Ora-839	A	1	40-50	shell	Ostrea lurida	B/OC			23	
93	Ora-839	A	1	40-50	shell	Astraea undosa	operculi			6	
94	Ora-839	A	1	40-50	shell	Mytilus spp.	RS/OC			2	
95	Ora-839	A	1	40-50	shell	Pseudochama exogyra	RS/OC			1	
96	Ora-839	A	1	40-50	shell	Bursa californica	RS/OC			1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
97	Ora-839	A	1	40-50	shell	Cerithidea californica				1	
98	Ora-839	A	1	40-50	shell	Crepidula sp.	RS/OC			6	
99	Ora-839	A	1	40-50	shell	Calyptrea sp.	RS/OC			1	
100	Ora-839	A	1	40-50	shell	Anomia peruviana				1	
101	Ora-839	A	1	40-50	shell	Acanthina spirata				1	
102	Ora-839	A	1	40-50	faunal	Cynoscion parvipinnus	otolith	right		1	
103	Ora-839	A	1	40-50	faunal	Rhinobatus productus	centrum			1	
104	Ora-839	A	1	40-50	faunal	Triakidae	centrum		frags.	2	
105	Ora-839	A	1	40-50	faunal	shark	centrum			1	
106	Ora-839	A	1	40-50	faunal	shark	centrum		frag	1	
107	Ora-839	A	1	40-50	faunal	Semicossyphus pulcher	pharangeal		frag	1	
108	Ora-839	A	1	40-50	faunal	mammal	long bone	distal		1	
109	Ora-839	A	1	40-50	faunal	bony fish	quarate		frag	1	
110	Ora-839	A	1	40-50	faunal	mammal	bone		frags.	3	
111	Ora-839	A	1	40-50	shell	Conus californicus	bead	spire-lopped		1	
112	Ora-839	A	1	40-50	debitage	flake	tertiary		chert	1	0.1g
113	Ora-839	A	1	40-50	debitage	flake	primary		chert	1	0.3g
114	Ora-839	A	1	40-50	debitage	core	tertiary	fragment	Monterey	1	6.4g
115	Ora-839	A	1	40-50	debitage	flake	cubic shatter		quartzite	1	1.2g
116	Ora-839	A	1	40-50	debitage	flake	cubic shatter		quartzite	1	0.5g
117	Ora-839	A	1	40-50	shell	Gastropod				1	
118	Ora-839	A	1	50-60	shell	Chione undatella	B/E			13	
119	Ora-839	A	1	50-60	shell	Chione sp.	B/E			23	
120	Ora-839	A	1	50-60	shell	Chione californiensis	B/OC			28	
121	Ora-839	A	1	50-60	shell	Argopecten sp.	B/E			40	
122	Ora-839	A	1	50-60	shell	Mytilus spp.	RS/OC			4	
123	Ora-839	A	1	50-60	shell	Cerithidea californica				2	
125	Ora-839	A	1	50-60	shell	Littorina scutulata				1	
126	Ora-839	A	1	50-60	shell	Conus californicus	RS/OC			1	
127	Ora-839	A	1	50-60	shell	Ocenebra japonica	RS/OC			1	
128	Ora-839	A	1	50-60	shell	Neverita reclusians	B/OC			4	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
129	Ora-839	A	1	50-60	shell	Astraea undosa				2	
130	Ora-839	A	1	50-60	shell	Crepidula sp.	RS/OC			7	
131	Ora-839	A	1	50-60	shell	Ostrea laurida	B/OC			14	
132	Ora-839	A	1	50-60	shell	Calyptrea sp.	RS/OC			1	
133	Ora-839	A	1	50-60	shell	Psuedochama sp.	RS/OC			10	
134	Ora-839	A	1	50-60	faunal	Atractoscion noblis		right		1	
135	Ora-839	A	1	50-60	faunal	Myliobatis californica	teeth		burned	3	
136	Ora-839	A	1	50-60	faunal	Myliobatis californica	centrum			1	
137	Ora-839	A	1	50-60	faunal	Myliobatis californica	centrum			1	
138	Ora-839	A	1	50-60	faunal	shark	centrum	burned	fragment	1	
139	Ora-839	A	1	50-60	faunal	shark	centrum			1	
140	Ora-839	A	1	50-60	faunal	Myliobatis californica	centrum		fragment	1	
141	Ora-839	A	1	50-60	faunal	shark	centrum		fragment	1	
142	Ora-839	A	1	50-60	faunal	bony fish		burned	fragment	1	
143	Ora-839	A	1	50-60	faunal	snake	vertebra			1	
144	Ora-839	A	1	50-60	faunal	shark	centrum			1	
145	Ora-839	A	1	50-60	faunal	mammal		burned	fragments	4	
146	Ora-839	A	1	50-60	faunal	mammal			fragments	5	
147	Ora-839	A	1	60-70	shell	Chione undatella				7	
148	Ora-839	A	1	60-70	shell	Chione californiensis				8	
149	Ora-839	A	1	60-70	shell	Chione sp.	B/E			19	
150	Ora-839	A	1	60-70	shell	Neverita reclusians	B/OC			3	
151	Ora-839	A	1	60-70	shell	Tegula sp.				1	
152	Ora-839	A	1	60-70	shell	Cerithidea californica				1	
153	Ora-839	A	1	60-70	shell	Argopecten sp.	B/E			20	
154	Ora-839	A	1	60-70	shell	Crepidula sp.	RS/OC			3	
155	Ora-839	A	1	60-70	shell	Calyptrea sp.	RS/OC			1	
156	Ora-839	A	1	60-70	shell	gastropod	RS/OC			1	
157	Ora-839	A	1	60-70	shell	Anovia peruviana	RS/OC			1	
158	Ora-839	A	1	60-70	shell	Ostrea lurida	B/OC			10	
159	Ora-839	A	1	60-70	shell	Donax gouldi	S/B			1	
160	Ora-839	A	1	60-70	shell	Pseudochama exogyra	RS/OC			2	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
161	Ora-839	A	1	60-70	shell	Mytilus spp.	RS/OC			tr.	
162	Ora-839	A	1	60-70	shell	Anomia peruviana				3	
163	Ora-839	A	1	60-70	shell	Astraea undosa	RS/OC			2	
164	Ora-839	A	1	60-70	faunal	Myliobatis californica	tooth		burned	1	
165	Ora-839	A	1	60-70	faunal	bony fish	quadrate			1	
166	Ora-839	A	1	60-70	faunal	Porichthys	vertebra	precaudal		1	
167	Ora-839	A	1	60-70	faunal	bony fish	vertebra		fragment	1	
168	Ora-839	A	1	60-70	faunal	Porichthys	vertebra	precaudal	burned	1	
169	Ora-839	A	1	60-70	faunal	Myliobatis californica	centrum			1	
170	Ora-839	A	1	60-70	faunal	Myliobatis californica	centrum			1	
171	Ora-839	A	1	60-70	faunal	shark	centrum			1	
172	Ora-839	A	1	60-70	faunal	Rhinobatus productus	centrum			1	
173	Ora-839	A	1	60-70	faunal	shark	centrum	fragment		1	
174	Ora-839	A	1	60-70	faunal	Triakidae	centrum	fragment		1	
175	Ora-839	A	1	60-70	faunal	mammal		fragment	2 burned	3	
176	Ora-839	A	1	60-70	faunal	snake	vertebra			1	
177	Ora-839	A	1	60-70	lithic	debitage	shatter		quartz	1	0.1g
178	Ora-839	A	1	60-70	lithic	debitage	shatter		metavolcanic	1	0.1g
179	Ora-839	A	1	60-70	lithic	debitage	shatter		Monterey	1	<0.1g
180	Ora-839	A	1	60-70	lithic	debitage	tertiary		Quartzite	1	1.5g
181	Ora-839	A	1	60-70	lithic	groundstone	fragment		glaucophane schist	1	28.4g
182	Ora-839	A	1	70-80	shell	Chione undatella	B/E			6	
183	Ora-839	A	1	70-80	shell	Chione sp.	B/E			9	
184	Ora-839	A	1	70-80	shell	Chione californiensis	B/OC			2	
185	Ora-839	A	1	70-80	shell	Argopecten sp.	B/E			13	
186	Ora-839	A	1	70-80	shell	Astraea undosa	RS/OC			2	
187	Ora-839	A	1	70-80	shell	Neverita reclusians	B/OC			1	
188	Ora-839	A	1	70-80	shell	Tegula sp.				1	
189	Ora-839	A	1	70-80	shell	Crepidula sp.	RS/OC			5	
190	Ora-839	A	1	70-80	shell	Chiton sp.	RS/OC	plate		1	
191	Ora-839	A	1	70-80	shell	Anomia peruviana				3	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
192	Ora-839	A	1	70-80	shell	Gastropod				1	
193	Ora-839	A	1	70-80	shell	Ostrea lurida	B/OC			3	
194	Ora-839	A	1	70-80	faunal	Rhinobatus productus	centrum			1	
195	Ora-839	A	1	70-80	faunal	Porichthys	vertebra	precaudal		1	
196	Ora-839	A	1	70-80	faunal	bony fish	vertebra	fragment		1	
197	Ora-839	A	1	70-80	faunal	shark	centrum			1	
198	Ora-839	A	1	70-80	faunal	Rhinobatus productus	centrum	fragment		1	
199	Ora-839	A	1	70-80	faunal	Myliobatis californica	tooth	burned		1	
200	Ora-839	A	1	70-80	faunal	Triakidae	centrum	fragment		1	
201	Ora-839	A	1	70-80	faunal	rabbit	bone	proximal		1	
202	Ora-839	A	1	70-80	faunal	mammal	bone	fragment		7	
203	Ora-839	A	1	70-80	faunal	mammal	bone	fragment	burned	4	
204	Ora-839	A	1	70-80	faunal	snake	vertebra			1	
205	Ora-839	A	1	70-80	shell	Mytilus spp.	RS/OC			tr.	
206	Ora-839	A	1	70-80	lithic	debitage	debitage	flake-bulb	obsidian	1	<0.1g
207	Ora-839	A	1	70-80	lithic	debitage	shatter			1	0.2g
208	Ora-839	A	1	70-80	lithic	debitage	shatter	primary		1	<0.1g
209	Ora-839	A	2	0-10	shell	Chione spp.				1	
210	Ora-839	A	2	0-10	faunal	mammal	bone	fragment		2	
211	Ora-839	A	2	0-10	lithic	debitage	cubic shatter		3 quartzite; 1 chert; 1 metavolcanic	5	2.9g
212	Ora-839	A	2	10-20c	shell	Chione californiensis	B/OC			4	
213	Ora-839	A	2	10-20c	shell	Chione spp.	B/E			12	
214	Ora-839	A	2	10-20c	shell	Neverita reclusianus	B/OC			6	
215	Ora-839	A	2	10-20c	shell	Astrea undosa	RS/OC			6	
216	Ora-839	A	2	10-20c	faunal	Myliobatis californica	tooth			1	
217	Ora-839	A	2	10-20c	lithic	debitage	shatter		quartz	1	0.3g
218	Ora-839	A	2	10-20c	lithic	debitage	shatter	burnt	chert	1	0.7g
219	Ora-839	A	2	10-20c	lithic	debitage	flake	bulb	Monterey chert	1	<0.1g
220	Ora-839	A	2	10-20C	lithic	flake	fragment base	retouched	quartz	1	1.4g
221	Ora-839	A	2	20-30	shell	Chione undatella				1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
222	Ora-839	A	2	20-30	shell	Chione californiensis				3	
223	Ora-839	A	2	20-30	shell	Chione spp.				7	
224	Ora-839	A	2	20-30	shell	Ostrea lurida				1	
225	Ora-839	A	2	20-30	shell	Argopecten sp.				1	
226	Ora-839	A	2	20-30	shell	Psuedochama sp.				1	
227	Ora-839	A	2	20-30	shell	Neverita reclusianus				2	
228	Ora-839	A	2	20-30	shell	Astraea undosa				tr.	
229	Ora-839	A	2	20-30	faunal	Myliobatis californica	tooth		burnt	1	
230	Ora-839	A	2	20-30	faunal	shark	centrum	fragment		1	
231	Ora-839	A	2	20-30	faunal	mammal	bone	fragment		1	
232	Ora-839	A	2	20-30	faunal	mammal	bone	fragment	burnt	1	
233	Ora-839	A	2	20-30	lithic	debitage	cubic shatter		metavolcanic	3	1.4g
234	Ora-839	A	2	20-30	lithic	debitage	shatter		Monterey chert	1	0.2g
235	Ora-839	A	2	30-40	shell	Chione spp.				2	
236	Ora-839	A	2	30-40	shell	Chione californiensis				1	
237	Ora-839	A	2	30-40	shell	Neverita reclusianus				2	
238	Ora-839	A	2	30-40	shell	Ostrea lurida				1	
239	Ora-839	A	2	30-40	shell	Pseudochama exogyra				tr.	
240	Ora-839	A	2	30-40	shell	Gastropod				1	
241	Ora-839	A	2	30-40	faunal	Myliobatis californica	tooth	burnt		1	
242	Ora-839	A	2	30-40	faunal	shark	clasper	cartilage	calcified	1	
243	Ora-839	A	2	30-40	lithic	debitage	flake	pressure?	rosy quartz	2	0.1g
244	Ora-839	A	2	30-40	lithic	debitage	shatter		Monterey chert	2	4.3g
245	Ora-839	A	2	30-40	lithic	debitage	shatter		metavolcanic	4	1.5g
246	Ora-839	A	2	40-50	shell	Chione californiensis				3	
247	Ora-839	A	2	40-50	shell	Chione spp.				11	
248	Ora-839	A	2	40-50	shell	Argopecten sp.				2	
249	Ora-839	A	2	40-50	shell	Saxidomus nuttali				1	
250	Ora-839	A	2	40-50	shell	Neverita reclusianus				1	
251	Ora-839	A	2	40-50	shell	Astraea undosa				tr.	
252	Ora-839	A	2	40-50	faunal	shark	centrum			1	
253	Ora-839	A	2	40-50	faunal	mammal bone	fragments			5	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
254	Ora-839	A	2	40-50	lithic	flake	bulb+shatter		quartzite	2	6.2g
255	Ora-839	A	2	40-50	lithic	flake	shatter		quartzite	1	0.2g
256	Ora-839	A	2	50-60	shell	Chione californiensis				10	
257	Ora-839	A	2	50-60	shell	Chione spp.				7	
258	Ora-839	A	2	50-60	shell	Argopecten sp.				10	
259	Ora-839	A	2	50-60	shell	Neverita reclusianus				1	
260	Ora-839	A	2	50-60	shell	Pseudochama exogyra				4	
261	Ora-839	A	2	50-60	shell	Astraea undosa				tr.	
262	Ora-839	A	2	50-60	shell	Tivela stultorum				1	
263	Ora-839	A	2	50-60	faunal	Myliobatis californica	centrum			1	
264	Ora-839	A	2	50-60	faunal	mammal	bone	calcined		1	
265	Ora-839	A	2	50-60	faunal	mammal	bone	fragment		1	
266	Ora-839	A	2	50-60	lithic	utilized flake		utilized edge	quartzite	1	75.3g
267	Ora-839	A	2	50-60	lithic	primary flake	shatter		Monterey chert	1	7.8g
268	Ora-839	A	2	50-60	lithic	tertiary flakes	shatter		Monterey chert	3	3.8g
269	Ora-839	A	2	60-70	shell	Chione spp.				2	
270	Ora-839	A	2	60-70	shell	Chione californiensis				2	
271	Ora-839	A	2	60-70	shell	Chione undatella				1	
272	Ora-839	A	2	60-70	shell	Argopecten sp.				2	
273	Ora-839	A	2	60-70	shell	Pseudochama exogyra				1	
274	Ora-839	A	2	60-70	shell	Ostrea lurida				tr.	
275	Ora-839	A	2	60-70	shell	Neverita reclusianus				tr.	
276	Ora-839	A	2	60-70	faunal	Myliobatis californica	tooth	burnt		1	
277	Ora-839	A	2	60-70	faunal	shark	centrum	fragment			
278	Ora-839	A	2	70-80	shell	Chione spp.				14	
279	Ora-839	A	2	70-80	shell	Chione undatella				2	
280	Ora-839	A	2	70-80	shell	Chione californiensis				9	
281	Ora-839	A	2	70-80	shell	Argopecten sp.				14	
282	Ora-839	A	2	70-80	shell	Neverita reclusianus				5	
283	Ora-839	A	2	70-80	shell	Pseudochama exogyra				5	
284	Ora-839	A	2	70-80	shell	Astraea undosa				1	
285	Ora-839	A	2	70-80	shell	Ostrea lurida				3	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
286	Ora-839	A	2	70-80	shell	Crepidula sp.				1	
287	Ora-839	A	2	70-80	shell	Ocenebra lurida				1	
288	Ora-839	A	2	70-80	shell	bivalve				1	
289	Ora-839	A	2	70-80	faunal	shark	centrum	burnt		1	
290	Ora-839	A	2	70-80	faunal	Myliobatis californica	tooth			1	
291	Ora-839	A	2	70-80	faunal	mammal	bone	fragment		8	
292	Ora-839	A	2	70-80	faunal	mammal sm.	bone	fragment		1	
293	Ora-839	A	2	70-80	faunal	Porichthys	vertebra	precaudal	fragment	1	
294	Ora-839	A	2	70-80	lithic	core	battered		quartz	1	50.0g
295	Ora-839	A	2	70-80	lithic	debitage	shatter		Monterey chert	1	0.2g
296	Ora-839	A	2	70-80	lithic	debitage	shatter	1 pressure	rosy quartz	2	0.6g
297	Ora-839	A	2	70-80	lithic	debitage	shatter		quartz	1	0.2g
298	Ora-839	A	2	80-90	shell	Chione spp.				8	
299	Ora-839	A	2	80-90	shell	Chione undatella				9	
300	Ora-839	A	2	80-90	shell	Chione californiensis				9	
301	Ora-839	A	2	80-90	shell	Pseudochama exogyra				5	
302	Ora-839	A	2	80-90	shell	Hinnites sp.				1	
303	Ora-839	A	2	80-90	shell	Argopecten sp.				21	
304	Ora-839	A	2	80-90	shell	Neverita reclusianus				3	
305	Ora-839	A	2	80-90	shell	Bursa californica				1	
306	Ora-839	A	2	80-90	shell	Crepidula sp.				1	
307	Ora-839	A	2	80-90	shell	Astraea undosa				1	
308	Ora-839	A	2	80-90	shell	Ostrea lurida				8	
309	Ora-839	A	2	80-90	shell	Mytilus sp.				1	
310	Ora-839	A	2	80-90	faunal	shark	centrum			1	
311	Ora-839	A	2	80-90	faunal	mammal	bone	fragment		1	
312	Ora-839	A	2	80-90	lithic	debitage	shatter		Monterey chert	1	0.1
313	Ora-839	A	2	80-90	lithic	debitage	shatter		quartzite	2	1.4
314	Ora-839	A	2	80-90	lithic	debitage	shatter		chert		0.2
315	Ora-839	A	2	90-sterile	shell	Chione spp.				6	
316	Ora-839	A	2	90-sterile	shell	Chione californiensis				8	
317	Ora-839	A	2	90-sterile	shell	Chione undatella				4	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
318	Ora-839	A	2	90-sterile	shell	Argopecten sp.				6	
319	Ora-839	A	2	90-sterile	shell	Astraea undosa				3	
320	Ora-839	A	2	90-sterile	shell	Neverita reclusianus				2	
321	Ora-839	A	2	90-sterile	shell	Ostrea lurida				2	
322	Ora-839	A	2	90-sterile	shell	Crepidula sp.				2	
323	Ora-839	A	2	90-sterile	shell	Mollusca sp.				1	
324	Ora-839	A	2	90-sterile	shell	Mytilus sp.				tr.	
325	Ora-839	A	2	90-sterile	faunal	shark	centrum			1	
326	Ora-839	A	2	90-sterile	lithic	manuport	crystaline faces		quartz	1	8.5g
327	Ora-839	B	1	0-10	shell	Chione californiensis				3	
328	Ora-839	B	1	0-10	shell	Chione spp.				13	
329	Ora-839	B	1	0-10	shell	Argopecten sp.				1	
330	Ora-839	B	1	0-10	shell	Neverita reclusianus				3	
331	Ora-839	B	1	0-10	shell	Laevicardium sp.				1	
332	Ora-839	B	1	0-10	shell	Astraea undosa				1	
333	Ora-839	B	1	0-10	shell	Bursa californica				1	
334	Ora-839	B	1	0-10	shell	Cerithidea californica				1	
335	Ora-839	B	1	0-10	shell	Ostrea lurida				2	
336	Ora-839	B	1	0-10	shell	Mytilus sp.				1	
337	Ora-839	B	1	0-10	lithic	flake	shatter		quartzite	1	0.6g
338	Ora-839	B	1	10-20c	shell	Chione spp.				10	
339	Ora-839	B	1	10-20c	shell	Neverita reclusianus				1	
340	Ora-839	B	1	10-20c	shell	Argopecten sp.				2	
341	Ora-839	B	1	10-20c	shell	Psuedochama exogyra				3	
342	Ora-839	B	1	10-20c	shell	Astraea undosa				1	
343	Ora-839	B	1	10-20c	shell	Ostrea lurida				3	
344	Ora-839	B	1	10-20c	shell	Crepidula sp.				1	
345	Ora-839	B	1	10-20c	faunal	mammal	bone	fragment	burnt	3	
346	Ora-839	B	1	10-20c	shell	Gastropod				2	
347	Ora-839	B	1	20-30	shell	Chione spp.				6	
348	Ora-839	B	1	20-30	shell	Argopecten sp.				4	
349	Ora-839	B	1	20-30	shell	Astraea undosa				tr.	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
350	Ora-839	B	1	20-30	shell	Gastropod	columella			1	
351	Ora-839	B	1	20-30	faunal	Rhinobatus productus	centrum			1	
352	Ora-839	B	1	20-30	lithic	flake	bulb/shatter		Monterey chert	1	0.9g
353	Ora-839	B	1	20-30	lithic	flake	shatter		quartzite	2	0.7g
354	Ora-839	B	1	30-40	shell	Chione californiensis				1	
355	Ora-839	B	1	30-40	faunal	mammal	bone	small		1	
356	Ora-839	B	1	30-40	lithic	debitage	flake+shatter	1 bulb	Monterey chert	3	1.8g
357	Ora-839	B	1	30-40	lithic	debitage	shatter		chert	4	1.2g
358	Ora-839	B	1	30-40	lithic	debitage	flake+shatter		quartzite	2	4.1g
359	Ora-839	B	1	40-50	shell	Neverita reclusianus				1	
360	Ora-839	B	1	40-50	lithic	flake	tertiary		rosy quartz	1	1.0g
361	Ora-839	B	1	40-50	lithic	mano	bifacial	fragment	diorite	1	157.9g
362	Ora-839	B	1	50-60	faunal	shark	centrum	bead		1	
363	Ora-839	B	1	50-60	faunal	Myliobatis californica	centrum			1	
364	Ora-839	B	1	50-60	faunal	mammal	bone	fragments		4	
365	Ora-839	B	1	50-60	lithic	flake	bulb	pressure	obsidian	1	0.1g
366	Ora-839	B	1	50-60	lithic	flake	shatter		rosy quartz	1	0.2g
367	Ora-839	B	1	60-70	shell	Chione californiensis				1	
368	Ora-839	B	1	60-70	shell	Argopecten sp.				1	
369	Ora-839	B	1	60-70	faunal	Myliobatis californica	bone		calcined	1	
370	Ora-839	B	1	60-70	lithic	flake	tertiary	large	quartz	1	15.5g
371	Ora-839	B	1	60-70	lithic	debitage	shatter		Monterey chert	2	1.6g
372	Ora-839	B	1	60-70	lithic	debitage	shatter	burnt	chert	1	0.8g
373	Ora-839	B	1	60-70	lithic	debitage	flake	bulb	metavolcanic	1	0.7g
374	Ora-839	B	1	60-70	lithic	debitage	core	retouch	flake	1	5.0g
375	Ora-839	B	2	0-10	shell	Psuedochama sp.				2	
376	Ora-839	B	2	0-10	shell	Neverita reclusianus				1	
377	Ora-839	B	2	0-10	shell	Chione spp.				4	
378	Ora-839	B	2	0-10	shell	Astraea undosa				1	
379	Ora-839	B	2	0-10	shell	Ostrea lurida				3	
380	Ora-839	B	2	0-10	shell	Mollusca				1	
381	Ora-839	B	2	0-10	faunal	mammal	bone	fragments		2	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
382	Ora-839	B	2	0-10	lithic	debitage	shatter		Monterey chert	2	0.5g
383	Ora-839	B	2	0-10	lithic	debitage	shatter		rosy quartz	2	0.5g
384	Ora-839	B	2	0-10	lithic	debitage	flake		metavolcanic	1	0.3g
385	Ora-839	B	2	10-20c	shell	Chione californiensis				2	
386	Ora-839	B	2	10-20c	shell	Chione spp.				4	
387	Ora-839	B	2	10-20c	shell	Argopecten sp.				1	
388	Ora-839	B	2	10-20c	shell	Neverita reclusianus				1	
389	Ora-839	B	2	10-20c	shell	Astraea undosa				tr.	
390	Ora-839	B	2	10-20c	shell	Ostrea lurida				3	
391	Ora-839	B	2	10-20c	shell	Psuedochama sp.				1	
392	Ora-839	B	2	10-20c	shell	gastropod	columella			1	
393	Ora-839	B	2	10-20c	faunal	Roncador stearnsii	otolith			1	
394	Ora-839	B	2	10-20c	faunal	mammal	bone	fragment		1	
395	Ora-839	B	2	10-20c	faunal	mammal	bone			3	
396	Ora-839	B	2	10-20c	historic	glass	opalized			1	
397	Ora-839	B	2	10-20c	lithic	debitage			quartzite	1	0.3g
398	Ora-839	B	2	10-20c	lithic	debitage			metavolcanic	1	2.6g
399	Ora-839	B	2	20-30	lithic	debitage	shatter		Monterey chert	1	0.9g
400	Ora-839	B	2	20-30	lithic	debitage	shatter		metavolcanic	1	0.3g
401	Ora-839	B	2	20-30	shell	Argopecten sp.				tr.	
402	Ora-839	B	2	20-30	faunal	mammal				1	
403	Ora-839	B	2	30-40	shell	Mollusca				1	
404	Ora-839	B	2	30-40	lithic	debitage	1 flake	1 shatter	andesite	2	1.5g
405	Ora-839	B	2	30-40	lithic	debitage	flakes	primary	metavolcanic	2	29.2g
406	Ora-839	B	2	30-40	lithic	debitage	flake	tertiary	rosy quartz	1	0.3g
407	Ora-839	B	2	30-40	lithic	debitage	flake	tertiary	chert	1	1.1g
408	Ora-839	B	2	40-50	shell	Chione californiensis				tr.	
409	Ora-839	B	2	40-50	lithic	debitage	flake	tertiary	Monterey chert	1	8.1g
410	Ora-839	B	2	40-50	lithic	debitage	shatter		chert	2	0.9g
411	Ora-839	B	2	40-50	lithic	debitage	shatter		andesite	2	0.8g
412	Ora-839	B	2	50-60	shell	Leptopectin sp.	fossil				
413	Ora-839	B	2	50-60	faunal	mammal	bone	fragment		2	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
414	Ora-839	B	2	50-60	lithic	debitage	flake	tertiary	Monterey chert	1	0.3g
415	Ora-839	B	2	50-60	lithic	debitage	flakes	tertiary	quartzite	2	0.7g
416	Ora-839	B	2	50-60	lithic	debitage	shatter		quartzite	1	
417	Ora-839	B	2	60-70	shell	Argopecten sp.				tr.	
418	Ora-839	B	2	60-70	lithic	debitage	shatter		Monterey chert	1	0.3g
419	Ora-839	B	2	60-70	lithic	debitage	shatter		quartzite	1	0.2g
420	Ora-839	B	2	60-70	lithic	debitage	shatter	1 flake	andesite	3	1.3g
421	Ora-839	B	2	70-80	shell	Chione undatella				3	
422	Ora-839	B	2	70-80	shell	Chione spp.				4	
423	Ora-839	B	2	70-80	faunal	Myliobatis californica	tooth	burnt		1	
424	Ora-839	B	2	70-80	faunal	mammal	bone	fragment	burnt	1	
425	Ora-839	B	2	80-90	shell	Chione sp.				3	
426	Ora-839	B	2	80-90	shell	Argopecten sp.				tr.	
427	Ora-839	C	1	0-10	shell	Chione undatella				1	
428	Ora-839	C	1	0-10	shell	Chione spp.				13	
429	Ora-839	C	1	0-10	shell	Chione californiensis				9	
430	Ora-839	C	1	0-10	shell	Chione fluctifraga				2	
431	Ora-839	C	1	0-10	shell	Neverita reclusianus				2	
432	Ora-839	C	1	0-10	shell	Laevicardium sp.				1	
433	Ora-839	C	1	0-10	faunal	Myliobatis californica	tooth	burnt		1	
434	Ora-839	C	1	0-10	shell	Astraea undosa				tr.	
435	Ora-839	C	1	0-10	shell	Psuedochama exogyra				1	
436	Ora-839	C	1	0-10	shell	Gastropod				2	
437	Ora-839	C	1	0-10	shell	Ostrea lurida				1	
438	Ora-839	C	1	0-10	faunal	mammal	bone	2 burnt		4	
439	Ora-839	C	1	0-10	shell	Argopecten sp.				9	
440	Ora-839	C	1	0-10	lithic	debitage	flake	primary	andesite	1	8.8g
441	Ora-839	C	1	0-10	lithic	debitage	shatter		quartz	1	0.2g
442	Ora-839	C	1	0-10	lithic	debitage	shatter	tertiary	metavolcanic	2	13.5g
443	Ora-839	C	1	0-10	lithic	debitage	shatter		Monterey chert	2	2.1g
444	Ora-839	C	1	10-20c	shell	Chione spp.				19	
445	Ora-839	C	1	10-20c	shell	Chione californiensis				11	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
446	Ora-839	C	1	10-20c	shell	Chione undatella				6	
447	Ora-839	C	1	10-20c	shell	Neverita reclusianus				7	
448	Ora-839	C	1	10-20c	shell	Argopecten sp.				2	
449	Ora-839	C	1	10-20c	shell	Astraea undosa				3	
450	Ora-839	C	1	10-20c	shell	Psuedochama sp.				2	
451	Ora-839	C	1	10-20c	faunal	shark	calcified	cartilage		1	
452	Ora-839	C	1	10-20c	lithic	debitage	shatter	same?	quartzite	4	11.9g
453	Ora-839	C	1	20-30	shell	Chione californiensis				6	
454	Ora-839	C	1	20-30	shell	Chione undatella				7	
455	Ora-839	C	1	20-30	shell	Chione spp.				11	
456	Ora-839	C	1	20-30	shell	Neverita reclusianus				4	
457	Ora-839	C	1	20-30	shell	Pseudochama exogyra				5	
458	Ora-839	C	1	20-30	shell	Argopecten sp.				3	
459	Ora-839	C	1	20-30	shell	Astraea undosa				1	
460	Ora-839	C	1	20-30	faunal	mammal	bone	fragment		2	
461	Ora-839	C	1	20-30	lithic	debitage	secondary flake; shatter	battered	metavolcanic	2	17.9g
462	Ora-839	C	1	20-30	lithic	debitage	secondary flake; shatter	battered	metavolcanic	2	23.2g
463	Ora-839	C	1	30-40	shell	Chione californiensis				10	
464	Ora-839	C	1	30-40	shell	Chione undatella				5	
465	Ora-839	C	1	30-40		Chione spp.				25	
466	Ora-839	C	1	30-40	shell	Argopecten sp.				24	
467	Ora-839	C	1	30-40	shell	Neverita reclusianus				2	
468	Ora-839	C	1	30-40	shell	Psuedochama sp.				2	
469	Ora-839	C	1	30-40	shell	Astraea undosa				3	
470	Ora-839	C	1	30-40	shell	Crepidula sp.				2	
471	Ora-839	C	1	30-40	shell	Gastropod				1	
472	Ora-839	C	1	30-40	faunal	Myliobatis californica	tooth			2	
473	Ora-839	C	1	30-40	faunal	shark	centrum			1	
474	Ora-839	C	1	30-40	faunal	shark	centrum			1	
475	Ora-839	C	1	30-40	faunal	Porichthys myriaster	otolith			1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
476	Ora-839	C	1	30-40	faunal	mammal	bone	3 burnt		4	
477	Ora-839	C	1	30-40	lithic	debitage	flake	primary	metavolcanic	3	36.2g
478	Ora-839	C	1	30-40	lithic	debitage	secondary flake; shatter		Monterey chert	1	3.0g
479	Ora-839	C	1	30-40	lithic	debitage	flake	tertiary	metavolcanic	4	1.9g
480	Ora-839	C	1	30-40	shell	Chione californiensis			feature 1	1	
481	Ora-839	C	1	30-40	shell	Chione spp.			feature 1	1	
482	Ora-839	C	1	30-40	shell	Mytilus sp.			feature 1	trace	
483	Ora-839	C	1	30-40	shell	Argopecten sp.			feature 1	1	
484	Ora-839	C	1	30-40	shell	Gastropod			feature 1	1	
485	Ora-839	C	1	30-40	shell	Ostrea lurida			feature 1	1	
486	Ora-839	C	1	30-40	shell	Chione spp.	c-14 date		feature 1	1	
487	Ora-839	C	1	30-40	shell	Astraea undosa	c-14 date		feature 1	1	
488	Ora-839	C	1	40-50	shell	Chione californiensis				15	
489	Ora-839	C	1	40-50	shell	Chione fluctifraga				1	
490	Ora-839	C	1	40-50	shell	Chione undatella				6	
491	Ora-839	C	1	40-50	shell	Chione spp.				15	
492	Ora-839	C	1	40-50	shell	Psuedochama sp.				6	
493	Ora-839	C	1	40-50	shell	Saxidomus nuttali				2	
494	Ora-839	C	1	40-50	shell	Crepidula sp.				3	
495	Ora-839	C	1	40-50	shell	Anomia peruviana				1	
496	Ora-839	C	1	40-50	shell	Mytilus sp.				trace	
497	Ora-839	C	1	40-50	shell	Ostrea lurida				9	
498	Ora-839	C	1	40-50	shell	Argopecten sp.				28	
499	Ora-839	C	1	40-50	shell	Neverita reclusianus				6	
500	Ora-839	C	1	40-50	shell	Astraea undosa				3	
501	Ora-839	C	1	40-50	shell	Gastropod	columella			1	
502	Ora-839	C	1	40-50	faunal	Myliobatis californica	tooth			1	
503	Ora-839	C	1	40-50	faunal	Myliobatis californica	centrum	Fragment		1	
504	Ora-839	C	1	40-50	faunal	Triakidae	centrum	Fragment		1	
505	Ora-839	C	1	40-50	faunal	Myliobatis californica	centrum	fragment		1	
506	Ora-839	C	1	40-50	faunal	Myliobatis californica	centrum			1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
507	Ora-839	C	1	40-50	faunal	small mammal	longbone	fragment		1	
508	Ora-839	C	1	40-50	lithic	flake	tertiary		obsidian	1	1.0g
509	Ora-839	C	1	40-50	lithic	debitage	secondary		metavolcanic	1	14.6g
510	Ora-839	C	1	40-50	lithic	debitage	secondary flake; shatter		quartzite	1	17.1g
511	Ora-839	C	1	50-60	shell	Chione californiensis				3	
512	Ora-839	C	1	50-60	shell	Chione spp.				6	
513	Ora-839	C	1	50-60	shell	Argopecten sp.				19	
514	Ora-839	C	1	50-60	shell	Psuedochama sp.				4	
515	Ora-839	C	1	50-60	shell	Cerithidea sp.				1	
516	Ora-839	C	1	50-60	shell	Neverita reclusianus				1	
517	Ora-839	C	1	50-60	shell	Mytilus sp.				1	
518	Ora-839	C	1	50-60	shell	Crepidula sp.				1	
519	Ora-839	C	1	50-60	shell	Calyptraea sp.				1	
520	Ora-839	C	1	50-60	shell	Buccindae				1	
521	Ora-839	C	1	50-60	shell	Astraea undosa				2	
522	Ora-839	C	1	50-60	shell	Ostrea lurida				1	
523	Ora-839	C	1	50-60	shell	Gastropod				1	
524	Ora-839	C	1	50-60	shell	Anomia peruviana				1	
525	Ora-839	C	1	50-60	faunal	Myliobatis californica	teeth	burned		2	
526	Ora-839	C	1	50-60	faunal	Myliobatis californica	centrum			1	
527	Ora-839	C	1	50-60	faunal	Myliobatis californica	centrum			1	
528	Ora-839	C	1	50-60	faunal	Myliobatis californica	centrum			1	
529	Ora-839	C	1	50-60	faunal	bone				1	
530	Ora-839	C	1	50-60	faunal	mammal	bone frag	1 burned		3	
531	Ora-839	C	1	50-60	lithic	debitage	shatter		quartzite	1	0.4g
532	Ora-839	C	1	50-60	lithic	debitage	shatter		granitic	1	2.3g
533	Ora-839	C	1	60-70	shell	Chione undatella				3	
534	Ora-839	C	1	60-70	shell	Chione spp.				4	
535	Ora-839	C	1	60-70	shell	Calyptraea sp.				2	
536	Ora-839	C	1	60-70	shell	Argopecten sp.				9	
537	Ora-839	C	1	60-70	shell	Neverita reclusianus				1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
538	Ora-839	C	1	60-70	shell	Mytilus sp.				trace	
539	Ora-839	C	1	60-70	shell	Psuedochama sp.				1	
540	Ora-839	C	1	60-70	shell	Ostrea lurida				1	
541	Ora-839	C	1	60-70	shell	shark	centrum			1	
542	Ora-839	C	1	60-70	shell	Crepidula sp.				1	
543	Ora-839	C	1	60-70	shell	Astraea undosa				trace	
544	Ora-839	C	2	0-10	shell	Chione fluctifraga				1	
545	Ora-839	C	2	0-10	shell	Chione spp.				8	
546	Ora-839	C	2	0-10	shell	Argopecten sp.				3	
547	Ora-839	C	2	0-10	shell	Astraea undosa				1	
548	Ora-839	C	2	0-10	shell	Gastropod	columella			1	
549	Ora-839	C	2	0-10	shell	Crepidula sp.				1	
550	Ora-839	C	2	0-10	faunal	Myliobatis californica	centrum			1	
551	Ora-839	C	2	0-10	faunal	bone	fragments			1	
552	Ora-839	C	2	0-10	lithic	flake			obsidian	1	>0.1g
553	Ora-839	C	2	0-10	lithic	debitage	shatter		Monterey chert	2	13.5g
554	Ora-839	C	2	0-10	lithic	debitage	shatter		Quartz	1	8.8g
555	Ora-839	C	2	0-10	lithic	debitage	shatter		metavolcanic	1	0.7g
556	Ora-839	C	2	10-20c	shell	Chione spp.				15	
557	Ora-839	C	2	10-20c	shell	Chione californiensis				4	
558	Ora-839	C	2	10-20c	shell	Chione fluctifraga				3	
559	Ora-839	C	2	10-20c	shell	Argopecten sp.				5	
560	Ora-839	C	2	10-20c	shell	Neverita reclusianus				2	
561	Ora-839	C	2	10-20c	shell	Ostrea lurida				3	
562	Ora-839	C	2	10-20c	shell	Gastropod ?	columella			1	
563	Ora-839	C	2	10-20c	faunal	Myliobatis californica	tooth			1	
564	Ora-839	C	2	10-20c	faunal	Myliobatis californica	centrum			1	
565	Ora-839	C	2	10-20c	faunal	mammal	bone			1	
566	Ora-839	C	2	10-20c	glass	bottle	clear	fragment	w/bubbles	1	
567	Ora-839	C	2	10-20c	shell	Gastropod				1	
568	Ora-839	C	2	10-20c	lithic	debitage	shatter		Monterey chert	1	1.2g
569	Ora-839	C	2	10-20c	shell	Astraea undosa				1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
570	Ora-839	C	2	10-20c	lithic	debitage	shatter		metavolcanic	2	2.2g
571	Ora-839	C	2	10-20c	lithic	debitage	flake	secondary	metavolcanic	1	4.7g
572	Ora-839	C	2	20-30c	shell	Chione fluctifraga				1	
573	Ora-839	C	2	20-30c	shell	Chione spp.				21	
574	Ora-839	C	2	20-30c	shell	Chione undatella				4	
575	Ora-839	C	2	20-30c	shell	Argopecten sp.				6	
576	Ora-839	C	2	20-30c	shell	Saxodomus nuttali				1	
577	Ora-839	C	2	20-30c	shell	Neverita reclusianus				2	
578	Ora-839	C	2	20-30c	shell	Pseudochama exogyra				2	
579	Ora-839	C	2	20-30c	shell	Astraea undosa				3	
580	Ora-839	C	2	20-30c	faunal	Myliobatis californica	centrum			1	
581	Ora-839	C	2	20-30c	faunal	Myliobatis californica	centrum			1	
582	Ora-839	C	2	20-30c	faunal	Mammal	bone	1 burned		2	
583	Ora-839	C	2	20-30c	lithic	bi-face	scraper	core	monteray chert	1	243.0g
584	Ora-839	C	2	20-30c	lithic	debitage	flake	tertiary	montery chert	1	0.3g
585	Ora-839	C	2	20-30c	lithic	debitage	flake	secondary	montery chert	1	0.3g
586	Ora-839	C	2	20-30c	lithic	debitage	flake	tertiary	quartz	1	0.2g
587	Ora-839	C	2	20-30c	lithic	debitage	shatter		montery chert	1	0.6g
588	Ora-839	C	2	20-30c	lithic	debitage	shatter		metavolcanic	1	4.0g
589	Ora-839	C	2	30-40c	shell	Chione spp.				24	
590	Ora-839	C	2	30-40c	shell	Chione fluctifraga				2	
591	Ora-839	C	2	30-40c	shell	Chione undatella				9	
592	Ora-839	C	2	30-40c	shell	Chione californiensis				8	
593	Ora-839	C	2	30-40c	shell	Argopecten sp.				16	
594	Ora-839	C	2	30-40c	shell	Hinnites sp.				1	
595	Ora-839	C	2	30-40c	shell	Astraea undosa				2	
596	Ora-839	C	2	30-40c	shell	Neverita reclusianus				6	
597	Ora-839	C	2	30-40c	shell	Tegula sp.				1	
598	Ora-839	C	2	30-40c	shell	Psuedochama sp.				2	
599	Ora-839	C	2	30-40c	shell	Anomia peruviana				1	
600	Ora-839	C	2	30-40c	shell	Saxodomus nuttali				1	
601	Ora-839	C	2	30-40c	shell	Crepidula sp.				1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
602	Ora-839	C	2	30-40c	shell	Ostrea lurida				1	
603	Ora-839	C	2	30-40c	shell	shark	centrum frag			1	
604	Ora-839	C	2	30-40c	faunal	Mammal	bone frag			1	
605	Ora-839	C	2	40-50	shell	Chione spp.				20	
606	Ora-839	C	2	40-50	shell	Chione californiensis				13	
607	Ora-839	C	2	40-50	shell	Chione undatella				13	
608	Ora-839	C	2	40-50	shell	Chione fluctifraga				3	
609	Ora-839	C	2	40-50	shell	Neverita reclusianus				1	
610	Ora-839	C	2	40-50	shell	Saxidomus nuttali				trace	
611	Ora-839	C	2	40-50	shell	Crepidula sp.				4	
612	Ora-839	C	2	40-50	shell	Laevicardium sp.				trace	
613	Ora-839	C	2	40-50	shell	Cerithidea sp.				1	
614	Ora-839	C	2	40-50	shell	Psuedochama sp.				1	
615	Ora-839	C	2	40-50	shell	Astraea undosa				3	
616	Ora-839	C	2	40-50	shell	Ostrea lurida				11	
617	Ora-839	C	2	40-50	shell	Mytilus sp.				1	
618	Ora-839	C	2	40-50	faunal	bony fish	vertebra			1	
619	Ora-839	C	2	40-50	faunal	Rhinobatus productus	centrum			1	
620	Ora-839	C	2	40-50	shell	Argopecten sp.				18	
621	Ora-839	C	2	40-50	lithic	Red Ochre				1	
622	Ora-839	C	2	40-50	lithic	debitage			Montery Chert	1	2.7g
623	Ora-839	C	2	40-50	faunal	bone	mammal	burned		2	
624	Ora-839	C	2	40-50	lithic	PP/K	frag		montery chert	1	0.7g
625	Ora-839	C	2	40-50	lithic	debitage	shatter		Quartzite	1	8.1g
626	Ora-839	C	2	40-50	lithic	debitage	shatter		metavolcanic	2	26.2g
627	Ora-839	C	2	50-60	shell	Chione spp.				1	
628	Ora-839	C	2	50-60	shell	Chione undatella				1	
629	Ora-839	C	2	50-60	shell	Argopecten sp.				7	
630	Ora-839	C	2	50-60	shell	Ostrea lurida				2	
631	Ora-839	C	2	50-60	shell	Mytilus sp.				trace	
632	Ora-839	C	2	50-60	shell	Psuedochama sp.				1	
633	Ora-839	C	2	50-60	shell	Anomia peruviana				1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
634	Ora-839	C	2	50-60	shell	Astraea undosa				trace	
635	Ora-839	C	2	50-60	shell	Crepidula sp.				1	
636	Ora-839	C	2	50-60	shell	Calyptraea sp.				1	
637	Ora-839	C	2	50-60	lithic	debitage	shatter		metavolcanic	5	3.6g
638	Ora-839	C	2	50-60	lithic	debitage	shatter		Montery Chert	2	0.6
639	Ora-839	D	1	0-10	shell	Chione spp.				2	
640	Ora-839	D	1	0-10	shell	Neverita reclusianus				2	
641	Ora-839	D	1	0-10	shell	Conus californica				1	
642	Ora-839	D	1	0-10	shell	Argopecten sp.				1	
643	Ora-839	D	1	0-10	shell	Gastropod	columella			1	
644	Ora-839	D	1	10-20c	shell	Chione spp.				2	
645	Ora-839	D	1	10-20c	shell	Argopecten sp.				1	
646	Ora-839	D	1	10-20c	lithic	debitage	shatter		metavolcanic	2	1.9g
647	Ora-839	D	1	10-20c	shell	debitage	shatter		Quartzite	1	0.4g
648	Ora-839	D	1	20-30c	shell	Chione spp.				4	
649	Ora-839	D	1	20-30c	shell	Ceratostoma				1	
650	Ora-839	D	1	20-30c	lithic	debitage	shatter		Quartzite	1	1.2g
651	Ora-839	D	1	20-30c	lithic	debitage	shatter		metavolcanic	2	2.1g
652	Ora-839	D	1	30-40	shell	Chione spp.				1	
653	Ora-839	D	1	30-40	lithic	debitage	shatter	secondary	Quartzite	1	0.4g
654	Ora-839	D	1	40-50	shell	Chione spp.				1	
655	Ora-839	D	1	40-50	lithic	debitage	shatter	tertiary	Monterey chert	1	<0.1g
656	Ora-839	D	1	40-50	lithic	debitage	shatter		metavolcanic	2	0.69g
657	Ora-839	D	1	50-60	lithic	debitage	shatter		metavolcanic	1	0.2g
658	Ora-839	E	1	0-10c	shell	Chione spp.				7	
659	Ora-839	E	1	0-10c	shell	Argopecten sp.				3	
660	Ora-839	E	1	0-10c	shell	Ostrea lurida				9	
661	Ora-839	E	1	10-20c	shell	Chione spp.				16	
662	Ora-839	E	1	10-20c	shell	Chione undatella				2	
663	Ora-839	E	1	10-20c	shell	Chione californiensis				1	
664	Ora-839	E	1	10-20c	shell	Chione fluctifraga				3	
665	Ora-839	E	1	10-20c	shell	Ostrea lurida				1	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
666	Ora-839	E	1	10-20c	shell	Neverita reclusianus				1	
667	Ora-839	E	1	10-20c	shell	Argopecten sp.				5	
668	Ora-839	E	1	10-20c	shell	Astraea undosa				trace	
669	Ora-839	E	1	10-20c	faunal	Rabbit				1	
670	Ora-839	E	1	10-20c	lithic	debitage	shatter			2	6.1g
671	Ora-839	E	1	20-30	shell	Chione spp.				19	
672	Ora-839	E	1	20-30	shell	Chione californiensis				2	
673	Ora-839	E	1	20-30	shell	Chione undatella				1	
674	Ora-839	E	1	20-30	shell	Chione fluctifraga				1	
675	Ora-839	E	1	20-30	shell	Ostrea lurida				2	
676	Ora-839	E	1	20-30	shell	Argopecten sp.				7	
677	Ora-839	E	1	20-30	faunal	mammal	bone frag			2	
678	Ora-839	E	1	30-40	shell	Chione spp.				36	
679	Ora-839	E	1	30-40	shell	Chione californiensis				5	
680	Ora-839	E	1	30-40	shell	Chione fluctifraga				1	
681	Ora-839	E	1	30-40	shell	Neverita reclusianus				2	
682	Ora-839	E	1	30-40	shell	Argopecten sp.				5	
683	Ora-839	E	1	30-40	shell	Ostrea lurida				18	
684	Ora-839	E	1	30-40	shell	Crepidula sp.				1	
685	Ora-839	E	1	30-40	faunal	mammal	bone frag			3	
686	Ora-839	E	1	30-40	lithics	debitage	cubic shatter		metavolcanic	1	5.0g
687	Ora-839	E	1	40-50	shell	Chione spp.				21	
688	Ora-839	E	1	40-50	shell	Chione californiensis				2	
689	Ora-839	E	1	40-50	shell	Chione undatella				2	
690	Ora-839	E	1	40-50	shell	Ostrea lurida				18	
691	Ora-839	E	1	40-50	shell	Argopecten sp.				10	
692	Ora-839	E	1	40-50	shell	Astraea undosa				trace	
693	Ora-839	E	1	40-50	faunal	mammal	bone frag			4	
694	Ora-839	E	1	40-50	lithics	debitage	shatter			2	16.0g
695	Ora-839	E	1	50-60	shell	Chione spp.				18	
696	Ora-839	E	1	50-60	shell	Chione californiensis				3	
697	Ora-839	E	1	50-60	shell	Chione undatella				2	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
698	Ora-839	E	1	50-60	shell	Ostrea lurida				20	
699	Ora-839	E	1	50-60	shell	Argopecten sp.				14	
700	Ora-839	E	1	50-60	shell	Crepidula sp.				4	
701	Ora-839	E	1	50-60	shell	Astraea undosa				1	
702	Ora-839	E	1	50-60	shell	Cerithidea sp.				1	
703	Ora-839	E	1	60-70	shell	Chione spp.				14	
704	Ora-839	E	1	60-70	shell	Chione californiensis				1	
705	Ora-839	E	1	60-70	shell	Chione undatella				1	
706	Ora-839	E	1	60-70	shell	Chione fluctifraga				1	
707	Ora-839	E	1	60-70	shell	Argopecten sp.				13	
708	Ora-839	E	1	60-70	shell	Neverita reclusianus				1	
709	Ora-839	E	1	60-70	shell	Astraea undosa				trace	
710	Ora-839	E	1	60-70	shell	Ostrea lurida				16	
711	Ora-839	E	1	60-70	shell	Crepidula sp.				2	
712	Ora-839	E	1	70-80	shell	Chione spp.				19	
713	Ora-839	E	1	70-80	shell	Chione californiensis				1	
714	Ora-839	E	1	70-80	shell	Crepidula sp.				2	
715	Ora-839	E	1	70-80	shell	Ostrea lurida				21	
716	Ora-839	E	1	70-80	shell	Astraea undosa				trace	
717	Ora-839	E	1	70-80	shell	Gastropod				1	
718	Ora-839	E	1	70-80	lithic	debitage	cubic shatter		metavolcanic	3	26.6g
719	Ora-839	E	1	70-80	shell	Argopecten sp.				9	
720	Ora-839	E	1	80-90	shell	Chione spp.				17	
721	Ora-839	E	1	80-90	shell	Chione californiensis				2	
722	Ora-839	E	1	80-90	shell	Chione undatella				1	
723	Ora-839	E	1	80-90	shell	Ostrea lurida				47	
724	Ora-839	E	1	80-90	shell	Argopecten sp.				16	
725	Ora-839	E	1	80-90	shell	Crepidula sp.				15	
726	Ora-839	E	1	80-90	shell	Acmaea persona				1	
727	Ora-839	E	1	80-90	shell	Astraea undosa				trace	
728	Ora-839	E	1	80-90	lithic	debitage	cubic shatter			3	13.7g
729	Ora-839	E	1	90-100	shell	Chione spp.				15	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
730	Ora-839	E	1	90-100	shell	Chione undatella				2	
731	Ora-839	E	1	90-100	shell	Neverita reclusianus				2	
732	Ora-839	E	1	90-100	shell	Ostrea lurida				4	
733	Ora-839	E	1	90-100	shell	Crepidula sp.				2	
734	Ora-839	E	1	90-100	shell	Argopecten sp.				4	
735	Ora-839	E	1	90-100	lithic	debitage	cubic shatter			2	61.1g
736	Ora-839	E	1	100-sterile	shell	Chione spp.				2	
737	Ora-839	E	1	100-sterile	shell	Crepidula sp.				1	
738	Ora-844	B	1	10-20c	shell	Chione spp.				2	
739	Ora-844	B	1	10-20c	shell	Ostrea lurida				2	
740	Ora-844	B	1	10-20c	faunal	small mammal	bone frag			1	
741	Ora-844	B	1	20-30	shell	Chione spp.				6	
742	Ora-844	B	1	20-30	shell	Chione californiensis				1	
743	Ora-844	B	1	20-30	shell	Chione undatella				1	
744	Ora-844	B	1	20-30	shell	Ostrea lurida				9	
745	Ora-844	B	1	20-30	shell	Argopecten sp.				15	
746	Ora-844	B	1	20-30	shell	Neverita reclusianus				1	
747	Ora-844	B	1	20-30	shell	Astraea undosa				trace	
748	Ora-844	B	1	20-30	shell	Gastropod				2	
749	Ora-844	B	1	20-30	shell	Crepidula sp.				1	
750	Ora-844	B	1	20-30	shell	Ostrea lurida				1	
751	Ora-844	B	1	20-30	faunal	mammal	bone frag	burnt		1	
752	Ora-844	B	1	20-30	lithic	debitage	shatter			2	0.6g
753	Ora-844	B	1	30-40	shell	Chione spp.				16	
754	Ora-844	B	1	30-40	shell	Chione californiensis				2	
755	Ora-844	B	1	30-40	shell	Chione undatella				2	
756	Ora-844	B	1	30-40	shell	Gastropod				1	
757	Ora-844	B	1	30-40	shell	Cerithidea sp.				3	
758	Ora-844	B	1	30-40	shell	Ostrea lurida				134	
759	Ora-844	B	1	30-40	shell	Cerithidea sp.				24	

ORA-839 CATALOG
(Continued)

Catalog #	Site	Locus	Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
760	Ora-844	B	1	30-40	shell	Astraea undosa				6	
761	Ora-844	B	1	30-40	shell	Saxidomus nuttali				1	
762	Ora-844	B	1	30-40	shell	Argopecten sp.				68	
763	Ora-844	B	1	30-40	faunal	small mammal	bone frag			4	
764	Ora-844	B	1	30-40	lithic	debitage	shatter			1	0.4g
765	Ora-844	B	1	40-50	shell	Chione spp.				4	
766	Ora-844	B	1	40-50	shell	Chione californiensis				2	
767	Ora-844	B	1	40-50	shell	Chione undatella				2	
768	Ora-844	B	1	40-50	shell	Chione fluctifraga				1	
769	Ora-844	B	1	40-50	shell	Argopecten sp.				28	
770	Ora-844	B	1	40-50	shell	Ostrea lurida				64	
771	Ora-844	B	1	40-50	shell	Astraea undosa				1	
772	Ora-844	B	1	40-50	shell	Crepidula sp.				11	
773	Ora-844	B	1	40-50	faunal	Calyptraea sp.				2	
774	Ora-844	B	1	40-50	faunal	Myliobatis californica	centrum			1	
775	Ora-844	B	1	40-50	lithics	debitage	shatter		Montery Chert	2	0.5g
776	Ora-844	B	1	40-50	lithic	debitage	shatter		metavolcanic	1	0.2g
777	Ora-844	B	1	50-sterile	shell	Chione californiensis				1	
778	Ora-844	B	1	50-sterile	shell	Argopecten sp.				13	
779	Ora-844	B	1	50-sterile	shell	Calyptraea sp.				1	
780	Ora-844	B	1	50-sterile	shell	Crepidula sp.				4	
781	Ora-844	B	1	50-sterile	shell	Cerithidea sp.				1	
782	Ora-844	B	1	50-sterile	shell	Astraea undosa				trace	
783	Ora-844	B	1	50-sterile	shell	Ostrea lurida				12	
784	Ora-844	B	1	50-sterile	lithic	debitage	shatter			1	5.0g

ORA-906 CATALOG

Catalog #	Site	Level	Class	Genus	Species	Element	Side	Count	Comments
1	Ora-906	80-90	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
2	Ora-906	90-100	artifact	iron bolt				1	oil pipeline
3	Ora-906	90-100	faunal	*Hypsopsetta*	*guttulata*	caudal vertebra		1	diamond turbot
4	Ora-906	90-100	faunal	*Paralabrax*		caudal vertebra		1	bass
5	Ora-906	90-100	faunal	shark		centrum		1	
6	Ora-906	90-100	faunal	*Myliobatis*	*californica*	centrum		1	bat stingray
7	Ora-906	90-100	faunal	rodent		skull, incisor, rib		4	
7a	Ora-906	90-100	metal	lead	slug			1	
7b	Ora-906	90-100	faunal	bony fish		precaudal vertebra		1	
7c	Ora-906	90-100	faunal	shark		centrum frag.		1	
7d	Ora-906	90-100	faunal	small mammal		misc. bones		4	
8	Ora-906	90-100	shell	*Dentalium*		shell		1	
9	Ora-906	100-110	faunal	*Platyrhinoides*	*triseriata*	centrum		1	thornback
10	Ora-906	100-110	faunal	snake		vertebra		1	
11	Ora-906	100-110	faunal	Mammal		bone shaft		1	
12	Ora-906	100-110	faunal	bony fish		misc. bones		2	
13	Ora-906	110-120	faunal	*Rallus*	*longirostris*	tarsometatarsus		1	clapper rail
13a	Ora-906	110-120	faunal	*Paralichthys*	*californicus*	precaudal vertebra		1	Calif. Halibut
13b	Ora-906	110-120	faunal	bony fish		angular		1	
13c	Ora-906	110-120	faunal	*Myliobatis*	*californica*	tooth		1	bat stingray
13d	Ora-906	110-120	faunal	Triakididae		centrum		1	smoothhounds
13e	Ora-906	110-120	faunal	*Rhinobatos*	*productus*	centrum frag.		1	shovelnose guitarfish
13f	Ora-906	110-120	faunal	bony fish		bone		1	
13g	Ora-906	110-120	faunal	reptile		vertebra		2	
13h	Ora-906	110-120	faunal	rodent		incisor		1	
13i	Ora-906	110-120	faunal	small mammal		misc. bones		13	
13j	Ora-906	110-120	lithic	red orcher				1	4.7
13k	Ora-906	110-120	shell	small bead				1	
14	Ora-906	110-120	faunal	*Porichthys*		precaudal vertebra		1	
15	Ora-906	110-120	faunal	bony fish		caudal vertebra		1	
16	Ora-906	110-120	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish

ORA-906 CATALOG
(Continued)

Catalog #	Site	Level	Class	Genus	Species	Element	Side	Count	Comments
17	Ora-906	110-120	faunal	Triakididae		centrum		1	smoothhounds
18	Ora-906	110-120	faunal	Triakididae		centrum		1	smoothhounds
19	Ora-906	110-120	faunal	*Rallus*	*longirostris*	tarsometatarsus		1	clapper rail
20	Ora-906	110-120	faunal	gopher		lower jaw		1	
21	Ora-906	110-120	faunal	vertebrate		misc. bones		6	
22	Ora-906	120-130	faunal	Enhydra	lutris	dentary	R	1	locally extinct 1860
23	Ora-906	120-130	faunal	bird		cervical vertebra		1	
24	Ora-906	120-130	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
25	Ora-906	120-130	faunal	Mammal		bone end		1	
26	Ora-906	120-130	faunal	Mammal		bone fragments		2	
27	Ora-906	120-130	faunal	bird		vertebra		1	
28	Ora-906	120-130	shell	*Cerithidea*	*californicus*	shell		1	
29	Ora-906	120-130	faunal	bony fish		premaxilla frag.?		1	
30	Ora-906	130-140	faunal	*Phalacrocorax*	*auritus*	tibiotarsus		1	Double-crested cormorant
31	Ora-906	130-140	faunal	bird		vertebra		1	
32	Ora-906	130-140	faunal	bird		bone		1	
33	Ora-906	130-140	faunal	*Myliobatis*	*californica*	centrum		1	bat stingray
34	Ora-906	130-140	faunal	shark		centrum		1	
35	Ora-906	130-140	faunal	reptile		vertebra		1	
36	Ora-906	130-140	faunal	bony fish		vertebra		1	
37	Ora-906	130-140	faunal	*Hypsopsetta*	*guttulata*	precaudal vertebra		1	diamond turbot
38	Ora-906	130-140	faunal	Triakididae		centrum frag.		1	smoothhounds
39	Ora-906	130-140	faunal	Triakididae		centrum frag.		1	smoothhounds
40	Ora-906	130-140	faunal	*Hypsopsetta*	*guttulata*	caudal vertebra		1	diamond turbot
41	Ora-906	130-140	faunal	rodent		vertebra		1	
42	Ora-906	130-140	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
43	Ora-906	130-140	faunal	*Rhinobatos*	*productus*	centrum		1	burned
44	Ora-906	130-140	faunal	*Paralichthys*	*californicus*	precaudal vertebra		8	Calif. Halibut
45	Ora-906	130-140	faunal	*Porichthys*		precaudal vertebra		4	midshipmen
46	Ora-906	130-140	faunal	gopher		dentary		1	

ORA-906 CATALOG
(Continued)

Catalog #	Site	Level	Class	Genus	Species	Element	Side	Count	Comments
47	Ora-906	130-140	faunal	Mammal		misc. bones		27	
48	Ora-906	140-150	faunal	Mammal		bone shaft		1	poss. Bone tool cut marks
49	Ora-906	140-150	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
50	Ora-906	140-150	faunal	Triakididae		centrum		1	smoothhounds
51	Ora-906	140-150	faunal	Triakididae		centrum		1	smoothhounds
52	Ora-906	140-150	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
53	Ora-906	140-150	faunal	shark		centrum		1	burned
54	Ora-906	140-150	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
55	Ora-906	140-150	faunal	bony fish		centrum		1	
56	Ora-906	140-150	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
57	Ora-906	140-150	faunal	Triakidae		centrum		1	
58	Ora-906	140-150	faunal	bony fish		vertebra		1	very small fish
59	Ora-906	140-150	faunal	Clupeidae		vertebra		1	very small fish
60	Ora-906	140-150	faunal	bony fish		precaudal vertebra		1	
61	Ora-906	140-150	faunal	*Paralichthys*	*californicus*	caudal vertebra		1	Calif. Halibut
62	Ora-906	140-150	faunal	*Paralichthys*	*californicus*	caudal vertebra		1	Calif. Halibut
63	Ora-906	140-150	faunal	bony fish		caudal vertebra		1	Embiotocid?
64	Ora-906	140-150	faunal	Porichthys		precaudal vertebra		2	midshipman
65	Ora-906	140-150	faunal	Porichthys		caudal vertebra		2	midshipman
66	Ora-906	140-150	faunal	*Hypsopsetta*	*guttulata*	precaudal vertebra		1	diamond turbot
67	Ora-906	140-150	faunal	bony fish		basioccipital		1	
68	Ora-906	140-150	faunal	bony fish		bone		1	
69	Ora-906	140-150	faunal	bony fish		precaudal vertebra		1	small fish
70	Ora-906	140-150	faunal	bird		vertebra		1	
71	Ora-906	140-150	faunal	*Oxyura*	*cf. O. jamaicensis*	femur		1	ruddy? Duck
72	Ora-906	140-150	faunal	reptile		vertebra		2	
73	Ora-906	140-150	faunal	bird		phalanx		1	

ORA-906 CATALOG
(Continued)

Catalog #	Site	Level	Class	Genus	Species	Element	Side	Count	Comments
74	Ora-906	140-150	faunal	vertebrates		misc. bone frags		28	
75	Ora-906	140-150	faunal	bony fish		misc. bone frags		7	
76	Ora-906	140-150	faunal	rodent		tooth		5	
77	Ora-906	140-150	faunal	*Hypsopsetta*	*guttulata*	vertebra		1	diamond turbot
78	Ora-906	150-160	faunal	Triakididae		centrum		1	smoothhounds
79	Ora-906	150-160	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
80	Ora-906	150-160	faunal	Triakididae		centrum		1	smoothhounds
81	Ora-906	150-160	faunal	Triakididae		centrum		1	smoothhounds
82	Ora-906	150-160	faunal	Triakididae		centrum		1	smoothhounds
83	Ora-906	150-160	faunal	*Anas*	*cf. A. acuta*	coracoid		1	northern pintail
84	Ora-906	150-160	shell	shell		with asphaltum		1	tool?
85	Ora-906	150-160	faunal	*Branta*	*cf. B. canadensisi*	tibiotarsus and ulna		3	Canada gpose
86	Ora-906	150-160	faunal	mammal		occipital		1	
87	Ora-906	150-160	faunal	mammal		skull-otic? Region		1	large mammal
88	Ora-906	150-160	faunal	mammal		long bone		1	large mammal
89	Ora-906	150-160	faunal	rodent		skull		2	
90	Ora-906	150-160	faunal	*Anas*	*cf. A. crecca*	femur		1	green-winged teal
91	Ora-906	150-160	faunal	bird		radius		1	
92	Ora-906	150-160	faunal	vertebrates		misc. bone frags		4	
93	Ora-906	160-170	faunal	*Paralichthys*	*californicus*	precaudal vertebra		1	Calif. Halibut
94	Ora-906	160-170	faunal	*Porichthys*		precaudal vertebra		1	midshipman
95	Ora-906	160-170	faunal	*Anas*	*cf. A. acuta*	furcula		1	northern pintail
96	Ora-906	160-170	faunal	*Melanitta*	*perspicillata*	carpometacarpus		1	surf scoter
97	Ora-906	160-170	faunal	*Fulica*	*americana*	tibiotarsus?		1	American coot
98	Ora-906	160-170	faunal	*Fulica*	*americana*	phalanx		1	American coot
99	Ora-906	160-170	faunal	*Chen*	*cf. C. cerulescens*	pelvis		1	snow goose
100	Ora-906	160-170	faunal	frog		pelvis?		1	
101	Ora-906	160-170	faunal	vertebrates		misc. bone frags		5	
102	Ora-906	160-170	faunal	bird		bone		1	

ORA-906 CATALOG
(Continued)

Catalog #	Site	Level	Class	Genus	Species	Element	Side	Count	Comments
103	Ora-906	170-180	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
104	Ora-906	170-180	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
105	Ora-906	170-180	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
106	Ora-906	170-180	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
107	Ora-906	17**0-180**	faunal	Triakidae		centrum		1	
108	Ora-906	170-180	faunal	*Paralichthys*	*californicus*	precaudal vertebra		1	Calif. Halibut
109	Ora-906	170-180	faunal	*Porichthys*		caudal vertebra		1	midshipman
110	Ora-906	170-180	faunal	bony fish		precaudal vertebra		1	
111	Ora-906	170-180	faunal	*Porichthys*		cleithrum?		1	
112	Ora-906	170-180	faunal	*Pelecanus*	*occidentalsi*	coracoid		1	brown pelican
113	Ora-906	170-180	faunal	bird		vertebra		1	
114	Ora-906	170-180	faunal	*Anas*	*cf. A. acuta*	coracoid		1	northern pintail
115	Ora-906	17**0-180**	faunal	*Anas*	*cf. A. crecca*	coracoid		1	green-winged teal
116	Ora-906	170-180	faunal	*Melanitta*	*perspicillata*	tibiotarsus?		1	surf scoter
117	Ora-906	170-180	faunal	*Branta*	*cf. B. canadensisi*	femur		1	Canada gpose
118	Ora-906	170-180	faunal	*Anas*	*cf. A. crecca*	sterum		1	green-winged teal
119	Ora-906	170-180	faunal	mammal		pelvis		1	
120	Ora-906	170-180	faunal	*Anas*	*cf. A. acuta*	scapula		1	
121	Ora-906	17**0-180**	faunal	frog		pelvis		1	
122	Ora-906	170-180	faunal	snake		vertebra		1	
123	Ora-906	170-180	faunal	frog		bone		1	
`124	Ora-906	170-180	faunal	mammal		bone frag.		1	
125	Ora-906	170-180	faunal	mammal		misc. bone frags		7	
126	Ora-906	170-180	faunal	small mammal		caudal vertebra		1	
127	Ora-906	170-180	faunal	mammal		rib		1	
128	Ora-906	180-260	faunal	*Branta*	*cf. B. canadensisi*	bone		1	Canada gpose
129	Ora-906	180-260	faunal	*Anas*	*cf. A. cyanoptera*	humerus		1	cinnamon teal

ORA-906 CATALOG
(Continued)

Catalog #	Site	Level	Class	Genus	Species	Element	Side	Count	Comments
130	Ora-906	180-260	faunal	*Aechmophorus*	*cf. A. occidentalis*	humerus		1	Western or Clark's Grebe
131	Ora-906	180-260	faunal	*Anas*	*cf. A. clypeata*	sternum		1	Northern Shoveler
132	Ora-906	180-260	faunal	bird		?		1	
133	Ora-906	180-260	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
134	Ora-906	180-260	faunal	Triakidae		centrum		1	smoothhounds
135	Ora-906	180-260	faunal	*Rhinobatos*	*productus*	centrum		2	shovelnose guitarfish
136	Ora-906	180-260	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
137	Ora-906	180-260	faunal	*Rhinobatos*	*productus*	centrum frag.		1	shovelnose guitarfish
138	Ora-906	180-260	faunal	*Rhinobatos*	*productus*	centrum		1	shovelnose guitarfish
139	Ora-906	180-260	faunal	Triakididae		centrum		1	smoothhounds
140	Ora-906	180-260	faunal	Triakididae		centrum		1	smoothhounds
141	Ora-906	180-260	faunal	Triakididae		centrum		1	smoothhounds
142	Ora-906	180-260	faunal	Triakididae		centrum frag.		1	smoothhounds
143	Ora-906	180-260	faunal	bony fish		vertebra		1	
144	Ora-906	180-260	faunal	bony fish		bone		2	
145	Ora-906	180-260	faunal	lg. cat or dog		metatarsal?		1	
146	Ora-906	180-260	faunal	Mammal		phalanx		1	
147	Ora-906	180-260	faunal	Mammal?		pelvis		1	
148	Ora-906	180-260	faunal	Mammal		rib		1	
149	Ora-906	180-260	faunal	Vertebrate		misc bone fr.		10	

HISTORY

Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
	surface	glass	milk glass	embossed: "E-CAYA" on side and "JAMES C CRANE NEW YORK" on base	cosmetic jar	fire affected	1	156.0 g
	surface	glass	amethyst	hand tooled "flared" finish	bottle finish		1	26.9g
	surface	glass	aqua	embossed: "LE…." along side	bottle base		1	16.3g
	surface	ceramic	white ware	embossed: along base	bowl base		1	20.5g
	surface	glass	amethyst	rolled or folded-in/out "bead" finish	bottle finish	fire affected	1	9.4g
	surface	glass	clear	embossed below hand tooled "prescription" finish	bottle finish		1	35.1g
	surface	glass	clear	hand tooled "prescription" finish	bottle finish		1	26.1g
	surface	glass	clear	hand tooled "crown cap" finish	bottle finish		1	31.6g
	surface	glass	green	hand tooled "crown cap" finish	bottle finish		1	26.1g
	surface	glass	aqua	emdossed "B" (…all) in print and in script	canning jar body	fire affected	1	14.1g
	surface	glass	amethyst	blown in (cup) mold	bottle base		1	66.4g
	surface	glass	aqua	lightning type jar closure	canning jar finish		1	40.6g
	surface	glass	aqua	semi-automatic/ABM scar on base	canning jar base		1	33.3g
	surface	glass	clear	straight brandy or wine finish	bottle finish		1	48.6g
	surface	glass	amethyst	straight brandy or wine finish ABM	bottle finish		1	31.4g
	surface	glass	amethyst	MM, "B" with extended serifs, (BrockawayGlass Co.)	whiskey bottle base		1	34.9g
	surface	glass	amethyst	oval base	bottle base		1	21.3G
	surface	glass	clear	embossed "CALI..", "F"	panel body frag		1	12.8g
	surface	glass	amethyst	embossed "…3 G.Co." with irregular polygon base	bottle base		1	19.9g
	surface	ceramic	stoneware	salt glazed	crock body fragment		1	7.3g
	surface	ceramic	white ware	shell edged, embossed with transfer printed under glaze	rim sherd		1	36.2g
	surface	ceramic	porcelain	undecorated	3 1/2" dia. base		1	16.0g
	surface	ceramic	stoneware	undecorated	6 1/2" dia. Base		1	64.2g
	surface	glass	milk glass	2" dia.	canning jar liner		1	13.0g
	surface	glass	amethyst	"flat or patent" finish	bottle finish	fire affected	1	21.2g
	surface	glass	amber	blob top finish	bottle finish		1	4.7g
	surface	glass	clear	"flat or patent" finish	bottle finish		1	46.4
	surface	glass	clear	small mouth external thread finish	bottle finish		1	25.6

HISTORY
(Continued)

Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
	surface	glass	clear	bead finish (medicinal)	bottle finish		1	8.2g
	surface	glass	clear	small mouth external thread finish	bottle finish		1	25.4g
	surface	glass	clear	stretch marks on neck	bottle neck		1	12.9g
	surface	glass	amethyst	drinking glass with fluted base	glass base		1	20.2g
	surface	glass	clear	base fragment	round base		1	11.3g
	surface	glass	amber	embossed "D. MEINKE…" …AN FR…"	body fragment		1	41.8g
	surface	glass	clear	medicinal panal embossed "…A . SLO…"; "…MOND PHA…" with increments along sidebody	body fragment		1	8.5g
	surface	glass	clear	oval pressed glassbase w/ star burst design	pickle/relish dish		1	29.9g
	surface	glass	amethyst	large serving platter	rim sherd		2	123.2g
	surface	glass	clear	window pane	pane fragment		1	8.9g
	surface	bone	mammal	2" long, machine cut	long bone		1	4.1g
	surface	construction	ceramic	household insulator embossed "…P.P.INC. 5…"; "ALL…"	ceramic insulator		1	121.5g
	surface	ceramic	white ware	shell edged, embossed along edge	rim sherd		2	19.7g
	surface	ceramic	stoneware	flat	base fragment		1	10.4g
	surface	ceramic	semi-porcelain	shell edged embossed	rim sherd		1	5.0g
	surface	ceramic	white ware	shell edged embossed	rim sherd		1	11.8
	surface	ceramic	white ware	flo blue	base fragment		1	17.9g
	suface	ceramic	porcelain	red transferware	teacup handel		1	8.0g
	surface	ceramic	porcelain	green handpainted underglaze	body fragment		1	4.8g
	surface	ceramic	earthenware	"VIENNA…"	body fragment		1	5.5g
	surface	ceramic	white ware	flo blue	body fragment	fire affected	1	5.0g
	surface	ceramic	Ironstone	Tea leaf pattern transferware	"Anthony Shaw England"		1	8.1g
	surface	ceramic	white ware	blue embossed rim	rim sherd		1	1.6g
STP#1	0-20cm	glass	clear	misc. undiagnostic fragments	bottle glass		10	57.1g
STP#1	0-20cm	glass	clear	misc. undiagnostic fragments	bottle glass	fire affected	6	62.0g
STP#1	0-20cm	glass	amethyst	body fragment	bottle glass	fire affected	1	5.5g
STP#1	0-20cm	glass	clear	embossed "DR…", medicinal panel	bottle glass		1	10.g`

HISTORY
(Continued)

Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
STP#1	0-20cm	glass	clear	bead finish	bottle glass		1	15.2g
STP#1	0-20cm	glass	amber	misc. undiagnostic fragments	bottle glass		6	23.1
STP#1	0-20cm	glass	cobalt	body fragment	bottle glass		1	1.4g
STP#1	0-20cm	glass	aqua	finish	bottle glass	fire affected	1	6.3g
STP#1	0-20cm	glass	olive	body fragment	bottle glass		1	3.9g
STP#1	0-20cm	glass	light green	thick body frag	bottle glass		1	7.7g
STP#1	0-20cm	glass	clear	bead finish	bottle finish		2	14.9g
STP#1	0-20cm	glass	clear	window pane	flat glass		2	3.9g
STP#1	0-20cm	glass	clear	condimint	bottle glass		2	13.6g
STP#1	0-20cm	glass	clear	thin glass	lamp chimmney		2	1.2g
STP#1	0-20cm	metal	steel	fastener	garter		1	2.0g
STP#1	0-20cm	construction	brick	brick	brick		1	4.6
STP#1	0-20cm	ceramic	white ware	bowl	rim and base		4	29.1g
STP#1	0-20cm	ceramic	porcelain	bowl	rim and base		1	12.4g
STP#1	0-20cm	ceramic	porcelain	body fragment			1	5.9g
STP#1	20-40cm	ceramic	white ware	"Maastricht Pottery C0" "ABBY" Transferware	Flo Blue		1	41.3g
STP#1	20-40cm	ceramic	white ware	misc. bowl fragments	rim and base		4	19.7
STP#1	20-40cm	bone	mammal	femur	proximal portion	broken	1	22.0g
STP#1	20-40cm	bone	mammal	rib and cut long bone	small sections	saw cut	2	3.4g
STP#1	20-40cm	bone	mammal	rib section		fire affected	1	1.5g
STP#1	20-40cm	glass	clear	misc. undiagnostic fragments	bottle	opalized	6	23.7g
STP#1	20-40cm	glass	olive	body fragment	bottle	bubbles	1	7.0g
STP#1	20-40cm	glass	aqua	misc. undiagnostic fragments	bottle	some opalized	4	13.1g
STP#1	20-40cm	glass	amber	undiagnostic fragment	bottle		1	2.4
STP#1	20-40cm	glass	clear	flat glass	window pane		3	3.4g
STP#1	20-40cm	glass	light olive	undiagniostic fragment	bottle		1	1.9g
STP#1	20-40cm	glass	clear	faux pearl jewelry	hatpin		1	.4g
STP#1	20-40cm	ceramic	porcelain	misc. undiagnostic fragments			3	1.7g
STP#1	20-40cm	ceramic	porcelain	hand painted	teacup		1	1.8g
STP#1	20-40cm	metal	nail	wire nail			1	2.5g
STP#1	40-60cm	glass	olive	applied or champagne finish	bottle finish	opalized	1	39.7g

HISTORY
(Continued)

Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
STP#1	40-60cm	glass	clear	flared finish	bottle finish	opalized	1	26.8g
STP#1	40-60cm	glass	amber	pontil scar; "black glass"	base fragment		3	61.6g
STP#1	40-60-cm	glass	amber	embossed "35"; "B" w/pontil scar	base fragment	"black glass"	2	38.0g
STP#1	40-60-cm	construction	ceramic	insulator	frament		1	41.6
STP#1	40-60-cm	glass	amber	embossed "…A…"	body fragment		2	5.7g
STP#1	40-60-cm	glass	olive	wine bottle	neck fragment		3	25.3g
STP#1	40-60-cm	glass	milk glass	Embossed "...Y D…"	canning lid		1	1.3g
STP#1	40-60-cm	glass	amber	Beer bottle fragments	body fragment		5	20.8g
STP#1	40-60-cm	glass	clear	wine/brandy finish	finish frament		3	20.5g
STP#1	40-60-cm	glass	aqua	misc. undiagnostic fragments	body fragment		5	13.6g
STP#1	40-60-cm	glass	clear	misc. undiagnostic fragments	body fragment	opalized	14	50.3g
STP#1	40-60-cm	bone	mammal	talus	cow?		1	134.0g
STP#1	40-60-cm	bone	mammal	long bone	small animal		3	5.6g
STP#1	40-60-cm	bone	mammal	long bone ?	articulating surface	fire affected	1	1.8g
STP#1	40-60-cm	metal	nails	wire nails	4 heads	oxidized	11	29.1g
STP#1	40-60-cm	metal	screw	large thread	no head	oxidized	1	5.0g
STP#1	40-60-cm	metal	copper	wire	bare	oxidized	2	1.4g
STP#1	40-60-cm	metal	misc. metal	hinge bracket	partial	oxidized	1	73.9g
STP#1	40-60-cm	metal	misc. metal	container with cap	partial	oxidized	1	67.8g
STP#1	40-60-cm	metal	misc. metal	roller w/ bearings	4.2"x 1.8"	oxidized	1	403.8g
STP#1	40-60-cm	metal	misc. metal	misc. undiagnostic fragments		oxidized	26	312.1g
STP#1	40-60-cm	shell	barnacle				1	1.2
STP#1	40-60-cm	ceramic	stoneware	salt glazed	crock body fragment		5	35.2g
STP#1	40-60-cm	ceramic	Ironstone	Tea leaf pattern transferware	"Anthony Shaw England"		1	9.9g
STP#1	40-60-cm	ceramic	white ware	bowl fragments		fire affected	17	80.3g
STP#1	40-60-cm	ceramic	white ware	embossed beaded rim	rim sherd		1	3.7g
STP#1	40-60-cm	construction	plaster	material imprint on both surfaces	wall covering		1	3.9.g
STP#1	40-60-cm	shell	mytilus	black mussel		fire affected?	1	1.6g
STP#1	60-80cm	glass	aqua	UID	slag	fire affected	2	27.0g
STP#1	60-80cm	glass	clear	UID	opalized	fire affected	1	1.2g

HISTORY
(Continued)

Unit	Level	Class	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Count	Wt.
STP#1	60-80cm	bone	mammal	UID		fire affected	1	1.2g
STP#1	60-80cm	construction	copper	wire			1	.6g
STP#1	60-80cm	construction	copper	screen fragments			3	.3g
STP#1	60-80cm	metal	nail	large wire nail w/ charcoal attached		fire affected	1	12.5g
STP#1	60-80cm	metal	misc. metal	misc. undiagnostic fragments		oxidized	19	51.6g
STP#1	60-80cm	metal	nail	wire nail fragments	2 heads	oxidized	2	1.1g
STP#1	60-80cm	glass	UID	slag		fire affected	1	.4g
STP#1	60-80cm	construction	Plaster	material imprint on both surfaces	wood imbeded	fire affected	2	1.7g