CCGS LLC
PO Box 1690
Danville, CA 94526

May 31, 2011

Mr. Craig Hoffman, CPM
(09-AFC-4C)
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

SUBJECT: Oakley Generating Station (09-AFC-4C)
CUL-3 Revised Cultural Resources Monitoring and Mitigation Plan (CRMMP)

Dear Mr. Hoffman:

Please find attached the revised Cultural Resources Monitoring and Mitigation Plan (CRMMP) for the Oakley Generating Station (OGS). The document incorporates CEC Staff's comments received on May 6, 2011, in accordance with Condition of Certification CUL-3.

If you have any questions regarding this submittal, please do not hesitate to contact me at (916) 799-9463 or Doug Davy at (916) 286-0278.

Sincerely,

Greg Lamberg
CCGS LLC
Senior Vice President

Attachment: Revised CRMMP – May 2011 (09-AFC-4C)

cc: Jim McLucas, CCGS LLC
Doug Davy, CH2M HILL

APPLICATION FOR CERTIFICATION

Cultural Resources Monitoring and Mitigation Plan

CUL-3

Oakley Generating Station

09-AFC-4C

May 2011

Submitted by

CCGS LLC

Submitted to

California Energy Commission

With Technical Assistance by

CH2MHILL

IS01201022315 1SAC

CUL-3

Cultural Resources Monitoring and Mitigation Plan

for the

Oakley Generating Station

(09-AFC-4C)

Prepared for

CCGS LLC

May 2011

Prepared by
Clint Helton, RPA
Designated Cultural Resources Specialist

CH2MHILL

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Contents

Appendices

Tables

Figure

Acronyms and Abbreviations

AFC	Application for Certification
ARMR	Archaeological Resource Management Report
ATSF	Atchison, Topeka, Santa Fe railroad
BNSF	Burlington Northern Santa Fe railroad
CCGS LLC	Contra Costa Generating Station, LLC
CCTS	Central California Taxonomic System
CEC	California Energy Commission
CFCs	chlorofluorocarbons
CHRIS	California Historical Resources Information System
COC	Conditions of Certification
CPM	Compliance Project Manager
CRHR	California Register of Historical Resources
CRM	Cultural Resource Monitor
CRMMP	Cultural Resources Mitigation and Monitoring Plan
CRR	Cultural Resources Report
CRS	Cultural Resources Specialist
CTG	combustion turbine-generator
FSA	Final Staff Assessment
GE	General Electric
HRSG	heat recovery steam generator
kV	kilovolt(s)
MCR	monthly compliance report
MLD	Most Likely Descendent(s)
MW	megawatt(s)
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places

OGS	Oakley Generating Station Project
PG&E	Pacific Gas and Electric Company
PRC	Public Resources Code
PRM	Paleontological Resources Monitor
ROW	right-of-way
SHPO	the State Historic Preservation Officer
SPRR	Southern Pacific Railroad
STG	steam turbine generator
TEL	tetraethyl lead
USGS	U.S. Geological Survey
WEAP	Worker Environmental Awareness Program

SECTION 1

Introduction

This Cultural Resources Mitigation and Monitoring Plan (CRMMP) explains how Contra Costa Generating Station, LLC (CCGS LLC) and the Cultural Resources Specialist (CRS) will comply with and implement the California Energy Commission's (CEC) cultural resources Conditions of Certification (COC) for the Oakley Generating Station Project (OGS or project). The CRMMP provides procedures to be followed to avoid or, if avoidance is not possible, reduce to a less-than-significant level the potential impacts of the project on potential archaeological resources discovered during construction-related excavation activities. The measures to be implemented would include the following:

- Teaching workers to recognize cultural resources
- Specific measures to avoid or minimize impacts on cultural resources (flagging, monitoring, etc.)
- Prescribed actions to be taken in the event that unanticipated cultural materials are discovered during construction, or known resources are affected in an unanticipated manner
- Treatment protocols for any cultural resources that may be exposed during project construction
- Treatment of any discovered human remains in accordance with state law

The CRMMP is prepared to fulfill CUL-3 of the CEC's cultural resources COCs, which are set forth in the Presiding Member's Proposed Decision (PMPD), and are attached as Appendix A to this CRMMP. The purpose of the CRMMP is to lay out a detailed program of mitigation for direct and indirect impacts on cultural resources during all ground-disturbing phases (including but not limited to preconstruction site mobilization; construction ground disturbance; construction grading, boring, and trenching; construction; and landscaping and maintenance). The CRMMP's program provides for the avoidance,identification, evaluation, treatment, and protection of any cultural resources that are affected by or may be discovered during the construction of the power plant and the associated linear facilities (Figure 1). Cultural resources are defined as anything made or affected by human beings or the remains thereof, as well as human remains. For the purposes of this CRMMP, the terms "finds," "cultural resource," "cultural material," "discovery," and "cultural resource materials" are used interchangeably. Types of cultural resources will be consistent with California Code of Regulations, Title 14, Chapter 11.5, section 4852(a), including archaeological and historical objects, sites and districts, historic buildings and structures, cultural landscapes, and sites and resources of concern to local Native American or other ethnic groups.

The CRMMP includes the following information:

- Description of the project, associated linear routes, adjacent areas, and ancillary areas
- Summary of known cultural resources in and immediately adjacent to the project or cultural resources that might be affected by the project, including all cultural resources that CEC staff identified in the PMPD , and a map showing the cultural resources in relation to the project and appurtenant facilities
- Research design tailored to the local environment, prehistory, and history, pursuant to *Guidelines for Archaeological Research Designs*, (California Office of Historic Preservation, 1991)
- Monitoring plan to be employed throughout the subsurface construction of OGS and its linear facilities, including protocols to be followed during routine monitoring and during discovery situations, where and when Native American observers may be required, and agency reporting requirements (reductions in planned monitoring to be subject to Compliance Project Manager [CPM] approval)
- Description of all avoidance measures such as flagging or fencing and the timeframes during which these measures would be required to protect cultural resources
- Statement of recording procedures for newly discovered cultural resources
- Statement of policy for the collection, retention, and disposal of cultural materials and archaeological records
- Statement that all cultural materials retained will be prepared in accordance with the requirements of a qualified curatorial facility and that the project owner will encumber all associated expenses for the curation of the materials at Sonoma State University David A. Fredrickson Archaeological Collections Facility (707-664-2381). (A written agreement with Sonoma State is provided in Appendix E.)
- Statement that the CRS has access to or ability to provide equipment and supplies necessary for mapping, photography, and recovery of any cultural resources that may be discovered
- Reporting requirements, if cultural materials are discovered

Any discussion, summary, or paraphrasing of the COCs in this CRMMP is intended as general guidance and as an aid to the user in understanding the COCs and their implementation. The COCs, as written in the PMPD, will supersede any summarization, description, or interpretation of the COCs in the CRMMP. The cultural resources COCs, set forth in the PMPD, are contained in Appendix A.

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

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FIGURE 1-1
PROJECT LOCATION
Oakley Generating Station
Oakley, California

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SECTION 2

Project and Area Description

The project will be a natural-gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 624 megawatts (MW).

The project will include the following principal elements:

- Two General Electric (GE) Frame 7FA combustion turbine-generators (CTG), with a nominal rating of 213 MW each, equipped with metallurgical enhancements to improve efficiency
- A single condensing steam turbine generator (STG)
- Heat recovery steam generators (HRSG) of the horizontal, natural circulation type
- A 230-kilovolt (kV) onsite switchyard to deliver the project's power directly to the grid through a 2.4-mile-long, single-circuit, 230-kV transmission line that will connect the project site with the Pacific Gas and Electric Company (PG&E) Contra Costa Substation
- Direct connection with the adjacent PG&E Antioch natural gas terminal for natural gas supply
- Connection to an existing onsite potable water line
- Connection to an existing onsite sanitary sewer pipeline

The project site is in Contra Costa County near the junction of Highway 4 and Highway 160 in Oakley, California, in Township 2N, Range 3E, Section 22 (Jersey Island). Primary access to the project site will be provided via a new entrance lane extending from Bridgehead Road, just south of the intersection of Bridgehead Road and Wilbur Avenue.

The proposed facility is bounded in the west by PG&E's Antioch natural gas terminal, a large natural gas transmission hub, to the north by DuPont property that is either industrial or vacant industrial, to the east by DuPont's titanium dioxide landfill area, and to the south by the Atchison, Topeka and Santa Fe railroad. Immediately south of the railroad is a large parcel currently used for agriculture. The proposed facility is located on a 21.95-acre parcel that is part of DuPont's 210-acre property. The project parcel is in an area of active vineyard agriculture with a central cluster of oak trees. The project parcel is bordered to the north by a narrow row of mature eucalyptus trees that separates the project parcel from the rest of the former DuPont manufacturing site.

Construction laydown and parking areas will be within existing site boundaries, on a 20-acre parcel east of the plant site. Construction access will generally be from two locations along Bridgehead Road. Most of the surface area for the access roads will be the existing paved surfaces on the former DuPont facility. However, the unpaved access roads will be stabilized using coarse aggregate. Large or heavy equipment, such as the turbines, generators, step-up transformers, and HRSG modules will be delivered by rail to the existing rail siding located on the project site. Other materials and equipment will be

delivered by truck. Three areas north of the OGS site are proposed for temporary stockpiling of soil associated with the project.

A 230-kV electrical transmission line will replace an existing 60-kV transmission line that runs approximately 2.4 miles south and west from OGS to the PG&E Contra Costa Substation. The new 230-kV transmission line would require the replacement of 17 existing steel-lattice towers with 20 tubular steel poles, and the extension of one existing 230-kV transmission tower. The right-of-way (ROW) for the existing transmission line is 80 feet wide. Boring and installation of 16-square-foot concrete foundations at each of the new tower locations will be required to provide subsurface support for the steel poles. It is assumed that the construction activities at each site will be limited to an 80 foot by 80 foot area. However, CCGS, LLC has mitigated temporary impacts for the entire existing 80-foot ROW to provide flexibility for the final installation design.

Therefore, it is conservatively assumed that the installation of the new transmission line will affect up to 22.5 acres of transmission line ROW.

Natural gas for the facility will be delivered via direct connection with the adjacent PG&E Antioch natural gas terminal for natural gas supply. The OGS will use potable water provided by the Diablo Water District for process and potable uses. The project will access this water through a tap from an existing 27-inch-diameter distribution pipeline that runs north-south through the OGS site (just east of PG&E's Antioch natural gas terminal). On an average annual basis, the total water use is estimated to be approximately 240 acre-feet per year.

A new sanitary sewer force main will be constructed in the Bridgehead Road and Main Street ROWs. The sanitary sewer force main will extend south along Bridgehead Road from a point adjacent to the plant entrance road for 0.33 mile to Main Street. It will then turn eastward and run for 0.11 mile to the interconnection point with the existing Ironhouse Sanitary District gravity main.

SECTION 3

Project Implementation Sequence and Schedule

This section describes the sequence of project-related tasks. Table 1 provides a schedule of all project-related tasks, including pre-construction, construction, and post-construction tasks. The tasks in Table 1 are listed in the approximate sequence in which they will occur and give approximate times needed to complete each task, where known. A discussion of construction sequences follows, and methods for accomplishing tasks are discussed further in subsequent sections.

The proposed OGS facility site consists of a 21.95-acre area, with an additional 20-acre laydown area adjacent to the project site. The depth of ground disturbance will vary between an average of 12 to 15 feet but as much as 50 feet could be excavated where pile supports for foundations are required. The laydown areas could be excavated as much as 7 feet in depth with stockpile areas sustaining up to 1 foot of subsurface disturbance. For transmission tower construction, each tower construction would result in 30 feet of subsurface disturbance and include 16-by-16 feet concrete foundations. Transmission corridor laydown areas could sustain up to 1 foot of ground disturbance. The OGS site area has been subject to agricultural activities, with nearly 50 years of continuous cultivation.

3.1 Pre-construction Phase Tasks

Pre-construction phase tasks include designating and obtaining approval of a CRS, approving the qualifications of construction monitors, submitting and obtaining CEC approval for a project CRMMP, and preparing and obtaining approval of the Worker Environmental Awareness Program (WEAP). A WEAP template training record is provided in Appendix B.

3.2 Construction Phase Tasks

Construction phase tasks include providing onsite cultural resources awareness training to all new employees during their first week of employment, keeping current with the project schedule, monitoring for cultural resources when necessary, evaluating any cultural resources discovered during construction, and mitigating any impacts on cultural resources if avoidance is not possible. Additional construction phase tasks include providing daily statements to the CEC CPM that "no cultural resources over 50 years were discovered" (assuming there were no discoveries); notifying the CPM within 24 hours of any discoveries not subject to prescriptive treatment; and maintaining daily logs, weekly summaries, and monthly compliance reports (MCR) of all cultural resources monitoring and mitigation activities at the project site.

Per CUL-6, the project owner shall ensure that the CRS, alternate CRS, or Cultural Resource Monitors (CRM) monitor full time all construction-related ground disturbance at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas.

3.3 Post-construction Phase Tasks

Post-construction phase tasks include completing test investigation or data recovery analysis and reports if buried sites are discovered during construction, preparing artifacts and other cultural materials for curation, transferring these materials to the approved curation facility, and preparing the final Cultural Resources Report (CRR) as a final report on all cultural resources management activities for the project.

After the completion of construction, non-routine ground disturbing activities would trigger the construction requirements identified in Table 1. Routine ground disturbing activities would include the excavation of an existing project feature (for the purpose of repair or replacement in-kind) where soils were previously disturbed. Non-routine ground disturbing activities would require the project owner to request approval for these activities, consistent with COC COMPLIANCE-14 by submitting an amendment petition request. This request would require an analysis by CEC staff to determine impacts and the appropriateness of any proposed mitigation. Staff could also recommend additional mitigation. In the unlikely event that an amendment petition is required, CCGS LLC would propose implementing the existing cultural resource COCs (CUL-1 to CUL-7) for any ground-disturbing activity that would occur in culturally sensitive soils.

At the end of the project's useful life or for any plant closure (planned, unplanned, or temporary), CCGS LLC would submit a closure plan consistent with COC COMPLIANCE-11, COMPLIANCE-12, or COMPLIANCE-13, as applicable. CCGS LLC would propose to implement the existing cultural resource COCs (CUL-1 to CUL-7) for any closure ground disturbing activity that would occur in culturally sensitive soils.

TABLE 1
Schedule of Pre-construction, Construction Phase, and Post-construction Tasks

Timing	Task
Pre-construction Phase Tasks	
45 days before ground disturbance	Designate a CRS and Alternate CRS and obtain CPM approval (CUL-1).
40 days before ground disturbance	Project Owner to provide the Application for Certification (AFC), data responses, all confidential cultural resources documents, maps and drawings, and the SA to the CRS (CUL-2).
30 days before ground disturbance	Provide CRMMP to CPM for approval (CUL-3).
30 days before ground disturbance	Letter to the CPM indicating that the project will pay curation fees (CUL-3).
30 days before ground disturbance	The CRS shall provide training program text and graphics and the informational brochure to the CPM for review and approval (CUL-5).
30 days before ground disturbance	Provide CPM with documentation of CRS's and CRM's authority to halt construction if previously unknown cultural resources are encountered during construction. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS (CUL-7).
30 days before ground disturbance	CPM shall provide to the CRS an electronic copy of a form to be used as a daily monitoring log (CUL-6).

TABLE 1
Schedule of Pre-construction, Construction Phase, and Post-construction Tasks

Timing	Task
20 days before ground disturbance	Designate the CRMs, document their qualifications, and provide a letter to the CPM signed by the CRS naming the CRMs and stating that they meet the qualifications stated by CUL-1. (CUL-1).
15 days before ground disturbance	Provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign (CUL-5).
10 days before ground disturbance	Confirm that CRS will be available for onsite work and will implement the conditions of certification (CUL-1).
Construction Phase Tasks	
15 days before ground disturbance for the phase	If the project is a phased project, provide maps and drawings for subsequent phases of work, if they have not already been provided, and written notification identifying proposed schedule for each project phase to the CRS and CPMs (CUL-2).
15 days before ground disturbance for a change	Provide maps and drawings to the CRS and CRMs for changes to the project (CUL-2).
10 days before task	Provide the resume of additional technical specialists (as needed) to CPM for review and approval (CUL-1).
10 days in advance	Designate a new CRS if replacement is necessary and submit qualifications to the CPM for approval (CUL-1).
5 days before a new CRM starts work	Identify replacement CRMs and provide their names and a letter signed by the CRS stating that the CRMs meet the qualifications identified in CUL-1 and send to the CPM (CUL-1).
Within 5 days of a schedule change	Provide information regarding changes to the project schedule to the CRS and CRMs and CPM (CUL-2).
Monthly	Provide in the MCR the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed the training to date (CUL-5).
Monthly	While construction monitoring is ongoing, include in the MCR any new DPR523A forms completed for finds treated prescriptively (CUL-6).
Weekly	Provide a schedule of construction activity to the CRS and CPM (CUL-2).
Daily	Provide a statement via email to the CPM indicating that no cultural resources older than 50 years have been found that day (CUL-6).
Within 48 hours of a discovery of an archaeological or ethnographic resource	Notify all Native American groups that expressed a desire to be notified in the event of such a discovery (CUL-7).
24 hours before implementing a change in monitoring level	Provide documentation justifying any change in the monitoring level. No reduction in the monitoring level may occur without approval from the CPM (CUL-6).
24 hours prior to reducing or ending daily reporting	Submit documentation detailing the justification for reducing or ending daily reporting to the CPM for review and approval (CUL-6).
24 hours following an incident of non-compliance	CRS and/or project owner shall notify the CPM and recommend corrective action to resolve the problem. When resolved, CRS shall write a report for the next MCR (CUL-6).

TABLE 1
Schedule of Pre-construction, Construction Phase, and Post-construction Tasks

Timing	Task
24 hours following notification of a cultural resources find or 48 hours following the completion of data recording or data recovery, as determined by the CPM	Submit a DPR-523 primary form for a new cultural resources find to the CPM (CUL-7).
Post-construction Tasks	
90 days after completion of ground disturbance (including landscaping)	Prepare the CRR and submit to the CPM for approval (CUL-4).
90 days after completion of ground disturbance	Provide a copy of an agreement with a qualified curation facility to accept cultural materials from the project (CUL-4).
30 days after requesting suspension of construction activities, if construction is to be suspended	Submit the draft CRR to the CPM for review and approval (CUL-4).
10 days after CPM approval of CRR	Provide documentation to the CPM that copies of the CRR were provided to the State Historic Preservation Officer (SHPO), California Historical Resources Information System (CHRIS), and curation facility (CUL-4).

SECTION 4

Previous Research and Cultural Resources Identified within the Project Area

The inventorying of cultural resources within the appropriate area for the analysis of a project's potential impacts is the first step in the assessment of whether the proposed project may cause a significant impact to an important cultural resource and therefore have an adverse effect on the environment. The area that CEC staff considers when identifying and assessing impacts to important cultural resources, called the "project area of analysis," is a composite geographic area that accommodates the analysis of each type of cultural resources that is present. The project area of analysis can vary in size, depending on the type of cultural resources under analysis, and is usually defined as a specific area within and surrounding the project site and associated linear facility corridors. For this project, staff has defined a project area of analysis for the following cultural resources types:

- For archaeological resources, the area of analysis is defined as the project site footprint, plus a buffer of 200 feet, and the project linear facilities corridor, plus 50 feet to either side of the corridor.
- For ethnographic resources, the area of analysis is expanded to take into account traditional use areas and traditional cultural properties which may be far-ranging, including views that contribute to the historical significance of the properties. The Native American Heritage Commission (NAHC) assists project cultural resources consultants and staff in identifying these resources, and consultation with Native Americans and other ethnic or community groups may contribute to defining the area of analysis. For the OGS, staff identified no ethnographic resources and so defined no area of analysis for them.
- For built-environment resources, the area of analysis is defined as one parcel deep from the project site footprint in urban areas and from any above-ground linear facilities, to encompass resources whose setting could be adversely affected by industrial development.

CH2M HILL commissioned the California Historical Resources Information System (CHRIS) Northwest Information Center to perform a literature search of the project area, including a 1-mile buffer zone around the project site and associated laydown/parking areas, and a 0.5-mile buffer zone around the linear facilities. The CHRIS literature and records review included all recorded archaeological sites and all known cultural resource survey and excavation reports. Other sources examined included the National Register of Historic Places (NRHP); the California Register of Historical Resources (CRHR); California Historical Landmarks; and California Points of Historical Interest. Historical maps consulted included a General Land Office plat map for T2N, R2E (1867 and 1872); the 1910 Jersey, California 30-minute U.S. Geological Survey (USGS) topographical quadrangle map; and the 1918 Collinsville, California 30-minute USGS topographical quadrangle map. State and local

listings were consulted for the presence of historic buildings, structures, landmarks, points of historical interest, and other cultural resources.

A Sacred Lands File search and a Native American contacts list were requested from the Native American Heritage Commission (NAHC) on April 7, 2009. The NAHC responded on April 16, 2009, with a list of Native Americans interested in consulting on development projects. At this time, no sacred sites are known to exist within the project area; however, consultation with Native American tribes and individuals provided by the NAHC was conducted. April 24, 2009, letters describing the project and including maps of the project location were sent via email or fax as well as standard mail to all individuals or tribes provided by the NAHC, inviting comments and concerns regarding the project. Andy Galvan requested access to the literature search results. The results of the literature search were provided as requested, after confirming with Northwest Information Center that this was acceptable. Mr. Galvan also requested the opportunity to view the results of the report prior to completion of the document. A summary of results was provided to Mr. Galvan via email. Mr. Galvan has requested the presence of a Native American monitor whenever an archaeological monitor is onsite during project construction. Ramona Garibay has requested to be notified in the event of a prehistoric find during construction of the OGS. The NAHC record search of the Sacred Lands file did not indicate the presence of Native American cultural resources in the immediate project area. The record search conducted at the CHRIS center also did not indicate the presence of Native American traditional cultural properties.

Additionally, on April 24, 2009, CH2M HILL contacted the East Contra Costa Historical Society and Museum and the Contra Costa County Historical Society. No additional historical resources were identified. A summary of these contacts is provided as part of Appendix 5.3A of the OGS Application for Certification (CH2M HILL, 2009). The East Contra Costa Historical Society and Museum was interested in the project and requested further information. A letter and a project map were sent via registered mail to Kathy Leighton at the East Contra Costa Historical Society and Museum on April 24, 2009. No other responses have been received at the time of this printing.

No CRHR-eligible cultural resources were identified within the OGS project area of analysis.

4.1 Previously Known Resources

According to information available in the CHRIS files, eight previous cultural resource studies, primarily cultural resource survey reports, have been prepared within the OGS plant site, laydown area, and linears and an additional 30 studies have been prepared within 1 mile of the OGS plant site and laydown/parking area, and within 0.5 mile of the OGS linears.

In reviewing the 38 studies, a single previously recorded site has been noted within the OGS 1-mile buffer area. This combination prehistoric and historic site is located within 200 feet of and to the south of the power plant site. This site, P-07-002614, is described in additional detail below. Despite eight previous surveys of the project site and laydown areas dating back to 1978, no cultural resources have been identified within any of the areas that

will be directly affected by OGS. Each recorded property is located well outside of the OGS facilities, and the project will have no effect on them.

The Burlington Northern Santa Fe railroad (BNSF), historically the Atchison, Topeka, Santa Fe railroad (ATSF), runs adjacent to the plant site and is visible on historical maps, beginning with the 1908 Antioch, California 7.5-minute USGS topographical quadrangle map. A spur line is visible on historical aerial and topographic maps, beginning with 1958 aerial photographs and the 1968 Jersey Island, California 7.5-minute USGS topographical quadrangle map. The ATSF was chartered in 1859; broke ground in Topeka, Kansas, in 1868; and by 1899 the ATSF ran through the OGS project area of analysis. In 1996, the ATSF merged with the Burlington Northern Railroad to create the BNSF (BNSF Railway Company, 2006). This railroad is recorded elsewhere in Contra Costa County as CA-CCO-732 and that previously recorded segment was determined ineligible for listing on the NRHP (Atchley and Roark, 1999).

The laydown area is located east of the power plant site and contains a spur from the railroad, which runs north through this portion of the project area of analysis. Telephone poles, railguards, and a small building associated with the spur are also located within the project laydown area. The northern half of the laydown area is paved; the concrete is in fair condition. A few building footings are still extant in this part of the property. Although most of the debris from the buildings has been removed, some piles of rubble remain. One of the footings still extant within the laydown area appears to have been one of the circa-1965 buildings constructed within the DuPont facility; the rest of the footings still in place appear more modern. Dumped debris consists of building materials, concrete, and pipe.

The cultural resources within 1 mile from the project area are described in further detail in the following subsections.

4.1.1 P-07-002614, Multicomponent Site

This site, which is approximately 200 feet from the project boundary, contains prehistoric and historic components. The prehistoric portion consists of a sparse scatter of prehistoric artifacts, including two cores and one flake tool. The historic portion consists of a light scatter of bottle glass fragments, including an aqua-colored insulator fragment; an aqua bottle top with a hand-laid ring, double bead finish, and possible tooling marks; a machined light aqua-green pickle sauce container base; and shards of white ceramic dishware, including two fragments of earthenware with an irregular matte finish and a fragment of blue-on-blue stoneware. The historic refuse is scattered over a fairly large area throughout a vineyard and into the dirt road that runs along the BNSF line.

The site is disturbed by agricultural activity and the spread of the artifacts appears to be related to this activity. Modern trash observed includes a brown beer bottle fragment, melted chunks of aluminum, a pipe clamp, and a rusted manifold gasket. Nearly all items recorded are fragmented from the disking of the area. No historic structures are known to have existed in the immediate area that could be related to agricultural activities or the nearby railroad (Brown, 2003). This site has not been evaluated for inclusion on the NRHP; and will not be affected by project-related activities.

4.1.2 CA-CCO-732, ATSF Railroad

An approximately 0.5-mile-long segment of the previously-recorded ATSF railroad was recorded within the buffer area south of the plant site and laydown area by CH2M HILL during the cultural resources survey of OGS. This segment extends from the eastern end of the laydown area to the western end of the project site, and was a part of the ATSF route that was completed in 1899. A spur line that was added in the 1950s runs north from the segment into the DuPont facility. The ATSF officially ceased operations in 1996 when the line merged with the Burlington Northern Railroad and became the BNSF. The newly recorded section of the ATSF is located approximately 200 feet south of the plant site within the 1-mile study area and runs along the footprint of the original railroad grade; however, the railroad has implemented modern upgrades to the rail line, including modern rail crossings, and upgraded rail lines and ties. Additionally, the rail grade itself has been modified to allow for heavier loads to be run on the tracks. This particular segment of the BNSF, or the former ATSF, and the short spur that leads into the DuPont facility do not appear to be eligible for listing on the NRHP as neither retains integrity of materials and workmanship.

4.2 Newly Recorded or Updated Resources

4.2.1 Archaeological Field Survey

A cultural resources survey of the OGS project area of analysis was conducted on April 20, 2009, by CH2M HILL. This field survey included the power plant site, temporary laydown/parking area, soil stockpile areas, sanitary sewer force main route, and the transmission line corridor.

As per the latest CEC *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 2007), in addition to the power plant site and the construction laydown/parking area, a 200-foot minimum buffer was surveyed for cultural resources around these facilities. In addition to the survey of the transmission line corridor, a 50-foot minimum buffer was surveyed around the corridor.

The survey used linear pedestrian transects spaced at 10 meters and opportunistic examination of exposed soils to examine the survey areas to determine whether archaeological deposits might be present. Exposed soils, consisting mainly of previously disturbed agricultural sediments and road bed material, were inspected carefully, and no evidence of cultural materials was noted in the areas surveyed.

Visibility within most of the proposed OGS plant site was generally excellent. Most of the power plant site is in actively cultivated vineyards, and visibility throughout the vineyards was approximately 80 percent or better. The western end of the power plant site has very limited visibility—less than 30 percent. A large motor had been dumped in this area. Ground visibility within the wetland area, which is in the buffer area, is almost zero.

Site P-07-002617, a prehistoric and historic site, was relocated during the survey investigation. The site is located south of the ATSF/BNSF railroad tracks. The prehistoric portion consists of a sparse scatter of prehistoric artifacts, including two cores and one flake tool. The historic portion consists of a light scatter of bottle glass fragments, including an

aqua colored insulator fragment; an aqua bottle top with a hand-laid ring, double bead finish, and possible tooling marks; a machined light green aqua pickle sauce container base; and shards of white ceramic dishware, including two fragments of earthenware with an irregular matte finish and a fragment of blue-on-blue stoneware. Additional to the original prehistoric inventory, a stone tool core was found and included in the updated site record. This site has not yet been evaluated for inclusion on the NRHP. While this site is located within the 200-foot archeological survey buffer, it will not be affected by project-related activities.

The ATSF railroad is located just south of the plant site, within the 200-foot buffer. One previously recorded prehistoric and historic site (Site P-07-002614, discussed previously) is also located just inside the 200-foot buffer; and a single prehistoric core was noted in this area, along the dirt road just south of the railroad and within the recorded site boundary. The power plant site is disturbed by agricultural activities, one dirt road, and a telephone line. Three of the poles in this line have been cut down and the line, a modern one, is now defunct. The buffer area is further disturbed by a paved road, several dirt roads, the railroad, and fencing that encircles the DuPont facility. A pile of discarded rail ties, lines, and other rail debris was observed in the southern buffer area.

No new archaeological resources were observed during the pedestrian field survey of the OGS facilities and laydown areas, soil stockpile areas, or the transmission line corridor.

4.2.2 Architectural Survey

CH2M HILL performed a survey of the built environment resources in the project area of analysis. Historical aerial photographs, USGS topographical maps, and the Contra Costa County Assessor records were consulted to determine dates of building construction and to document the evolution of development in the project area. The survey examined built resources within one parcel's distance of the project site and aboveground linear facilities (i.e., within those parcels immediately adjoining the project parcel boundaries and the routes of the aboveground linear facilities). The survey area is a mix of early and mid-twentieth century properties and late twentieth-century planned housing development, a utility substation and transmission line corridors, industrial and commercial buildings, and two transportation corridors.

Development in the area was sparse and primarily agricultural until the 1960s. Between 1953 and 1968, roads began to be paved and more buildings, presumably residential, were constructed. The DuPont plant was opened in 1956. The mobile home park at 5751 Bridgehead Road was constructed at this time, but appears to have been partially demolished by the construction of SR 160 in the early 1970s. The transmission line from the DuPont plant to the Hillcrest Substation and Yard/Contra Costa Substation does not appear on historical quadrangle maps, and likely would have been moved during construction of SR 160 in the 1970s. The Almondridge subdivision, which straddles the transmission line between Phillips Lane and Viera Avenue, appears to have been developed in the 1980s (CEC, 2011).

A total of 14 built environment resources in the project area of analysis date to 1965 or earlier and were recorded by CH2M HILL. They included 10 residential structures and

four commercial/industrial buildings. The residential structures include a modest Craftsman-style residence, a Ranch-style residence, and Minimal Traditional residences.

Structures at 2122 Willow Avenue (1956), 3001 Oakley Road (1915), 5301 Elm Street (c. 1950), 5346 Elm Street (1947), 5387 Elm Street (1951), 5394 Elm Street (1946), 5406 Elm Lane (1947), and 5487 Elm Lane (1953) are all examples of post-World War II residential development. All are single-story, wood-frame houses, clad predominantly with stucco in either the Ranch or Minimal Traditional style. They have hipped or gabled composition shingle roofs and metal or vinyl replacement windows, with the exception of 5301 Elm Street, which retains some wood sash. The primary residence at 3001 Oakley Road was originally constructed in 1915, earlier than the others; however, it was heavily modified at some point to resemble a Minimal Traditional-style residence (CH2M HILL, 2009; Appendix 5.3B, DPR 523 forms).

The structure at 3401 Oakley Road is a modest example of a Craftsman- or Bungalow-style residence. It is a one-story, single-family building with a front gable roof, exposed rafters and clapboard siding. The house has a front gable roof, and a wing projects slightly from the north side of the building. The windows appear to have been replaced (CH2M HILL, 2009; Appendix 5.3B, DPR 523 forms). All of the residential structures have been modified since their construction, and none were identified by CH2M HILL as noteworthy examples of their respective architectural types.

The 5751 Bridgehead Road location is a mobile home park that, based on historic aerial photographs, was constructed circa 1956. The lots were initially laid out in rows with a tree between each mobile home, but this configuration has deteriorated over time. The construction of SR 160 appears to have altered the size of the park, which is now smaller than its original footprint. The current buildings appear to be modern, one-story prefabricated homes (CH2M HILL 2009; Appendix 5.3B, DPR 523 forms).

The Antioch natural gas terminal, located at 5900 Bridgehead Road, was constructed circa 1952 and serves as the center for natural gas transmission. It is a one-story, concrete block, rectangular building with a flat roof that cantilevers out beyond the face of the building. There are cut-outs along the cantilever, which is supported by a concrete wall at the center of the building. There are several fixed metal windows on the building, which is accessed via entrances on the west and north elevations. Several other one-story concrete buildings are located on the site (CH2M HILL 2009; Appendix 5.3B, DPR 523 forms).

The DuPont Oakley Plant, located at 6000 Bridgehead Road, was constructed between 1955 and 1956 as a Freon manufacturing plant. The location provided easy access to SR 160 and the ATSF railroad. The DuPont Antioch Works began producing Freon and tetraethyl lead (TEL) in 1956. In 1958, the plant consisted of more than 20 buildings and holding tanks. Buildings included the administration building, gatehouse, water storage tank, and associated fire pump house, and the purchased power station. When the company started production of titanium oxide in 1963, buildings associated with this production were constructed on the eastern and southern end of the property. No further significant construction appears to have taken place after 1963. Both Freon and TEL have since been banned or phased out of production, leading to the shutdown and dismantling of the plant. Of the more than 40 buildings and structures that existed during the plant's operation, the administration building, gate house, water storage tank, fire pump house and purchased power substation (all circa 1958) are still extant, along with a pipe plant building, RCRA

building, flammable drum storage, the security, personnel orientation, emergency response/Terp building, Freon warehouse, DAP warehouse, and two additional unnamed buildings, all constructed after 1965. Only the administration building and gate house remain in use.

The building at 6113 Bridgehead Road is a small, one-story, vacant commercial structure constructed in 1961. The very low side-gable roof has a wide overhanging eave that covers the entrance and forms a small porch, which is supported by thick posts and a decorative railing. The building is clad with smooth-finished stucco and has sliding metal sash windows with prominent window frames and false keystones. The building, once surrounded by agricultural fields, is now surrounded by pavement. SR 160 runs behind the building, slightly obscured by a raised embankment and mature eucalyptus trees.

The Contra Costa Substation was constructed in the late 1940s or early 1950s, likely coinciding with the construction of the Contra Costa power station at Marsh Landing (CH2M HILL, 2009; Appendix 5.3B, DPR 523 forms). While the construction history of the property is not known, it appears to include approximately 20 structures, a large parking lot, and outdoor equipment storage on the western half of the site, and large electrical transmission equipment on the eastern half of the site

There are one prehistoric/historic archaeological site and 16 built-environment resources within the 1-mile records search radius and archaeological and built-environment survey area, as shown in Table 2. The prehistoric/historic site is a sparse prehistoric scatter and historic trash scatter (P-07-002614), located south of the project site. Ten of the built-environment resources are residential, four are commercial or utility-related, one is a bridge, and one is a linear resource, the (formerly ATSF) BNSF railroad.

No CRHR-eligible cultural resources were identified within the OGS project area of analysis.

TABLE 2
Known Cultural Resources Located in the Vicinity of the Proposed Project

Resource Type and Designation	Resource Designation	Resource Description	Previously Known/New
Prehistoric Archaeological Resources	P-07-002614	Prehistoric/historic artifact scatter	Previously Known
Built-environment Resources	ATSF Railroad/ CA-CCO-732	0.5-mile segment of railroad (1899, with modern upgrades)	Newly Recorded
	ATSF Trestle Bridge	Railroad trestle bridge	Newly Recorded
	2212 Willow Ranch Ave. Antioch	Ranch-style residence (1956)	Newly Recorded
	3001 Oakley Rd., Antioch	Minimal Traditional residence (date unknown)	Newly Recorded
	3401 Oakley Rd., Antioch	Craftsman-style residence (1921)	Newly Recorded
	5301 Elm Lane, Antioch	Minimal Traditional (c. 1950)	Newly Recorded

TABLE 2
Known Cultural Resources Located in the Vicinity of the Proposed Project

Resource Type and Designation	Resource Designation	Resource Description	Previously Known/New
Built-environment Resources, cont.	5346 Elm Lane, Antioch	Minimal Traditional (1947)	Newly Recorded
	5387 Elm Lane, Antioch	Minimal Traditional (1951)	Newly Recorded
	5394 Elm Lane, Antioch	Minimal Traditional (1946)	Newly Recorded
	5406 Elm Lane, Antioch	Minimal Traditional (1947)	Newly Recorded
	5487 Elm Lane, Antioch	Minimal Traditional (1953)	Newly Recorded
	5751 Bridgehead Rd., Antioch (Sandy Point 3)	Prefabricated (35 residences, 1953-1968)	Newly Recorded
	Antioch Gas Terminal (5900 Bridgehead Rd.)	Utilitarian (c. 1952)	Newly Recorded
	DuPont Oakley Plant (6000 Bridgehead Rd.)	International, Utilitarian/Industrial (c. 1955-1956)	Newly Recorded
	6113 Bridgehead Rd.	Commercial (1961)	Newly Recorded
	Contra Costa Substation	Unknown (c. 1950)	Newly Recorded

4.3 Post-certification, Preconstruction Surveys

The project is not certified at the time of this writing. Post-certification/preconstruction surveys are not expected, however.

SECTION 5

Research Design

This section proposes a research design for archaeological cultural resources that could be found in the project area of analysis during project construction. The research design's purpose is to provide prehistoric and historic contexts and an explicit theoretical framework that the project owner may use to analyze and evaluate the CRHR (or NRHP) eligibility of any discovered cultural resources, and, where warranted, begin to develop resource-specific data recovery plans. CRHR or NRHP evaluation is best facilitated by an explicit theoretical orientation and a series of related research domains or larger questions by which to assess an archaeological site's information value. Because the project area of analysis has been surveyed for cultural resources, it is likely that any cultural resources to be found during construction would be buried archaeological sites.

Archaeological sites most often achieve significance for the potential they have to produce valuable information about the past, rather than other significance criteria associated with historical events, persons, or styles (e.g., trends, example of a type, or the work of a master). Any archaeological deposits found during the course of project construction would likely be found eligible under NRHP Criterion D for properties that "have yielded, or may be likely to yield, information important in prehistory or history" (36 Code of Federal Regulations 60) if they are found eligible. Similarly, a site found to qualify for CRHR listing would likely be significant under Criterion 4 for a property that has "yielded, or has the potential to yield, information important in prehistory or history of the local area, California, or the nation" (California Public Resource Code 5024.1). If buried archaeological sites are most likely to be found significant for their information value, an explicit theoretical framework would provide for more lucid assessments and interpretations of that information. Lacking such a framework, determinations as to whether information is important and whether a particular site is significant and worthy of protection become arbitrary and difficult to defend.

Because the precise nature of the sites that might be encountered during project construction is not yet known, the specific research potential of such sites is not known because it is only possible to approximate based on known site types and integrity. However, based on ample research of previously known cultural resources in the project region and geoarchaeological studies (Meyer, 2009; CH2M HILL, 2009), it is possible to establish a framework to consider the value of any sites that might be encountered. The known resources allow for creating models of predictability of site types and distribution. Archaeological records indicate that California's prehistoric occupation began, at a minimum, 12,000 years ago (CEC, 2010b; Earle et al., 1998; Moratto, 1984). The project region alone has received continued archaeological interest since extensive fieldwork and research were first done in the 1930s, cataloguing an abundance of data not equaled in other regions of California (Peak and Associates, 1999). Preliminary research designs for prehistoric and historic sites that might be encountered at the OGS site can help in planning archaeological test investigations; if testing does not exhaust the site's research potential, then the research design can help plan data recovery excavations. The research design can also help plan the analysis of materials recovered from test investigations or data recovery excavations. A more focused research

design with additional research questions may also be appropriate based on the testing and excavation of an unanticipated site.

This research design would be implemented if an archaeological site were discovered during construction, or if a newly discovered significant site needed evaluation to determine significance or data recovery as a mitigation measure. Making a judgment about the need for additional testing or full-scale data recovery requires collecting certain basic information about the site's contents and structure and evaluating the contents in the context of our present knowledge about the regional prehistory of the project area. Answers to the following (and other) questions would provide basic facts:

- Are there temporally diagnostic artifacts associated with the site?
- Are the temporally diagnostic artifacts consistent in age with other datable materials such as organics?
- What is the potential for preserved bone and other organic materials?
- What is the extent of the site (boundaries, depth of deposit, and depth below surface)?
- Are the cultural deposits relatively intact?
- Does the artifact assemblage indicate site function?
- Is this a single-component or multi-component site?
- Does this site provide evidence for temporary or long-term occupation?
- Can cultural affiliation be gleaned from the archaeological record?
- Is the cultural affiliation consistent with known traditional use areas for regional tribal groups? Is there evidence in the record for cultural exchange or multi-group affiliation?

Once information is gathered to address these questions, it would be possible to examine the site's potential to contribute to regional and local archaeological research. This would be done by assessing the value of the site's materials and artifacts in relation to basic questions, problems, or research domains outlined in a research design. A research design would identify topics or questions that could be addressed, given the kinds of data that a particular property type is likely to contain.; The research design would first establish a structure of inquiry and identify data requirements for answering important research questions within that structure and then assesses the potential significance of the site based on the criteria provided in the research design.

5.1 Context Statement for Archaeological Resources

In the Coastal Range and central California, cultural resources minimally represent 12,000 years of prehistory. Although written historical sources tell the story of only the past 200 years, archaeologists have reconstructed general trends of prehistory in the project region, specifically in the Sacramento-San Joaquin River Delta in Contra Costa County and the western Central Valley of California.

Since the first inquiry of Native American cultural groups began, numerous classifications and chronological models have been created for California. For central California alone, several chronologies have been proposed, and generally, these chronologies have been variations on a wide-ranging California chronology. In the 1930s, excavations of the Central Valley provided materials that prompted the development of the first major Central California sequence. This new chronological schema was proposed by Lillard, Heizer, and Fenenga, and became known as the Central California Taxonomic System (CCTS). The CCTS consists of three broad prehistoric cultural eras: an Early Horizon, a Middle Horizon, and a Late Horizon (Fredrickson, 1974; Elsasser, 1978). However, wide regional differences in central California, and significant temporal overlap between site types classified into these three horizons, prevented clear distinctions between horizons.

In the 1970s, attempts to create an established chorological model based on the archaeological record for the region and hard temporal markers (such as carbon-dated materials) produced a specific and meaningful model. Fredrickson revised the CCTS and incorporated numerous changes, including adding three temporal zones with cultural patterns solely based on regional observations in the archaeological record. The three additions to the chronological model of the CCTS were Windmiller, Berkeley, and Augustine patterns (Fredrickson, 1974; Moratto, 1984).

Further refinements have been made to the CCTS, with additional epochs incorporated in the chronological schema for Central California. However, for the purpose of relating predictive models of site types and distribution, based on archaeological resources in the project area, models, such as that suggested by Rosenthal that include extensive Paleo-Indian subdivisions, will not be incorporated in this design.

5.1.1 Project Description

The project site is located in northeastern Contra Costa County, adjacent to the Sacramento-San Joaquin River Delta and the western Central Valley. The OGS is located in the city of Oakley and transmission line features continue into Antioch, California.

The OGS facility will be constructed on a 21.95-acre area on the DuPont Property, and will be a natural gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 624 MW.

The depth of ground disturbance will vary between 12 to 15 feet but as much as 50 feet could be excavated where pile supports for foundations are required. The laydown areas could be excavated as much as 7 feet in depth with stockpile areas sustaining up to 1 foot of subsurface disturbance. For transmission tower construction, each tower construction would result in 30 feet of subsurface disturbance and include 16-by-16 feet concrete foundations. Transmission corridor laydown areas could sustain up to 1 foot of ground disturbance. The project site has been subject to agricultural activities, with nearly 50 years of continuous cultivation.

5.1.2 Prehistory

Paleo-Indian Period (12,000 to 5,000 years ago)

The Paleo-Indian Period covers the interval from the first accepted presence of humans California in the late Pleistocene until approximately 5, 000 years ago. Artifacts and cultural activities from this period represent a predominantly hunting culture; diagnostic artifacts include extremely large, often fluted bifaces associated with use of the spear and the atlatl. Populations appeared to have been relatively small and highly mobile, living in temporary camps near readily available water. Abundant evidence exists that humans were present in North America for at least the past 11,500 years. Also fragmentary, but growing, evidence exists that humans were present long before that date. Linguistic and genetic studies suggest that human colonization of North America may have occurred 20,000 to 40,000 years ago. Evidence of this earlier occupation is not yet conclusive but is beginning to be accepted by archaeologists. The Meadowcroft Rockshelter in Pennsylvania and Monte Verde in Chile, for instance, are two sites that have produced apparently reliable dates as early as 12,500 years before present. These earliest known remains indicate very small, mobile populations that were apparently dependent on hunting large game animals as the primary subsistence strategy.

The earliest sites in the Central Valley are Fluted Point Tradition and Western Pluvial Lakes Tradition sites found at Tracy, Tulare, and Buena Vista lakes. These sites are few in number and remain undated by scientific means, but the assemblage types indicate probable ages of 11,500 to 7,500 years (Moratto, 1984). For the entire Central Valley region, there are only three known sites that date from the early Paleo-Indian period (CEC, 2010b:5.3-7). Overall, evidence for Paleo-Indian occupation in the Central Valley is currently limited, containing many gaps. The archaeological record requires additional data for researchers to better understand this chronological sequence.

Windmiller Pattern (5,000 to 3,000 years ago)

For the project region, the cultural sequence begins with the Windmiller Pattern. The majority of the known Windmiller Pattern sites date to approximately 5,000 to 2,250 years ago; a small number of Windmiller sites dates as late as 1,250 to 750 years ago. Windmiller populations moved seasonally between the valleys in the winter and the Sierra Nevada foothills in the summer. Fishing and hunting were the primary subsistence strategies. Windmiller sites are characterized by tools related to hunting, fishing, and milling and include mortars, baked clay balls, trident fish spears, two types of angling hooks, pecan-sized baked clay fish line sinkers, bone awls and needles, polished charmstones, shell working and shell appliqué, and flaked tools, including projectile points (Moratto, 1984). Mortuary practices frequently consist of fully extended burials, oriented towards the west with abundant funerary paraphernalia. It is suggested, by various California archaeologists, that Windmiller sites are evidence for outside influences in the form of migration into California by groups from the East (Coleman, 2008; Moratto, 1984). The suggested influences deal with riverine adaptations and wet land exploitation of resources, evidenced by this period's site distributions, which tend to be in river environments. This cultural sequence is well established in wetland environs, valley floors and seasonal flood plains, all containing Holocene-epoch sediments (CEC, 2010b).

Berkeley Pattern (3,000 to 1,250 years ago)

The Berkeley Pattern coincides roughly with the Middle Horizon, and most known Berkeley Pattern sites dates to approximately 2,500 to 1,250 years ago. A few Berkeley sites extend outside this timeframe and date as early as 3,200 years ago and as late as 500 years ago. Current evidence suggests that the Berkley and Windmiller Patterns occurred concomitantly in separate areas of the San Joaquin Valley (CEC, 2010b). In response to environmental technological factors, economies became more diversified and sedentary lifestyles developed further, while population growth and expansion occurred. The Berkeley Pattern subsistence relied less on hunting and fishing than did the Windmiller Pattern, although riverine exploitation and occupation continued. Sites were diversely distributed throughout various environments. Increasing dependence on plant goods defined the artifact assemblage encountered in the Berkeley sites, in the form of milling stones. Mortars and pestles were present in far greater numbers than in preceding cultural periods. Other artifacts characterizing Berkeley sites include shell and steatite beads, slate pendants, ear ornaments, distinctive diagonal flaking of large concave base points, and greater numbers of bone tools of superior manufacture. Mortuary practices also differed from the previous pattern. There was a marked preference for a flexed versus an extended interment, orientation was not always to the west and the number of burial goods found in cemeteries decreased noticeably.

Augustine Pattern (1,250 to 250 years ago)

The Augustine Pattern coincided approximately with the Late Horizon and generally dates from 1,250 to 250 years ago. Augustine Pattern sites are much more widespread than Berkeley Pattern sites and are characterized by intensive fishing, hunting, and acorn gathering. Population densities were much higher and exchange systems were more sophisticated and included the advent of clamshell disk beads for goods exchange. High variability in funerary artifacts seems to indicate more social stratification. Cremations and flexed burials were common. Artifacts associated with the Augustine Pattern include the bow and arrow, shaped mortars and pestles, and pottery in some parts of the central San Joaquin Valley (Moratto 1984). Elaborate trade networking, decrease in previous technologies, an increase in the use of the bow and arrow, and cremations were hallmarks of this pattern. This period provides the greatest amounts of archaeological data because it is the most well-defined in the Delta (CEC, 2010b).

5.1.3 Ethnography

The project is in the territory associated with the ethnographic and historic boundaries of the Bay Miwok (Bennyhoff, 1977: Map 2; Kroeber, 1925; Schenck, 1926:137; Levy, 1978a, 1978b; and Wallace, 1978). The Miwok is from the Penutian family of languages and includes the Wintun, Maidu, Costanoan, and Yokuts. The Penutian language family occupied nearly half of California and most of central California. The Bay Miwok occupied the areas from the inner Coast Ranges near Mount Diablo and into the Delta region (Levy, 1978a). Ethnographic information about the Bay Miwok is scarce because large numbers of Bay Miwok were moved from their traditional lands onto mission lands (Kroeber, 1925). The Bay Miwok were the first of the Eastern Miwok to be missionized and the first converts among the Bay Miwok came from the Saclan tribelet to Mission San Francisco in 1794 (Levy, 1978a). Many more Bay Miwok were moved to Mission San Jose.

Bay Miwok lived in tribelets, which was the primary political unit. Each Bay Miwok tribelet occupied a specific territory, using several permanently inhabited settlements and a larger number of seasonal campsites at various times during their annual subsistence round (Levy, 1978a:398). Tribelets controlled an area that included several permanent settlements, seasonally occupied campsites, and resource procurement sites. Permanent settlements could include brush shelters, sweat houses, acorn granaries, a dance house, and several earth-covered houses (Kroeber, 1925: 447). Bay Miwok also recognized lineage as a political unit. Permanent settlements were occupied by different lineage groups and were often named for a specific geographic locality (Levy, 1978a).

Similarly to other groups in California, the Bay Miwok practiced a hunting and gathering economy. Bay Miwok subsistence was based primarily on hunting, gathering, and fishing. Only tobacco was occasionally planted and cultivated. Hunted animals included deer, antelope, tule elk, and rabbit. Quail, pigeons, jays, and flickers were trapped. Duck and other water fowl were caught in nets. Bay Miwok fished with nets, harpoons, and hooks, depending upon the fish. A wide variety of plant foods were gathered, but the acorn was the most important and the Bay Miwok gathered several different varieties of acorn. Nuts, seeds, and roots were also gathered and many different types of plants were eaten as greens (Levy, 1978a). In historic times, the Miwok traded with the Yokuts and Costanoan (Davis, 1961:33, after Barrett and Gifford, 1933:270; and Pilling, 1950:438).

On April 3, 1776, a European exploratory expedition visited a Bay Miwok village of approximately 400 persons near Antioch, California. The settlement appears to have been the village of Chupcan (Levy, 1978a), which would have been the nearest permanent Bay Miwok settlement to the OGS project area.

The indigenous lifeway apparently disappeared by the early 1800s because of the disruption by new diseases, a declining birth rate, the impact of the mission system, depredation by prospectors on their way to the gold country, and later displacement by Euroamerican farming. As with other native California groups, the Bay Miwok were transformed from hunters and gatherers into agricultural laborers who lived at the missions and worked with former neighboring groups such as the Costanoan and Esselen (Levy 1978b:460). Thus, multi-ethnic Native American communities grew up in and around former Bay Miwok territory. The Native Americans that resided in these communities provided much of the ethnological data, along with the detailed accounts by contact explorers, which form the basis of the descriptions of the ethnographic inhabitants of the San Francisco Bay Area and central California (Garaventa et al., 1991:14).

5.1.4 History

In 1542, Juan Rodriguez Cabrillo explored the California coast by ship. Much of the early exploration of California was conducted this way. California's interior, including the Delta region and Central Valley, remained unexplored by Europeans until the beginning of the Spanish Period.

The Spanish period spans 1769 to 1822 beginning with the founding of the first mission, the Mission San Diego de Alcala in 1769. It was not until March 1772 that the first formal European expedition, led by Pedro Fages, entered the northern San Joaquin Valley. Fages searched for the first Europeans to enter the San Joaquin Valley, the Spanish deserters.

The other purpose of the Fages expedition was to find an overland route to Point Reyes. The company kept to the shoreline until they reached the mouth of the San Joaquin River and first observed the valley (Smith, 2004). Shortly after the Fages expedition returned to Monterey, Father Francisco Garcés entered the San Joaquin Valley and made the first observations of the valley. His observations included native villages, wide rivers, large tule swamps, and huge herds of tule elk.

A measles epidemic swept through the mission in 1806, and many of the neophytes at the mission succumbed to the disease. Because of the high toll from the disease, the padres decided to move the mission to the Sonoma Valley. However, the old mission, the Old Mission San Francisco, remained standing and the newly constructed mission was referred to as the New Mission San Francisco. Mission San José was situated approximately 15 miles north of the town of San José in 1797. This mission supplied Russian settlements with grain, had a good vineyard and fruit trees, cattle, horses, sheep, and mules, as well as approximately 3,000 Indian neophytes (Bancroft, 1888). Once constructed, missions were fairly self sufficient with a large labor force and in most cases were quite profitable.

In 1821, Mexico gained independence from Spain. The period from 1821 to 1848 is referred to as the Mexican Rancho Period. It was during this period that large tracts of land, called ranchos, were granted by the various Mexican governors of Alta California, usually to individuals who had worked in the service of the Mexican government. The *Rancho de Los Medanos,* which included approximately 9,000 acres, was located along the San Joaquin River and the Suisun Bay and is the closest rancho to the OGS site. This rancho encompasses much of present day Antioch, California. The rancho was originally granted to Jose Antonio Mesa and Juan Migues Garcia in 1839. Some sources show Jose Noriega as the original grantee in 1836 (Hulaniski, 1917: 12). The grant was passed from either Noriega in 1837 or from Mesa and Garcia in 1839 to an American explorer and settler, Dr. John Marsh, who occupied the rancho until he was murdered in 1856 (Hulaniski, 1917; Hoover et al., 1990). Dr. Marsh was one of the first American settlers in the area and, at the end of the Mexican War, wrote a series of letters to Congress and various newspapers describing the landscape of California in a favorable manner. His writings are credited with helping to achieve California statehood and dispelling ideas held by many Easterners that thought the entirety of the West was arid, barren, and hot (Hulaniski, 1917).

In 1833, 11 years after gaining independence from Spain, the Mexican government's Secularization Act changed missions into civil parishes, and those natives who had inhabited regions adjacent to a Spanish Period mission were to obtain half of all mission possessions, including land. However, in most instances this did not occur, and the Secularization Act resulted in transferring large mission tracts to politically prominent individuals.

On June 14, 1846, a small number of Californians, mostly of American rather than Mexican origin and aided by John C. Fremont, an agent of the United States Government, seized control of the citadel of Sonoma from Mexican officials and hoisted a flag with a grizzly bear that read "Republic of California," declaring California a free and independent republic. The short Bear Flag Revolt resulted in a republic which lasted for less than a month (Hulaniski, 1917).

Following the end of hostilities between Mexico and the United States in January 1847, the United States officially obtained California from Mexico through the Treaty of Guadalupe Hidalgo on February 2, 1848 (Cleland, 1941: xiii). Thus the American Period begins in 1848. In 1850, California was accepted into the Union of the United States primarily because of the population increase created by the Gold Rush of 1849.

The California cattle industry reached its greatest prosperity during the first years of the American Period. Mexican-Period land grants had created large, pastoral estates in California. A high demand for beef during the Gold Rush led to a cattle boom that lasted from 1849 to 1855. In 1855, however, the demand for California beef began to decline as a result of sheep imports from New Mexico, cattle imports from the Mississippi and Missouri valleys, and the development of stock breeding farms. When the beef market collapsed, the California ranchers were unprepared. Many had borrowed heavily during the boom, mortgaging their land at interest rates as high as 10 percent per month. The collapse of the cattle market meant that many ranchos were lost through foreclosure, while others were sold to pay debts and taxes (Cleland, 1941: 108-114).

During the American period, in addition to cattle and sheep ranches, a growing number of farms appeared. A rural community cultural pattern existed in the project area from approximately 1870 to 1930. This pattern consisted of communities consisting of population aggregates that lived within well-defined geographic boundaries, shared common bonds, and solved shared problems. They lived on farmsteads tied together by a common school district, church, post office, and country store. These farmsteads and dispersed farming communities gave way to horse ranches, dairies, and nurseries, which in turn were replaced by the newly established roadside service complex. The roadside service industry thrived in the highly mobile, mechanized, pre- and post-war society, which was linked by state and federal roadways.

The Sacramento-San Joaquin Delta region developed into an important agricultural region within the new state of California between 1850 and 1870. Initially, crops grown in the region included potatoes, beans, and onions. After 1870, Delta farmers diversified and began growing wheat, oats, barley, and fruit trees. By the 1910s, the region was producing approximately two-thirds of California's potato, asparagus, bean, onion, and celery crops (Hulaniski, 1917). Agriculture remains an important industry in the Delta. Railroads crossed through the area in the late 1800s, including the ATSF and Southern Pacific Railroad (SPRR).

The ATSF, one of the first transcontinental railroads in America, was chartered in Kansas in February 1859 and broke ground in Topeka in October 1868. The ATSF's first section of track was opened on April 1869 and it was constructed to Colorado by March 1876. The ATSF merged with the BNSF (created in 1970) in December of 1996. An approximate 0.5-mile segment of the ATSF, constructed in 1899, runs outside of the OGS site in the southern boundary of the DuPont property. In the 1950s, a spur of the railroad was built into the DuPont Plant.

5.1.5 Oakley, Antioch, and the OGS Area

Joseph H. and William W. Smith, who were brothers, are the considered the original settlers of Antioch. The Smith brothers came to the area in 1849 and originally worked as carpenters. The lands the brothers settled were a part of the original *Los Medanos Rancho*

owned at the time of sale by Dr. Marsh and, after the sale, the two quarter-sections of land were referred to locally as Smith's Landing. In 1850, Reverend W. W. Smith encouraged a shipload of settlers from Maine to settle in Smith's Landing, granting each family one lot on which to build their homes. The name was changed to Antioch around the same time. Antioch was named by the residents of the town at a July 4 picnic held at W. W. Smith's house (Hulaniski, 1917).

In 1859, coal was discovered in the hills south of Antioch and, in 1876, the Empire Coal Company was formed to mine it. In 1863, copper was discovered near Antioch. Other early industries that contributed to the growth of Antioch included lumber companies and paper mills. The town's early growth depended in part on its prime location on the river, providing ready freight access to San Francisco and other points in the Bay Area and also upstream to Stockton and Sacramento (Hoover et al., 1990).

The ATSF railroad was completed through the area by 1878, and the SPRR San Francisco and New Orleans Line was completed through the area in 1899. Several short-line railroads ran south from the town toward Mt. Diablo and the nearby coal mines; one railroad line ran from a landing on the river toward Somerville to the south. Having access to both water and rail-related transportation facilities provided the community with the means to move goods and services to and from the area. Several industries—coal mining, paper milling, and later, utilities—in addition to local farmers and ranchers, were important to the growth of the town and its hinterlands.

Oakley was originally situated within an ATSF railroad grant land. In 1897, James O'Hara began selling the grant land to private individuals for 50 dollars an acre. O'Hara also convinced the railroad to build an additional 0.5 mile of side track and a shelter for waiting for trains, and eventually a station when business increased in Oakley. All available land available for sale in Oakley was sold in 2 years. One of the purchasers, R.C. Marsh, purchased 2 acres of land situated within the present day boundaries of the City of Oakley. A year later, Marsh was confirmed as the postmaster of Oakley, California. The Santa Fe Company finished the line through the area in 1899, and the first passenger train ran from Oakley to Stockton in July 1900. The station that was eventually built proved to be invaluable to the fruit and almond industry that flourished in the area (Hulaniski, 1917). The City of Oakley was finally incorporated in 1999.

The DuPont Company purchased 552 acres of land in unincorporated eastern Contra Costa County in 1955 to construct a Freon manufacturing plant. The plant site was located east of Antioch on Bridgehead Road, with access to the ATSF located a few parcels to south of the property. Bridgehead Road was a primary north-south road, providing access to the Antioch Bridge, which crosses the San Joaquin River north of the plant. Bridgehead Road is also part of SR 160, which connects Antioch with Sacramento. This location gave the company access to both rail and road transportation options. Although the plant was close to the river, DuPont does not appear to have used the river for transportation of goods.

The DuPont Antioch Works began operation in 1956, producing Freon and TEL. The former was used as a refrigerant and the later was an additive to gasoline to reduce "knocking." Freon, the name trademarked by DuPont, is actually several different chlorofluorocarbons (CFCs), containing carbon and fluorine, with additives such as hydrogen, bromine, and chlorine. (Britannica Online Encyclopedia, accessed March 4, 2010). This product was

created in the late 1920s as a substitute refrigerant to ammonia, sulfur dioxide, and methyl chloride then being used. CFCs were believed to be non-toxic, unlike methyl chlorine, as well as non-flammable and non-corrosive. In addition to refrigeration equipment, Freon was used in home air conditioning units, automobiles, and aerosol cans. CFCs were found to be one cause of ozone-depletion and, as a result, most have been banned in the United States since the 1990s. The banning of Freon as a refrigerant, removed the market for this product and led to the shutdown and dismantling of DuPont's Freon manufacturing works at Oakley.

TEL, also referred to as leaded gasoline, was first produced in 1927. Studies continuing through the 1970s showed that the levels of lead in the gasoline posed significant threats to the public health. The amount of lead in gasoline has been, by law, decreasing since 1975. This led to the shutdown and eventual dismantling of DuPont's TEL manufacturing works in Oakley.

A 1958 aerial photograph shows that the plant consisted of more than 20 buildings and a number of holding tanks, including the administrative building, gate house, water storage tank and associated fire pump house, and the purchased power station. On the northeast of the property were two holding basins. The internal road system and railroad spur were already in place.

In 1963, the company built facilities at this location to produce titanium dioxide, a white pigment used in a variety of products, such as paint and toothpaste. It does not appear that any significant building periods occurred after 1963 at the plant.

In 1978, the California Department of Transportation removed the 1926 Antioch Bridge over the San Joaquin River. The original 1926 bridge was a two-lane lift span and was unable to accommodate the increasing river traffic. It was also damaged by several serious collisions. The construction of the new bridge coincided with upgrades and alterations to SR 160. SR 160 was moved off of Bridgehead Road and shifted to an elevated roadway a few yards to the west. The on/off ramps to SR 160 are located at Main Street/ E. 18th Street, one-half mile south/southwest of the main entrance to the plant.

At its peak era of production in the 1980s, the DuPont Antioch Works employed 600 people from the nearby communities of Oakley, Brentwood, and Antioch. The TEL plant shut down in 1981 and the Freon plant was shut down in 1997. In 1998, the titanium oxide facility shut down and the company demolished or removed most remaining buildings and manufacturing equipment. Research Questions and Data Sources for Prehistoric Resources

5.1.6 Cultural Chronology

The general trend throughout California prehistory has been an increase in population density, coupled with less activity and a greater diversity of food resources. Chartkoff and Chartkoff (1984) identified three major periods of California prehistory: Pre-Archaic, Archaic, and Pacific. Regionally refined chronologies such as the CCTS and its evolutions through various cultural schemas have aided investigators in better understanding local cultural patterns and defining local chronologies, thus enabling scholars to move away from addressing cultural data in broad terminologies and classifications. Table 3 summarizes the cultural patterns for the project region.

TABLE 3
Chronological Summary

Time Period	Site Type	Chronological Markers
Paleo-Indian10,000 to 3,000 BC	Small mobile populations hunting big game	Large, fluted lanceolate projectile points or spear/atlatl/dart points
Windmiller Pattern 3,000 to 1,000 BC	Increase in population densities with sedentism and diversified use of ecological zones. Cultural presence is established for the project area in this period.	Use of milling stones, fishing and hunting technologies, and extended burials oriented to the west.
Berkeley Pattern 1,000 BC to AD 750	Continuity of site types from earlier and later periods, with addition of mortar and pestle and smaller arrow projectile points	Change in projectile point typology with introduction of bow and arrow, mortar and pestle, and circular shell fish hooks, a marked preference for flexed burials versus extended burials.
Augustine Pattern AD 750 to AD 1769	Increase in sedentary populations, permanent settlements, and full exploitation of natural resources, stored staple foods, long trade networks, and complex political systems	Bow and arrow replaced atlatl, small projectile points, well-developed midden deposits, cremated and intact human burials, residential features, bedrock mortar milling stations, smaller milling stone use, olivella, and clamshell disc beads

Temporal placement of prehistoric sites is essential for developing a chronological sequence pattern for regional archaeology. If an unanticipated archaeological site is identified as a result of OGS construction, information from that site when compared with other sites within the project region, may contribute to additional local understanding. Data recovered from the archaeological site (e.g., diagnostic artifacts, features, and organic debris) would assist in establishing an interpretation of the occupational time period and the chronological sequence of the site for comparison to regional information. Standard approaches to stratigraphic interpretation include radiocarbon assay, source-specific obsidian hydration, and cross-dating temporally diagnostic artifacts with those recovered from surrounding areas. These stratigraphic interpretations determine the site's habitation era and functionality, and allow the site to be compared with regional sequences.

Generally, chronological research questions for California concern similarities and differences between the ethnohistoric cultural groups and their use of the many environmental and ecological regions. For the OGS region, chronological research questions are concerned with defining data that clearly establishes the first occupation of this territory. Of particular interest to researchers are identifying site types and chronological patterns, based on lithic technology and other artifact typologies, and chronologies and assemblages. Key research questions applicable to sites potentially discovered in the project area might include the following:

- Do the diagnostic artifacts fit the chronological pattern set forth in the CCTS? Do diagnostic artifacts fit chronologically with outside prehistoric territories?
- Does the artifact assemblage establish site type or function?

- Were the site and its loci occupied for one short or long episode, or were they occupied episodically during multiple habitation episodes?
- Does the site occupancy era relate to the cultural sequences developed for the region, or to that seen in other sites in the area?
- What significant changes in subsistence patterns and patterns of technological use validate the chronological schemes that archaeologists have devised for the local prehistory?
- Can predictive models for site formation be formulated for the cultural groups in the Central Valley or Coastal Range based on known site distributions and use of resources?

Data Sources

Data requirements for defining a cultural chronological sequence and temporal dating would include recovering diagnostic formed tools such as projectile points established within specific cultural patterns, shell or stone beads and ornaments, and artifacts that qualify for cross-dating typologies and radiocarbon dating of archaeologically organic remains (i.e., shell, bone, or charcoal) associated with the archaeological deposits. Data that could be obtained that would define a specific cultural pattern would include flexed burials, cremations, fishing technology, and carbon dating to AD 700, all markers and cross-dating typologies of the Augustine Pattern.

If a discovery occurs, site treatment and mitigation will proceed as directed by the CPM pursuant to CUL-7. If there is a discovery, the following process is suggested as a way to proceed, depending on the nature of the discovery and specific directions from the CPM:

Formed tools will be collected for analysis from the surface and subsurface matrix and will be placed in clear polyethylene zip-lock bags. Charcoal and soil samples will be taken from subsurface hearth features, charcoal and ash lenses, or other in situ contexts. Sample materials will be collected with clean metal tools and will be wrapped in aluminum foil and placed in clean zip-lock polyethylene bags. Shell and bone will be collected from the surface and subsurface matrix and will be placed in clean plastic vials; large or wet bones will be placed in clean paper bags, if necessary. Delicate items, such as obsidian artifacts or shell beads, will be carefully collected and wrapped in non-acidic tissue paper, if necessary, to prevent damage.

All items recovered from an excavation will be clearly labeled with the site number, unit number, level, associated feature, date, and collector's initials. Perishable artifacts, if found and recovered from wet contexts, will be kept wet until appropriate long-term conservation measures are applied to ensure their stability in a repository or museum collection.

If a discovery occurs, the following field methods are recommended. No fieldwork will be allowed to proceed without direction from the CPM pursuant to COC CUL-7.

Field methods for collecting artifacts from a newly discovered prehistoric archaeological deposit will include the excavation of 1-meter-by-1-meter units or expanded unit blocks (see below). Matrix will be dry or wet screened, as appropriate, through 1/4-inch and 1/8-inch screen inserts when deemed necessary (to recover fish bone and very small lithic material and to recover shell beads in areas where these items are likely to occur). Shell, lithics,

ground stone, bone fragments, and fire broken or affected rock will be sorted, bagged, and labeled. If required, residue material located in the 1/8-inch mesh screen will be double-bagged, labeled, and retained for water screening. From water screens, all lithics, bone, modified shell, the hinges of bivalve mollusks, and the apices of gastropod shells will be saved. Each material type from dry or water screening will be bagged and labeled separately in clear zip-lock polyurethane bags.

A unit level record form that includes features, in situ cultural materials, tallies of recovered items, a sketch of the surface at the base of the level, and a description of sediments and other items of interest will be filled out for each 10-centimeter level of each 1-meter-by-1-meter unit. The types of features that may be excavated include hearths, house floors, cache pits, and artifact concentrations. Excavation and recordation of these features will follow industry standards, including documenting and recording data such as provenience, description, depth, and collecting soil and charcoal samples. Each feature encountered in a site will be given a feature designation sequential number. Feature forms will also be used for recording data and observations and for mapping each feature. Photographs will be taken throughout the excavation process. Field methods are discussed further in Section 6.

Artifacts and ecofacts to be collected and curated will provide information regarding a cultural chronological sequence and temporal dating. The collection will include, if present, formal tools, beads and ornaments, and organic remains such as shell, bone, and charcoal. Obsidian will be collected, if found, as it can be used to develop hydration chronologies. Charcoal and soil samples will be taken from any subsurface hearth features, charcoal and ash lenses, or other in situ contexts, if possible; such samples can be used to temporally place site occupation in local or regional chronologies. Some proposed analyses are destructive; however, when possible, artifacts and ecofacts that are analyzed will be curated after analysis is complete. Many dating techniques continue to improve in precision and accuracy, and new developments and improvements in these techniques and technologies could provide additional information at a later time. Curation methods are discussed further in Section 6.12.

5.1.7 Subsistence Economics and Prehistoric Settlement Patterns

Archaeology in the western United States has become, to a large extent, the study of settlement systems and subsistence economics (land use) of hunter-gatherer peoples. Although many topics of archaeological interest exist that do not touch directly on these areas, the most compelling research problems and issues are directly or indirectly related to them. Archaeologists have addressed these issues through what may be called the bipolar models of settlement systems and subsistence economics. These models develop and correlate postulates on hunter-gatherer residential mobility, subsistence logistics and foraging patterns, the energetics and temporal costs and benefits of getting food, seasonality, and food storage patterns. The models are based on global and local analyses of ecological energetics, resource distribution, and resource accessibility. The models include postulates of the archaeological correlates of various economic and settlement patterns and approach a general theory of hunter-gatherer settlement systems and subsistence economics. The models can also provide a framework for any work done on prehistoric sites discovered at the project site.

Bipolar models of settlement systems have a long history in archaeological theory. Archaeologists have often thought of hunter-gatherer settlement and subsistence systems as capable of being placed on a bipolar continuum with "intensive" systems or strategies on one end and "extensive" ones on the other (Cleland 1966). More recently, archaeologists have used the terms "traveler" and "processor" (Bettinger and Baumhoff, 1982) or "forager" and "collector" (Binford, 1980; Kelly, 1983) to refer to different versions of the same general continuum. The terms forager and collector are the most commonly used. In the simplest form of this dichotomy, foragers move their residential bases frequently to track resources that are evenly dispersed in time and space. Collectors move to special activity camps on logistical trips from more stable residential bases to resources whose production is patchy in space and seasonally restricted in time.

Bettinger and Baumhoff's (1982) traveler-processor dichotomy contrasts subsistence-settlement strategies under which people spend time to travel to high-quality resources, versus those under which they spend time processing a broader spectrum of resources including lower-quality resources. They explain the spread of Numic-speaking peoples in the Great Basin as the displacement of a traveler society by a processor one.

In his ethnographic study of hunter-gatherer mobility worldwide, Kelly (1983) focuses on the spatial and temporal structure of resources in determining a settlement and land-use pattern. He found that a hunter-gatherer band's number of residential moves per year is correlated to its territory's effective temperature (a measure of seasonality that takes into account the amount and annual distribution of solar radiation); also, he found that the average distance of residential moves is inversely correlated to effective temperature. In other words, tropical hunters move residential bases more often but at less distance. This pattern holds because in tropical forests, food resources are evenly distributed and poorly accessible (most resources are in the tree canopy or are well protected by adaptation from predation). Conversely, Binford (1980) nominated the Nunamiut Eskimo as a quintessential "collector" society. The Nunamiut response to high seasonal and spatial variation in resource productivity in the arctic environment was to take logistical forays to special activity sites from residential bases that were infrequently (<10 times per year) moved. Binford (1982) also found that the Nunamiut rotated their annual range every 5 years or so between five subranges within a very large extended territory, which they continually monitored on forays from the currently active range.

Population density and food production intensity are also important variables that determine some aspects of hunter-gatherer residential mobility. According to foraging theory, people will add additional resources to their diet as population densities increase (Christenson, 1980). These additional resources are usually less preferred because they offer lower return on labor. Certain kinds of subsistence economic transformations, such as agriculture, involve very large labor commitments but cause a sudden jump in productivity. People have no choice but to reduce mobility when more densely packed in a given land area. This mobility reduction lessens their access to a wide diversity of resources, particularly scarce ones such as lithic raw material, as well as some food resources. One response to this lessened access is increased intergroup trading.

The archaeological correlates of residential mobility and land use patterns are also considered in the bipolar model. Binford (1980) proposed a simple standard typology of site types based on assemblage diversity. For example, assemblage diversity should be high at

residential bases, particularly those that are occupied for a long duration (such as during winter), because a variety of tasks are carried out there (Shott, 1986). Logistical camps, special extraction locations such as wood gathering spots, and information gathering stations such as lookouts (Binford, 1980) should have low assemblage diversity or be archaeologically invisible. Also, tool use becomes more expedient in general as mobility decreases and there is less need to care for specialized tool kits used on long distance task forays for specialized resource procurement purposes. Kelly (1983) suggested that tool technology under these conditions (particularly with agricultural societies) becomes less dependent upon bifacial reduction techniques. Archaeological assemblages should show a lower frequency of bifacial reduction and thinning flakes, a higher percentage of unprepared percussion cores, and cortical flakes.

Property types important to research within the project area include the following: (1) the long-term residential base; (2) the short-term occupation site; (3) the resource procurement site; and (4) the resource processing site. The archaeological resources of the project area will be analyzed relative to these property types. Important factors include the frequency of each property type by chronological period, the size of each property, and the location of the property type on the landscape. The four primary property types are discussed in some detail in the subsequent paragraphs.

Long-term Residential Base

The long-term residential base is the main residence for a specific portion of the aboriginal population, similar in concept to the hamlet, town, or village in Euro-American history. People residing in these property types tend to form communities with considerable face-to-face interaction over an appreciable span of years.

In general, this property type is expected to contain a broad range of tool types because more activities are undertaken at the property and some of the leisure time available at the home base would be used for tool finishing and rejuvenation activities. Projectile point bases diagnostic of culture and chronology are likely to be present in higher frequencies in the residential base than at other sites because hunters have removed them from the kill and brought them home for repair or alternate use. Artifacts reflecting status and prestige are expected to be present if status and prestige segregation are operant in the society. Sites of this type are expected to be large and deep, to contain more features, and to reflect the internal organization of specific activities (Binford, 1980).

In summary, the long-term residential base property type displays a greater range and quantity of research values than other site types characteristic of the cultural system (Andrefsky, 1998). Features and diagnostic artifacts are more abundant. Site depth and midden deposits are characteristic, and property visibility on the landscape is likely to be high because considerable “living,” and the residue that such activity produces, has been undertaken at these locales. Cemeteries or isolated burials are likely to be located nearby. These properties are integral in research schemes because they form the basis for integrating other, more focused-purpose sites into a single operating cultural system.

Short-term Occupation Site

The short-term occupation site is the second property type important for understanding human adaptations in the project area. This property type is a key element because these sites have the potential for demonstrating a subsistence behavior shift with definable chronological limits because aboriginal Americans exploited available riparian communities. In other words, field camps or seasonal camps and resource processing sites would proliferate near the riparian resources, and these sites would cluster temporarily because increased exploitation would occur when the wetland was present (Binford, 1980).

The short-term occupation site is especially useful for investigating human adaptation to riparian and upland communities because the site possesses the classic characteristics of "small sites" with the potential for chronological control. These sites are discrete, relatively easy-to-define reflections of human behavior that are not confused by subsequent occupation for different purposes. The sites are expected to be relatively shallow and to contain a narrow range of tool types that reflect the specific activity undertaken at the site. Short-term occupation sites are smaller than long-term residential bases and have less abundant and more uniform types of features because the camps were formed by one segment of the residential base population as a specific task was undertaken at a specific time. A narrower range of floral and faunal remains is also expected and may reflect subsistence focus and seasonality of use. As Murdock (1968) has stated, "it has long been recognized that the form, size and fixity of human settlement bear a direct relationship to the modes of exploiting the natural environment to provide subsistence."

Resource Procurement and Resource Processing Sites

The last two property types important in understanding and researching historic contexts are the resource procurement site and the resource processing site. These site types are generated with respect to specific types of target resources. Task groups seek specific foods or other economic resources in specific contexts (Binford, 1980). The use, exhaustion, and abandonment of tools at resource procurement and, secondarily, at resource processing sites would occur at a very low rate, yielding property types characterized by diffuse, low-density remains. Tools, if present, are expected to represent only a single function or a narrow range of functions reflecting the specific activity undertaken at the site. In addition, a narrow range of artifact classes is expected. These property types tend to have low visibility on the archaeological landscape and also tend to be classified as "isolated finds." One exception to this trend is bedrock milling stations. These stations remain visible on the landscape because of their typical association with bedrock exposures, which stand out from the surrounding areas by their starkness.

Key research questions concerning resource procurement and resource processing are presented and discussed below:

- What was the relative importance of various food resources through time? Early subsistence may have focused mainly on large terrestrial game animals, which might be indicated by lack of ground stone and assemblages of low diversity, whereas later subsistence regimes may have focused mainly on fishing, collecting shellfish, and hunting sea mammals.

- Were site occupants foragers or collectors? Did settlement patterns change through time? Property type along with tool, feature, and faunal assemblages are the important data categories needed for addressing these questions. If a foraging subsistence strategy is employed, sites have much the same content because the full range of activities is undertaken by the population base. If a collecting strategy is active, the settlement system comprises residential bases and smaller specialized collection sites where specific tasks are undertaken by a subgroup of the residential base, possibly by only adults of one gender. The tool and feature assemblages should specifically reflect the collection task and should not contain a full range of tools and features, as would assemblages of a residential base. Information is needed on subsurface cultural assemblages, including buried cultural components and features.
- Was diversification in the subsistence base evident between different occupation periods within the project area? Taxonomic and statistical analyses of archaeobotanical and faunal data are the primary sources for defining diet breadth and the importance of vegetal foods, marine resources, and small and large game in the aboriginal diet. Another source of information is an analysis of formal and informal tools.
- Did changes in the technological subsystems occur that would indicate subsistence diversification? For example, an increased frequency of milling equipment could indicate an increased reliance on plant or small mammal resources. Conversely, a decrease in milling equipment could indicate a reliance on other food sources.

Data Sources

Data requirements for these questions would include preserved food remains (fish bone and other faunal remains) in stratified sites. Equally important would be an extensive representation of artifacts used in the hunting, gathering, and fishing for important local food resources and evidence of their manufacture. The surfaces of projectile points and knives could yield identifiable blood residues of sea or land mammals.

Artifacts and ecofacts to be collected and curated will provide information about settlement patterns and subsistence strategies and will include representative samples of all major artifact types, such as flaked and ground stone, animal bone, shell, beads, charcoal, and seeds. Shell remains and fish bones can provide information related to seasonal occupation. Other faunal remains can provide information about subsistence strategies; these remains would be curated after analysis. Charcoal and soil samples taken from subsurface hearth features, charcoal and ash lenses, or other in situ contexts can be used to establish ranges of site occupation. One-liter samples of midden and soil samples from subsurface hearth features, charcoal and ash lenses, or other in situ contexts will be collected. Fire-modified rock will be weighed, counted, and discarded in the field and will not be collected or curated. Some proposed analyses are destructive; however when possible, artifacts and ecofacts that are analyzed for information about this research question will be curated after analysis is complete. Many techniques continue to improve in precision and accuracy, and new developments and improvements in these technologies could provide additional information at a later time. Curation methods are discussed further in Section 6.12.

5.1.8 Technology

Interesting questions concern associations between technology (lithic and bone) and mobility patterns, the association between lithic and bone tool assemblage diversity, and the distribution of stone tool or bone tool waste by type and the site's function. Questions to determine the technology level for a given period include the following:

- What was the timing of the advent of the bow and arrow? Was it a sudden introduction (ca. 1500 BP) or was it used concurrently with the atlatl and dart before the introduction of the bow and arrow? How did bow-and-arrow hunting change hunting patterns and hunting tactics?
- What raw materials were selected for use in biface tool trajectories and uniface tool trajectories during the chronological periods represented in the project area? Are differences noted in the archaeological assemblages across cultural periods? Can raw material selection be used as a blunt instrument for chronological and cultural implications? How does the pattern defined for the project area compare with other documented assemblages in the region? Biface and uniface tools, implements broken during production, and debitage are the appropriate data classes for addressing these questions. Quantitative and statistical analyses can be used to provide summary data and reliability of conclusions.
- Do the tools reflect a core-based strategy, a flake-based strategy, or a split cobble-based technology? The introduction of the bow and arrow around A.D. 500 may have favored a flake-based tool production strategy for arrow points as compared with the larger, earlier dart points.

Data Sources

Data requirements for these questions would include large samples of debitage, stone tools, and bone or wood tools. Such samples might consist of more than 500 pieces of debitage and more than 50 bone or wood tools—all well dated and correlated with other key cultural traits.

Artifacts and ecofacts to be collected and curated will provide information about technology and will include formal and informal tools, cores, and the waste produced during manufacture, maintenance, and use of the aforementioned tools. If the sample of debitage is large (i.e., more than 500 pieces), and the CPM concurs, all formal tools and a representative sample of informal tools, waste flakes, and shatter will be curated. Smaller collections will be curated in their entirety. Additionally, beads and worked shell, if found, would provide information regarding technological strategies. Some proposed analyses are destructive; however when possible, artifacts and ecofacts that are analyzed to provide information for this research question will be curated after analysis is complete. Many techniques continue to improve in precision and accuracy, and new developments and improvements in these technologies could provide additional information. Curation methods are discussed further in Section 6.12.

5.1.9 Cultural Affiliation and Exchange

Regional and interregional trade patterns have at least two primary levels of influence on native cultures. First is the exchange of commodities necessary for subsistence, such as food items and toolstone materials, among others. Also to be considered are the societal effects engendered by face-to-face contact and intermarriage. Settlements within a networked exchange system retain greater flexibility for withstanding local shortages in food or other supplies through the redistribution of locally abundant commodities along the network. In addition, an overabundance of resources such as acorns, pinyon nuts, fish, or domesticated crops in one area could be used to ameliorate food shortages in another locale, facilitating stability in settlement systems, with the exchange to be repaid at some other time when circumstances are different. The societal value of this type of exchange system, therefore, is to optimize the environment's productivity across an ethnic region. This system would provide stability in settlement and other cultural systems and maintain access to critical subsistence resources that may not be consistently available annually and to other resources or locales of importance to the ethnic group (Chartkoff and Chartkoff, 1984).

A second influence of trade on native cultures focuses on the exchange of exotic items and the concomitant interfacing of peoples of different ethnic backgrounds, traditions, and religious beliefs. Peoples or settlements brokering exchange on the perimeters of ethnic regions are more likely to be influenced by intercultural contact and to be the source of influence in their separate ethnic spheres.

Items of interregional trade may be valuable because of their limited quantities and the investments of time and labor involved in delivery. They may be more likely found in specialized contexts associated with long-term residence. Burial or cemetery locales, ceremonial and religious sites (e.g., rock art), and occupation or burial sites are the property types most likely to contain items important to the resolution of research questions in this context. Key research questions concerning cultural affiliation and exchange are as follows:

- How did trade patterns of lithics, beads, and other non-perishable materials change during the transition one prehistoric period to another?
- Ethnographic accounts tell of long-distance trade between coastal groups and inland peoples of California's central valleys. Coastal shell bead money was traded as far inland as the Great Basin of Nevada and Utah. Items of Sierra Nevada or Great Basin origin (obsidian) may have ended their exchange travels at coastal sites. Does material evidence of these contacts exist in archaeological sites?

Data Sources

Trade items found in a datable context can be indicators of trade periods, while analysis of artifacts such as obsidian can identify most sources of origin, which typically are from California, Oregon, and Nevada. Shell artifacts and ecofacts can be speciated and traced to specific freshwater and saltwater sources.

Artifacts, if found, will be collected and curated to provide information about cultural affiliation and trade, and will include items such as those listed above. Shell beads and other ornaments will be collected and curated. Obsidian will be collected and sourced to determine its point of origin. Some proposed analyses are destructive; however, when

possible, artifacts that are analyzed to provide information about this research question will be curated after analysis is complete. Many techniques continue to improve in precision and accuracy, and new developments and improvements in these technologies could provide additional information. Curation methods are discussed further in Section 6.12.

5.2 Research Questions and Data Sources for Historic Archaeological Resources

Previous historical archaeological work has contributed to developing a series of research issues that provide a context for evaluating historic-period sites and reflect current trends for regional prehistory. Research issues pertinent to the project area include early exploration and Euro-American contacts with the Miwok, early natural resource exploitation (fishing, mining, and logging), early household structures/consumer behavior/social and economic status, and early development and economic market of local small-scale subsistence agricultural and dairy communities. If an unanticipated historic-period site is identified during construction, the following general research questions and methods can guide the final research design.

5.2.1 Household Structure, Consumer Behavior, Socioeconomic Status

This theme involves studying individual households and the response of each to economic and social conditions of the time. Concepts relevant to household studies include household composition, life cycle, income strategy, and status. Consumer behavior and social and economic status at domestic sites can be studied through examining refuse and refuse deposits associated with specific households.

Research questions related to household structures, consumer behavior, and social and economic status include the following:

- How does the domestic debris from this historic-era site help us understand rural lifeways that may have been associated with small-scale agriculture in the middle 19th, late 19th, and early 20th centuries?
- What do the remains of the historic-period household structure or outbuildings reveal about the inhabitants' economic status? What does the domestic refuse reveal about the inhabitants' consumerism and economic status?
- Does recovery of artifacts or structural remains from the historic-period site provide information on a specific ethnic group's social and economic status?

Data Sources

Useful indicators of consumer behavior and economic status include materials amenable to subsistence-related activities such as faunal remains, ceramics, and glass that indicate procuring and consuming food. Furthermore, domestic items such as ceramics, utensils, personal items, and luxury items may indicate economic status. Analyzing historic-era artifacts can allow the archaeologist to draw conclusions about site inhabitants' social class, ethnicity, and quality of life compared with the remains from other sites. Other data sources include structural remains and historic records.

If a discovery occurs, the following field methods are recommended. No field work will proceed without direction from the CPM pursuant to COC CUL-7.

If the CPM concurs, site sampling plans will include the recovery and analysis of historic-period materials such as subsistence-related artifacts, including glass, ceramics, metal, and faunal remains. If structures or features are identified during test unit excavations, units will be expanded to expose the collected artifact material's feature and when it was recorded, mapped, and photographed. Field method procedures are discussed above and in Section 6.

5.2.2 Early Development of Agricultural and Dairy Communities

Small-scale agriculture, dairy farming, and ranching were important in the development and support of local populations. Research questions related to early agricultural and ranching communities include the following:

- What were the ethnic, social, and class makeup of agricultural and ranching communities within Contra Costa County?
- How did ranching and agricultural technology and practices change through time?

Analysis of historic-era artifacts (faunal remains, ceramics, glass, metal, and cans) can allow the archaeologist to draw conclusions about the site inhabitants' social class, ethnicity, and quality of life, compared with the remains from other sites. Agricultural and ranching technologies can be identified from features or artifact material, such as machinery remnants, structures, or windmill remains. Other data sources would include historical records.

Data Sources

If a discovery occurs, the following field methods are recommended. No field work will proceed without direction from the CPM pursuant to COC CUL-7. Site sampling plans will include the recovery and analysis of historic-period materials such as subsistence-related glass, ceramics, metal, and faunal remains. If features or structures are identified during test unit excavations, units will be expanded to expose the extant of the feature, and it will be recorded, mapped, photographed, and the artifact material will be collected (domestic refuse). Field method procedures are discussed above and in Section 6.

Artifacts and ecofacts, if found, will be collected and curated to provide information about early agriculture and historic-period dairies and will include historic-period artifacts such as glass, ceramics, metal, and faunal remains. Artifacts such as undifferentiated metal or glass fragments will be collected but may be discarded after analysis is complete. Specifically, unknown metal fragments that do not contain rivets or other fasteners or any defining features will not be curated. Glass fragments that do not exhibit seams, embossing, or other features and are not bases or rims will not be curated. Some proposed analyses are destructive, but when possible, artifacts analyzed to provide information for this research question will be curated after analysis is complete. Many techniques continue to improve in precision and accuracy, and new developments and improvements in these technologies could provide additional information at a later time. Curation methods are discussed further in Section 6.12.

5.3 Data Collection Procedures

If a discovery occurs, the following data collection procedures and field methods are recommended. The CPM will assess significance and identify mitigation pursuant to CUL-7. Necessary field work will proceed only after direction from the CPM. Prehistoric stone tools will be collected for analysis from the surface and subsurface matrix and will be placed in clear polyethylene zip-lock bags. Shell and bone will be collected from the surface and subsurface matrix and will be placed in clean plastic vials; large or wet bones will be placed in clean paper bags, if necessary. All items recovered from an excavation will be clearly labeled with the site number, unit number, level, associated feature, date, and collector's initials.

Field methods for collecting artifacts from a newly discovered prehistoric archaeological deposit will include the excavation of 1-meter-by-1-meter units or expanded unit blocks. Matrix will be simultaneously screened through 1/4-inch inserts (and 1/8-inch screen inserts when deemed necessary to recover shell beads, fish bone, and pressure flakes). Shell, lithics, ground stone, bone fragments, and fire broken or affected rock will be sorted, bagged, and labeled. Residue material in the 1/8-inch mesh screen will be double-bagged, labeled, and retained for water screening. From water screens, all lithics, bone, modified shell, the hinges of bivalve mollusks, and the apices of gastropod shells will be saved. Each material type from dry or water screening will be bagged and labeled separately in clear zip-lock polyurethane bags.

Soil samples will be collected for pollen and phytolith analysis. Column samples will be collected in 10-by-10-centimeter samples from each unit. Each 1,000 cubic centimeters of matrix will be placed in a clean, clear, zip-lock polyethylene bag and labeled. The samples will be transported to a laboratory for processing. A subset of these samples will be evaluated in the laboratory as part of the site analytical reporting process to determine whether they produce any charcoal that can be used for macrobotanical analysis. If the sample contains preserved charred seeds, then additional soil samples will be analyzed to obtain a representative sample of charred seeds from the site. Specific sample sizes and analytical procedures will depend on the site-specific testing or mitigation plan developed at the time of site discovery.

The types of features to be excavated include hearths, house floors, cache pits, and artifact concentrations. Excavation and recordation of these features will follow industry standards, including documenting and recording data such as provenience, description, depth, and collecting soil and charcoal samples. Each feature encountered in a site will be given a feature designation sequential number. Feature forms will be used for recording data and observations and for mapping each feature. Photographs will be taken throughout the excavation process. Field methods are discussed further in Section 6.

Generally, artifacts and ecofacts to be collected and curated will provide information about each data set discussed above. The majority of the collected artifacts and ecofacts will be curated. Fire-modified rock will be weighed, counted, and discarded in the field and will not be collected or curated. Historic artifacts such as undifferentiated metal and glass fragments will be collected but may be discarded after analysis and will not be curated. A representative sample of collections of debitage, which consist of more than 500 artifacts,

may be curated rather than the entire collection. Smaller collections will be curated in their entirety. Artifacts or ecofacts submitted for non-destructive analyses will be curated when the analysis is completed; artifacts or ecofacts submitted for destructive analyses will by definition not be curated. Many techniques continue to improve in precision and accuracy, and new developments and improvements in these technologies could provide additional information at a later time.

SECTION 6

Avoidance, Monitoring, and Mitigation

Monitoring and mitigation of significant effects to cultural resources will require a number of activities that may (1) prescribe measures to ensure avoidance of resources, or (2) compensate for the loss of significant cultural resources because of unavoidable impacts resulting from the exigencies of a project's construction, operation, or decommissioning. Mitigation measures are imposed by means of COCs and are designed to minimize impacts on any kind of significant cultural resource, whether it is an element of the built environment, an ethnographic property, or an archaeological site. Projects whose design cannot be changed to avoid known or newly discovered significant cultural resources will have COCs that specify detailed mitigation activities. Mitigation measures for discoveries will be addressed under CUL-7.

6.1 Avoidance

No known cultural resources exist within the project area; therefore, no sensitive areas exist that should be avoided during construction or operation.

6.2 Monitoring

The objectives of monitoring are following:

- Protect extant significant historic buildings, structures, sites, or objects from construction impacts
- Identify, at the time of discovery, any archaeological materials exposed during ground disturbance
- Protect such resources from damage while the CRS makes and provides eligibility review and approval recommendations for the CRHR to the CPM.

For the purposes of this CRMMP, archaeological construction monitoring is defined as on-the-ground, close-up observation by a CRS, alternate CRS, or CRM meeting the qualifications prescribed in CUL-1, who watches for any kind of archaeological remains that might be exposed by machines during ground-disturbing construction activities, and as defined in CUL-6. These activities include, but are not limited to, mechanical boring, grubbing, scraping, grading, and excavating. The CRS, alternate CRS, or CRM attempts to define and identify any discovered archaeological finds; halts construction in the vicinity of a finding to evaluate it; and keeps a daily log of construction activities observed and archaeological finds made. The CRS, alternate CRS, or CRM sets out flagging or fencing to create a buffer zone around known or discovered cultural resources signifying that ground-disturbing activities are not allowed in those locations. The monitor checks that the flagging and fencing remain a visible and effective barrier until project activities have been completed near the resource. Full-time archaeological monitoring is defined as careful

observation of the ground-disturbing activities of all machines on a construction site for as long as the machines are being operated. Full-time archaeological monitoring, as defined in CUL-6, may require more than one monitor working at a time, depending on how many machines are working and how far apart they are. If one monitor cannot observe all ground disturbances at the same time, then additional monitors will be assigned so that all ground disturbance can be observed.

In the event that the CRS determines that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring will be provided to the CPM for review and approval prior to any change in the level of monitoring.

Cultural resources discovered during mobilization or construction may include, but are not limited to, the following types of physical remains:

- Prehistoric cultural resources are defined as isolated occurrences or clusters of artifacts, features, and human burials that are evidence of the activities of Native American peoples in the past. Indicators of prehistoric and protohistoric occupation by Native Americans include, but are not limited to, artifacts of various natural materials, areas of soil discoloration, shell, animal bone, manuports, heat-altered stone, and human bone. Occurrences of prehistoric materials may include, but are not limited to, the following:
  - Artifacts (projectile points, shell beads)
  - Habitations (house pit depressions, shell or midden deposits, fire-affected rock, heat-treated rock, manuports)
  - Features (hearths, stone features, artifact caches)
  - Human remains (burials or isolated bone fragments)
- Historic cultural resources are defined as isolated occurrences or clusters of artifacts, features, and structures or their remains, at least 50 years of age (or exceptional, or having Native American religious significance), which are evidence of the activities of peoples of all ethnicities of the American historic period. Historic-period materials may include, but are not limited to, the following:
  - Buildings and structures or their remains
  - Native American sacred sites or other significant ethnic sites of any age
  - Trash pits, privies, wells, and associated artifacts, surface dumps, and artifact scatters
  - Isolated artifacts or isolated clusters of artifacts (metal cans, glass bottles, ceramic vessels)

The various resource specialists and onsite monitors, including the Paleontological Resources Specialist, the Designated Biologist, all Paleontological Resources Monitors (PRMs), and all Biological Monitors, will be informed of the procedures to be followed if they observe cultural material while monitoring ground disturbance, as follows:

- PRMs and Biological Monitors should not pick up items that may be cultural.
- If PRMs and biological monitors observe cultural material, they should secure the area and inform the CRM immediately.

The CRMs will be instructed to reciprocate. If a CRM observes cultural material that a PRM or Biological Monitor should see, then the CRM will secure the area and inform the PRM or the Biological Monitor.

6.3 Native American Participation

Pursuant to COC CUL-6, provisions will be made for the participation of a Native American monitor during ground-disturbing activities if Native American artifacts are encountered during ground disturbance. The Native American monitor will act as a liaison between Native Americans and archaeologists, developers, contractors, and public agencies to ensure that cultural features are treated appropriately from the Native American point of view. This provision will help others involved in the project to coordinate mitigation measures.

If human remains are discovered during the course of monitoring or mitigation activities, then the specific protocol, guidelines, and channels of communication outlined by the NAHC (1991), and in accordance with Health and Safety Code (HSC) Section 7050.5 and Public Resources Code (PRC) Section 5097.98, apply. Section 7050.5(c) will guide the potential Native American involvement as follows:

> If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she will contact by telephone within 24 hours the Native American Heritage Commission.

After notifying the coroner, the CRS will notify the CPM, and as a courtesy the Native American Heritage Commission.

Under typical circumstances, the NAHC will then notify the Most Likely Descendent(s) (MLD) of the discovered remains. The MLD has 48 hours after being granted access to the construction site to make recommendations to the project owner regarding treatment and disposition of the identified remains. The project owner will notify the CPM of the recommendations made by the MLD and the proposed actions to mitigate the impact in accordance with CUL-7.Pre-construction Mitigation of Known Cultural Resources

There are no known cultural resources within the project area of analysis that require mitigation.

6.4 Monitoring Requirements

At the direction of the CPM, the applicant will ensure that full-time cultural resources monitoring is conducted of ground-disturbance activities in the project area where CRHR- or NRHP-eligible cultural resources have been discovered. Eligibility will be determined by the CPM.

Full-time archaeological monitoring will performed for all earth-moving activities. Full-time archaeological monitoring will require one monitor per active earthmoving machine working in archaeologically sensitive areas, as determined by the CRS in consultation with the CPM. If an excavation area is too large for one monitor to effectively observe the soil removal, one or more additional monitors will be retained to observe the area.

6.4.1 Procedures for Inadvertent Discoveries of Archaeological Materials

Although no cultural resources have been identified within or immediately adjacent to any other project impact area, in the event that there is an inadvertent discovery of archaeological materials, pursuant to CUL-7, the CRM will notify the CRS, who, in turn, will notify the project owner and the CPM within 24 hours of discovery or by Monday morning if the cultural resources discovery occurs between 8:00 a.m. on Friday and 8:00 a.m. on Sunday morning. The project owner will ensure that work is halted should there be a discovery on the project site or linear facilities. Redirection of ground disturbance will be accomplished under the direction of the construction supervisor, in a manner agreed to by the CRS.

Archaeological materials may include, but are not limited to, items such as whole or fragmentary, flaked or ground stone tools; stone flaking debris; discolored, fire-altered rock; animal bone; charcoal; ash; discolored, burned earth; rocks and minerals not common to the project site; and fragments of ceramic, glass, or metal. If cultural resources more than 50 years of age , and not subject to prescriptive treatment are found, or impacts on such resources can be anticipated, construction will be halted or redirected in the immediate vicinity of the discovery such that the resource is protected from further impacts. The halting or redirection of construction shall remain in effect until the CRS, a CRM, or appropriate cultural resources technical specialist has made evaluations of the historical significance of the discovery (CUL-7). The recommendations of significance will be substantiated and reported to the CPM by the CRS.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS will constitute non-compliance with the COC for this project.

6.5 Monitoring Personnel and Project Communications Procedures

Pursuant to COC CUL-1, the CPM has approved the resume(s) of the designated CRS—Clint Helton, RPA. Replacement of the CRS will be conducted according to COC CUL-1. If the CPM rescinds approval of a CRS, the project owner will replace the CRS in accordance with COC CUL-1.

The CRS has verified that the following designated CRMs meet the requirements of COC CUL-1. The designated CRMs for the project are Phil Reid, Henry Davis, and Daniel Ewers. Resumes are provided in Appendix C. The names of additional monitors, verified by the CRS pursuant to COC CUL-1, may be submitted during the course of the project with a statement that the additionally proposed CRM meets the qualifications in CUL-1. The CRS

will submit the resume of any necessary specialist to the CPM for approval pursuant to COC CUL-1. If the CRS is replaced, the project owner will submit an addendum to the CRMMP indicating the name of the new CPM-approved CRS.

The CRS will be responsible for overall implementation of the construction monitoring program. Pursuant to COC CUL-5, the CRS, or CRMs will conduct onsite worker cultural resources awareness programs. Pursuant to COC CUL-1, the CRS will obtain appropriate specialists, as needed, to guide the evaluation of cultural resources that are discovered. Pursuant to COC CUL-1, the CRS may monitor construction and make periodic field inspections, but the CRS's primary functions will be as follows:

- Direct and coordinate the field activities of the CRMs
- Provide recommendations of eligibility for discovered resources
- Ensure that applicable laws, ordinances, regulations and standards are met
- Serve as a conduit between the project principals (the project owner and the construction supervisors) and the project cultural resources regulators (the CPM and the representatives of other interested parties, such as federal agencies and Native American tribes).

Under CUL-6, each day that no discoveries are made, the CRS, under authority of the project owner, will provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an email or in some other form acceptable to the CPM. This notification will not be necessary during suspensions of construction or after the conclusion of construction. The CRS will also provide a weekly monitoring summary to the project owner, who will include this information in the MCR to the CPM, pursuant to COC CUL-6.

Pursuant to COC CUL-6, the CPM will be notified by telephone or email within 24 hours of any incidents of non-compliance with the cultural resources COCs. The CRS will then recommend corrective action to resolve the problem or achieve compliance with the COCs. When the issue is resolved, the CRS will write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report will be provided in the next MCR for the review of the CPM.

Cultural resources activities related to the project will meet applicable standards and guidelines established by the California State Office of Historic Preservation. The CRS will complete and submit to the CPM a CRR, which will follow contemporary archaeological standards as identified in the Archaeological Resource Management Report (ARMR) guidelines and the COC standards identified in CUL-6. Daily monitoring logs, daily status reports, weekly summary reports of the daily logs, interim monthly status reports, and final reports will be submitted as required by CUL-4 and CUL-6. A sample monitoring log is provided in Appendix D. Site location information forwarded to the CPM must be sent under separate cover with a formal request (pursuant to CEC Regulations) for confidentiality.

Pursuant to COC CUL-7, in the event of an archaeological discovery made during monitoring, the CRS or CRM will halt construction. The CRS will visit and evaluate the find, and the CRS will make a recommendation to the CPM regarding the significance of the find

and, if it is recommended as significant, propose mitigation measures. If the CPM agrees that a find is not significant, the CRS will have the discovery recorded on a DPR 523 form (except for materials less than 50 years old) and will allow construction to resume. If the CPM agrees that the find is significant or rejects the CRS's recommendation that the find is not significant, the CRS and project owner will then submit a treatment plan for the find to the CPM for review and approval (see Section 6.8).

6.6 Workforce Education

Pursuant to COC CUL-5, prior to the beginning of ground disturbance and during all periods of ground disturbance thereafter, the CRS, the alternate CRS, or the CRMs will provide cultural resources training to all new employees within their first week of employment on the proper procedures to follow if cultural resources are uncovered during project excavations. Employees working in ground-disturbing activities will not begin job-related tasks until they have received this training. Training by CPM-approved video is acceptable. Employee education will focus on the following issues:

- Rationale for cultural resources monitoring
- Regulatory policies and laws protecting resources and penalties for violations
- Basic identification of cultural resources
- Procedures to follow in case such resources are discovered

6.7 Work Curtailment Authority and Discovery Treatment Procedures

Pursuant to COC CUL-7, the project owner has granted the CRS, the alternate CRS, and the CRMs the authority to halt ground-disturbing and construction activities near newly discovered cultural resource materials. (For the purposes of this CRMMP, the terms "finds," "cultural resource," "cultural material," "discovery," and "cultural resource materials" are used interchangeably.) Pursuant to COC CUL-7, ground-disturbing activities and construction activities will be halted or redirected if there is a discovery of exceptional cultural material or cultural materials more than 50 years of age, or if a known cultural resource would be affected in an unanticipated manner by the ground-disturbing or construction activities. Ground disturbance will be halted or redirected in the immediate vicinity of the discovery to ensure that the resource is protected from further impacts. If construction workers discover cultural materials, they will immediately halt work in the area and inform the construction foreman or manager, who will immediately halt ground-disturbing activities in the area of the discovery and notify the CRS and CRM, if a CRM is present on the site. A 100-foot buffer zone will be maintained, if possible, until the CRS has been able to evaluate the discovered cultural material.

The CRS acts as the responsible party for cultural resources issues. CRMs will report directly to the CRS. Pursuant to COC CUL-7, the halting or redirection of construction will remain in effect until the CRS and the project owner/construction supervisor have conferred with the CPM and the CPM has determined the eligibility of the discovery and approved mitigation, if necessary. If mitigation is necessary, ground-disturbing activities

and construction activities will remain halted near the discovery until the CPM-approved mitigation has been completed.

6.7.1 Treatment of Cultural Materials Considered Less Than 50 Years of Age

All materials listed below are less than 50 years of age and, unless of exceptional significance, will not be considered cultural resources that merit consideration for recordation or mitigation. If any doubt exists about the age of a historic-period find, the project owner and CRS will discuss this with the CPM when giving notice of the find. The following materials **will not be reported** unless exceptional:

- Plastic products limited to Styrofoam® and other foamed polystyrene products, Velcro®, Teflon®-coated cookware, polyvinylchloride pipe, high-density polyethylene, polypropylene, polyimide, thermoplastic polyester, linear low-density polyethylene, liquid crystal polymers, and products marked with resin codes
- Cans made from aluminum or bi-metal, or those with pull-tab or push-tab (metal or plastic) openings
- Aluminum foil containers
- Synthetic tires or car parts
- Modern electronics (i.e., CD players, VCRs, electronic appliances, personal electronics, computers, and printers)
- Compact disks, floppy computer disks, and magnetic tape media
- Unidentifiable metal fragments
- Rubberized metal
- Clothing or shoes made of plastic or synthetic materials

Monitors or other staff who are examining historic-period materials, especially plastic materials, should have sufficient familiarity to differentiate materials that are more than 50 years old from more recent materials. Although a perception exists that all plastics are of recent production, many plastics were invented and produced in the late 19th and early 20th centuries.

Any materials less than 50 years old that are found with materials more than 50 years old will be reported.

6.7.2 Prescribed Treatment of Archaeological Discoveries 50 Years of Age or Older

All cultural resources more than 50 years old will be recorded on DPR 523 forms and will be mapped and photographed. Not all cultural resources more than 50 years old discovered during construction are significant historical resources under CEQA. Non-significant cultural resources, ineligible for nomination to the CRHR because of lack of integrity or information potential, may be treated prescriptively. The following section lists prescribed

treatments for resources that are limited in value. Resources not on this list cannot be so treated.

Prescribed treatment for the classes of resources more than 50 years old listed in Sections 6.8.2.1 and 6.8.2.2 consists of the following:

- Construction is halted in the immediate vicinity of the find.
- The CRS or CRM records the find on a DPR 523A form, including a location map and a photograph. Artifacts do not have to be collected or curated, but a rough inventory of the resource assemblage will be taken.
- The CRS or the project owner notifies the CPM of the find within 24 hours. The notification includes a description of the resource, a statement that it qualifies for prescribed treatment, and the information that the treatment has been completed.
- Construction can resume when the CPM acknowledges notification of the discovery and approves prescriptive treatment and when the information required for the DPR 523A form has been collected.
- The CRS submits the required DPR 523A form completed for the find to the CPM as an attachment to the next cultural resources monthly summary report, required under CUL-6.

Classes of Prehistoric Archaeological Resources Eligible for Prescribed Treatment

- Small midden remnants (smaller than 1 meter x 1meter) that lack depth (less than 10 centimeters). If charcoal, bone, or other diagnostic elements are found in the midden, or if the deposit is exceptional (greater than 3,000 years old) as determined from associated artifacts, the midden and associated diagnostic elements will be treated under protocols in Section 6.8.4.
- Small clusters (less than 1meter x 1meter) of unidentifiable shell (whole or fragmented). If artifacts, manuports, or other materials are found, the shell and associated deposit will be treated under protocols in Section 6.8.4.
- Non-diagnostic isolated (spatially and temporally) prehistoric artifacts (see Section 6.8.3 for treatment of certain isolated prehistoric finds).

Classes of Historic-period Archaeological Resources Eligible for Prescribed Treatment

- Concrete, brick, or other building materials that lack structural integrity and are part of a documented disturbed (redeposited) context
- Metal, concrete, or ceramic pipes, conduits, or culverts that lack structural integrity
- Non-diagnostic isolated historic artifacts (see Section 6.8.3 for treatment of certain isolated historic-period finds)

Cultural resources deposits containing human remains cannot be treated prescriptively (see Section 6.8.5).

6.7.3 Treatment of Diagnostic and Exceptional Isolated Finds

Certain isolated finds are subject to special treatment. These finds include diagnostic prehistoric artifacts; intact, unusual historic-period artifacts more than 50 years old; and other exceptional artifacts (high quality, unique, or labeled examples, e.g., mortars, pestles, projectile points, ornaments, embossed bottles, decorated or maker-marked ceramic vessels, or dated or/inscribed metal objects). Diagnostic artifacts are items indicative of a particular time or cultural group.

Diagnostic artifacts will be treated as follows:

- Construction is halted in the immediate vicinity, while the CRS or CRM records the find on a DPR 523A form, including a location map and a photograph.
- The isolate will be collected and curated.
- The CRS notifies the CPM of the find within 24 hours. Notice to the CPM includes a description of the resource and a description of the steps taken to determine that it was truly spatially isolated.
- Construction can resume when the CPM receives notification of the discovery and the accompanying information required in item No. 3.
- A copy of the completed DPR 523A Form is submitted to the CPM within the time period specified in CUL-7.
- All isolates will be listed and described in the CRR.

Examples of diagnostic artifacts include the following:

- Prehistoric:
  - Ceramics—decorated, rim, or basal sherds; lugs; figurines; ear spools; complete vessels
  - Lithics—points, scrapers, drills, ground stone, and blanks; exotic (imported) raw material; worked bone
- Historic:
  - Ceramics—decorated, rim, or basal sherds; maker's marks; complete vessels
  - Glass—cut, pressed, or decorated; vessel bases and lips; labels; complete vessels
  - Buttons, marbles, pipes, figurines, doll parts
  - Identifiable metal—coins, tools, gun parts, machine parts, hinges, nails, buckles, flatware, wagon hardware, horse tack
  - Identifiable plastic or rubber and worked bone

6.7.4 Treatment of Archaeological Resources Not Eligible for Prescribed Treatment and Not Human Remains

Whether treated categorically, individually, or as special isolated finds, DPR 523 forms must be completed for all cultural resources more than 50 years old or of exceptional significance, if younger, when discovered during construction. **All completed DPR 523 forms shall be provided to the CPM within the time period specified in CUL-7. Copies of all completed DPR 523 forms are also to be submitted to the CHRIS and will be included as an appendix to the final CRR.**

Except for the materials listed in Sections 6.8.1, 6.8.2, 6.8.3, and 6.8.5, all other discovered archaeological resources 50 years old or older, or resources of exceptional significance if younger, must be treated individually as significant or potentially significant discoveries. Individual treatment consists of the following steps:

1. The CRS or CRM halts construction near the find. If there is no CRS or CRM on site, the workmen stop work in the area and notify the CRS and the site foreman or construction manager. Excavation work or any other earth-moving activities within 100 feet or more will be halted or redirected, if deemed necessary by the CRS to protect the resource.

2. If the CRS is not on site, the CRM notifies the CRS and the site foreman or construction manager of the find.

3. If the CRS determines that the discovery qualifies for prescribed treatment, then the CRS or CRM, under direction of the CRS, follows the procedures outlined in Section 6.8.2.

4. If the discovery does not qualify for prescribed treatment, then the CRS or the project owner notifies the CPM of the find within 24 hours, according to CUL-7.

5. The CRS provides the owner and the CPM with a recommendation on the eligibility of the find for the CRHR. The project owner, the CRS, and the CPM confer, and the CPM determines whether the find is eligible.

6. If the find is not eligible for the CRHR, the CRS or CPM completes a DPR 523 primary form, and the project owner submits the completed form to the CPM within the time period specified in CUL-7. After reviewing and approving the form, the CPM approves the resumption of construction in the area of the find.

7. If the find is eligible, the CRS submits an avoidance plan or an appropriate data recovery plan to the CPM. If the CRS or a specialist in human osteology determines that the find includes human remains, those remains are to be treated under the protocol for treatment of human remains (see Section 6.8.5). If feasible, as determined by the CPM, the CRS will continue to treat the portion of the find not subject to HSC 7050.5 and PRC 5097.98 under this section (6.8.4).

8. The CPM approves the data recovery plan, and data recovery is carried out. The previously prepared research design, in the CRMMP or the data recovery plan provides a guide regarding what artifacts are collected and curated. Excavations where cultural material has been discovered will not be back-filled until the CPM approves the back-filling. If the area needs to be secured, the project owner arranges for plating, fencing, or other temporary measures approved by the CPM.

9. When data recovery is completed, the CRS completes the appropriate DPR 523 detail form, and the project owner provides it to the CPM within the time period specified in CUL-7.

10. After reviewing and approving the form, the CPM approves backfilling the data recovery excavations and the resumption of construction in the area of the find.

6.7.5 Treatment of Human Remains

If the CRS or a specialist in human osteology determines that a discovery includes human remains, the following will be done:

1. All excavation activities within 100 feet of the remains will immediately stop, and the area will be protected with flagging or by posting a monitor or construction worker to ensure that no additional disturbance occurs. If the discovery occurs at the end of the work day, the area must be secured by posting a guard, covering with heavy metal plates (if the human remains are found below grade), covering with other impervious material, or making other provisions to prevent damage to the remains.

2. The project owner or authorized representative (usually the CRS) will contact the county coroner (Contra Costa County Coroner, (925) 335-1510).

3. The CRS will notify the CPM and, as a courtesy, will notify the NAHC.

4. The coroner will have 2 working days to examine the remains after being notified in accordance with HSC 7050.5. If the coroner determines that the remains are Native American and are not subject to the coroner's authority, the coroner has 24 hours to notify the NAHC of the discovery.

5. The NAHC will immediately notify the MLD, who will have 48 hours after being granted access to the location of the remains to inspect them and make recommendations for treatment. Work will be suspended in the area of the find until the CPM approves the proposed treatment of the human remains.

6. If the coroner determines that the human remains are neither subject to the coroner's authority nor are Native American in origin, then the CRS will again contact the CPM in accordance with CUL-7 to determine mitigation measures appropriate to the discovery (see Section 6.8.2).

6.8 Expansive Exposure of Discovered Resources Is Possible

Broad areas are usually accessible for archaeological investigations at the plant site. In some cases, broad excavations are possible within a linear ROW when the ROW is through open land. When discoveries possibly over 50 years of age are made in areas where investigations can be conducted over broad areas, the following will be completed:

1. The horizontal and vertical boundaries of the deposit will be defined.

2. The stratigraphic relationships and depth of the deposit will be defined.

3. The content of the deposit (i.e., the date range and information potential) will be investigated by means of subsurface testing.
4. Sufficient information will be gathered to make a recommendation of eligibility using the research design (refining research design, if necessary).
5. The deposit will be recorded on a DPR 523 form, including a location map, a scaled drawing, and a photograph of the resource.
6. On the DPR 523 form, an eligibility recommendation will be made for the resource.
7. If the find cannot be recommended as clearly eligible or ineligible for the CRHR, the deposit will be assumed to be eligible. As a result, a CPM-approved data recovery program will be developed, based on the CRMMP research design or a refined version of the CPM-approved research design that reflects the information identified by the subsurface testing. If the CPM determines that the find is eligible for the CRHR, then all mitigation required by the CPM will be completed prior to continuing construction in the area of the discovery.

6.9 Expansive Exposure of Discovered Resources Is Not Possible

When discoveries possibly more than 50 years old are made in trenches within public roadways or in areas where access is restricted, the possibility of completing a thorough evaluation of a discovery may be limited. Safety considerations may constrain excavation or testing of a cultural resource. Access to resources discovered at depth in a trench should not automatically be considered restricted. If a question occurs about whether access is restricted, the CRS, project owner, and CPM will consult, and the CPM will determine whether the access is restricted as part of the requirements of CUL-7. In cases where exposure of the resource is limited, evaluation of a portion of a deposit for the CRHR may not be sufficient to allow an eligibility recommendation for the entire resource. When expansive exposure is possible, the following information will be gathered:

1. The horizontal and vertical boundaries of the deposit or resource will be defined to the extent possible.
2. The stratigraphic relationships and depth of the deposit will be identified by using subsurface testing. The content of the deposit (the date range and information potential) will be investigated. Where access is limited, the content and date of the deposit (if possible) will be described, and the information potential will be evaluated using the research design.
3. The site will be recorded on a DPR 523 form, including a location map, a scaled drawing, and a photograph of the resource.
4. If horizontal excavation is extremely limited and the find cannot clearly be recommended as eligible or ineligible for the CRHR, the deposit will be assumed eligible. The deposit will be treated by preparing a DPR 523 primary form to provide a record of the find, including a location map, a scaled drawing, and a photograph of the

resource. Treatment will also include developing a limited data recovery program approved by the CPM based on the research design in the CRMMP or a refined version of the research design approved by the CPM. All mitigation required by the CPM will be completed prior to continuing construction in the area of the discovery.

Construction-related excavations near the find will remain halted until all suspected cultural finds have been properly evaluated and required mitigation is completed. All ambiguous materials, including suspected yet unfamiliar or not readily identifiable cultural materials, will be considered significant by the crew and foreman, until the CRS or CRM can observe the finds and the CRS can make a significance recommendation to the CPM. If significant cultural resources are present and cannot be avoided, then impacts will be mitigated through data recovery or other means consistent with CUL-7.

6.10 Reporting Procedures for Monitoring and Non-compliance

Daily monitoring logs (Appendix D), weekly summaries of daily logs, daily emails, and interim monthly status reports will be submitted as required by CUL-6. During the monitoring period, each CRM will complete a daily monitoring log for each day that monitoring is conducted. The logs will track the cultural resources monitoring program, detail any cultural resources discovered during construction, and describe any actions taken, including identification, sampling, analysis, and preparation for curation of the significant finds. The daily logs will also include location, type of construction, the project component being worked on, and soil and weather conditions.

The CRS will provide the monitoring logs to the CPM, if requested by the CPM. The CRS will summarize the log (or logs) in a weekly status report on cultural resources-related activities on the construction site. The CRS will file the weekly reports with the project owner, who will include them in the MCR sent to the CPM. Any site location information forwarded to the CPM will be sent under confidential cover with a formal request for confidentiality pursuant to CEC Regulations. If no cultural resources activity occurred during the week, the CRS will note the reasons for not monitoring in the weekly summary report. Each day that no discoveries are made, under CUL-6 the CRS will provide a statement that "no cultural resources were discovered" to the CPM as an email or in some other form acceptable to the CPM.

The CRS may make changes in the level of monitoring and in the frequency of daily reporting by submitting a request and detailed justification for the changes to the CPM and receiving CPM approval for the changes, per CUL-6. The CRS may informally discuss the mitigation and monitoring program with the CEC staff.

If the CRS, a CRM, or other cultural resources personnel observe non-compliance with established cultural resources procedures, the CRM will prepare a Non-Compliance and Resolution Report for distribution to the CPM and project owner within 24 hours.

6.11 Data Recovery, Recordation, and Curation

The cultural resources team will have the full complement of equipment and supplies necessary for archaeological data recovery, including site mapping, photography of artifacts

and features, and recovery of artifacts and samples, for resources encountered during earth-disturbing activities. Pursuant to COC CUL-3 and-6, any cultural resources more than 50 years old or exceptional, if younger, encountered during the construction monitoring will be recorded on the appropriate DPR 523 forms and will be mapped. Recovered artifacts and samples will be analyzed in accordance with the research design and will be prepared for eventual curation at the Sonoma State University David A. Fredrickson Archaeological Collections Facility (707-664-2381).

6.12 Technical Reporting

The final CRR will report on all archaeological fieldwork—surveys, monitoring, and data recovery—conducted during project construction. Ninety days after completing ground disturbance (including landscaping), the project owner will provide to the CPM a technical report—the CRR—that describes all project monitoring, data recovery (if required), and data analyses, in accordance with the requirements of CUL-4. The CRR will follow the recommendations in the California State Office of Historic Preservation's Archaeological Resource Management Report (ARMR): Recommended Contents and Format (1990). The contents and format of the CRR for the project will be as follows.

The designated CRS will be the primary author and will direct the preparation of a final CRR according to the ARMR guidelines. The CRR will present findings for newly discovered cultural resources, or archaeological test excavation or data recovery programs that take place. The CRR will also document all field activities, such as the procedures used to determine that no cultural resources were present, or the procedures for avoidance of archaeological sites newly discovered during project construction, or new surveys for borrow sites and dates, times, locations, results, samplings, and analyses.

The report will present a detailed research design, test investigation or data recovery excavation methods, the methods used, scientific results and archaeological research questions addressed, site significance, and any additional recommendations. The report will include an evaluation of cultural resources for the project area, whether the findings are positive or negative. The report will also contain a discussion of the results of specialized analyses (radiocarbon, faunal, floral, obsidian hydration, and sourcing). It will contain completed primary and archaeological site records (DPR 523 form) for newly recorded and previously recorded sites within the project area, maps and photos of the site, drawings and photos of excavation units, and drawings and photos of selected artifacts.

If ARMR reports, survey reports, DPR 523 forms, or additional research reports have been sent to the CHRIS, then receipt letters from the CHRIS will be included as an appendix to the CRR. If the ARMR reports, survey reports, DPR 523 forms, or additional research reports have not been previously submitted to the CHRIS, then the reports will be attached as an appendix to the CRR. The project owner will submit the CRR to the CEC CPM. Within 90 days of CEC CPM approval of the report, the final report will be distributed to the North Coast Information Center of the CHRIS system, the SHPO, and the CPM.

If additional cultural resources monitoring and data recovery are conducted during the operation and maintenance of the project, a CRR addendum will be provided to the CPM 90 days after completing ground disturbance in accordance with CUL-4.

SECTION 7

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Appendix A
Cultural Resources Conditions of Certification

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of construction-related ground disturbance (includes "preconstruction site mobilization," "ground disturbance," and "construction grading, boring and trenching," as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRSs (at the project owner's option). The project owner shall submit the resumes and qualifications for the CRS, CRS alternates, and all technical specialists to the CPM for review and approval.

The CRS shall manage all monitoring, mitigation, curation, and reporting activities required in accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No construction-related ground disturbance shall occur prior to Compliance Project Manager (CPM) approval of the CRS and alternates, unless such activities are specifically approved by the CPM.

Approval of a CRS may be denied or revoked for reasons including but not limited to non-compliance on this or other Energy Commission projects. After all ground disturbance is completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, if the CPM approves. With the discharge of the CRS, these cultural resources conditions no longer apply to the activities of this power plant.

CULTURAL RESOURCES SPECIALIST

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61 (36 C.F.R., part 61). In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field;

2. At least three years of archaeological or historical, as appropriate (per nature of predominant cultural resources on the project site), resource mitigation and field experience in California; and

3. At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

1. a B.S. or B.A. degree in anthropology, archaeology, historical archaeology or a related field and one year experience monitoring in California; or

2. an A.S. or A.A. degree in anthropology, archaeology, historical archaeology or a related field, and four years experience monitoring in California; or

3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology or a related field, and two years of monitoring experience in California.

CULTURAL RESOURCES TECHNICAL SPECIALISTS

The resume(s) of any additional technical specialist(s), e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification:

1. At least 45 days prior to the start of construction-related ground disturbance, the project owner shall submit the resume for the CRS, and alternate CRS(s) if desired, to the CPM for review and approval.

2. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS, if different from the alternate CRS, to the CPM for review and approval. At the same time, the project owner shall also provide the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project to the proposed new CRS. If there is no alternate CRS in place to conduct the duties of the CRS, a previously approved CRM may temporarily serve in place of a CRS for a maximum of 3 days. If cultural resources are discovered during the time, then construction-related ground disturbance shall halt and remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

3. At least 20 days prior to construction-related ground disturbance, the CRS shall provide a letter to the CPM naming CRMs for the project and attesting that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition.

4. At least 5 days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to their qualifications.

5. At least 10 days prior to any technical specialists beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval.

6. At least 10 days prior to the start of construction-related ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions.

CUL-2 Prior to the start of construction-related ground disturbance, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, confidential cultural resources reports, all supplements, the Energy Commission's Final Staff Assessment (FSA), and the Final Decision, including all Conditions of Certification, for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No construction-related ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until construction-related ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where construction-related ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification:

1. At least 40 days prior to the start of construction-related ground disturbance, the project owner shall provide the AFC, data responses, confidential cultural resources documents, and the Energy Commission FSA to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

2. At least 15 days prior to the start of construction-related ground disturbance, if there are changes to any construction-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

4. Weekly, during construction-related ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

5. Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-3 Prior to the start of construction-related ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No construction-related ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

2. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. A mitigation plan shall be prepared for any CRHR-eligible (as determined by the CPM) resource, impacts to which cannot be avoided. A prescriptive treatment plan may be included in the CRMMP for limited data types.

3. Specification of the implementation sequence and the estimated time frames needed to accomplish all construction-related tasks during the construction-related ground disturbance and post-construction-related ground–disturbance analysis phases of the project.

4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

5. A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

6. A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction-related ground disturbance, construction, and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of construction-related ground disturbance and how long they would be needed to protect the resources from construction-related effects.

7. A statement that all encountered cultural resources over 50 years old shall be recorded on Department of Parks and Recreation (DPR) 523 forms and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

9. A statement demonstrating when and how the project owner will comply with Health and Human Safety Code 7050.5(b) and Public Resources Code 5097.98(b) and (e).

10. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during construction-related ground disturbance and cannot be treated prescriptively.

11. A description of the contents and format of the final Cultural Resource Report (CRR), which shall be prepared according to ARMR guidelines.

Verification:

1. Upon approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CRMMP for the CRS.

2. At least 30 days prior to the start of construction-related ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

3. At least 30 days prior to the start of construction-related ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 The project owner shall submit the final Cultural Resources Report (CRR) to the CPM for approval. The final CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, DPR forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRR.

If the project owner requests a suspension of construction-related ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until construction-related ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

2. Within 90 days after completion of construction-related ground disturbance (including landscaping), the project owner shall submit the final CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

3. Within 90 days after completion of construction-related ground disturbance (including landscaping), if cultural materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, to accept cultural materials, if any, from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

4. Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Tribal Chairpersons of any Native American groups requesting copies of construction-related reports.

CUL-5 Prior to and for the duration of construction-related ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the cultural resources team, and may be presented in the form of a video. During the training and during construction, the CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when construction-related ground disturbance is completed or suspended, but must be resumed when construction-related ground disturbance, such as landscaping, resumes. The training shall include:

1. A discussion of applicable laws and penalties under the law;

2. Samples or visuals of artifacts that might be found in the project vicinity;

3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;

4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;

5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt construction-related ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;

6. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

7. An informational brochure that identifies reporting procedures in the event of a discovery;

8. An acknowledgement form signed by each worker indicating that they have received the training; and

9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No construction-related ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of construction-related ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.

2. At least 15 days prior to the beginning of construction-related ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

3. Monthly, until construction-related ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time all construction-related ground disturbance at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of the earth-removing activities in the areas specified in the previous paragraph, for as long as the activities are ongoing. Where excavation equipment is actively removing dirt and hauling the excavated material farther than fifty feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no further than fifty

feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

A Native American monitor shall be obtained to monitor construction-related ground disturbance in areas where Native American artifacts are discovered, and written notification of discoveries of archaeological material of interest to Native Americans shall be sent to those Native Americans who requested to be notified of such discoveries. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow construction-related ground disturbance to proceed without a Native American monitor.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend

corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification:

1. At least 30 days prior to the start of construction-related ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.

2. Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.

3. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

4. Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form of communication acceptable to the CPM.

5. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

6. No less than two days after the letter is sent, the CPM shall be copied on all of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information following the discovery of any Native American cultural materials. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

7. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

CUL-7 The project owner shall grant authority to halt construction-related ground disturbance to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of construction-related ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CPM), or impacts to such

a resource can be anticipated, construction-related ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. If the discovery includes human remains, the project owner shall comply with the requirements of Health and Human Safety Code 7050.5(b) and (c). Monitoring and daily reporting as provided in these conditions shall continue during the project's construction-related ground-disturbing activities elsewhere. The halting or redirection of construction-related ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.

2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.

4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Verification:

1. At least 30 days prior to the start of construction-related ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt construction-related ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

2. Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during construction-related ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

CULTURAL RESOURCES ACRONYM GLOSSARY

OAKLEY GENERATING STATION

AD	After the Birth of Christ
AFC	Application for Certification
ARMR	Archaeological Resource Management Report
BC	Before the Birth of Christ
CCIC	Central California Information Center (CHRIS), California State University, Stanislaus
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
Conditions	Conditions of Certification
CPM	Energy Commission Compliance Manager
CRHR	California Register of Historical Resources
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
DPR 523	Department of Parks and Recreation cultural resource inventory form
FSA	Final Staff Assessment
LORS	Laws, Ordinances, Regulations, and Standards
MCR	Monthly Compliance Report

Appendix B
WEAP Sign-off Record

Certification of Completion of Cultural Resources Education Program

Oakley Generating Station Project, Contra Costa County, California

Cultural Resources Education Program Verification

All On-Site Employees

This is to certify the below-mentioned individuals have completed a mandatory California Energy Commission-approved Cultural Resources Education (Environmental Awareness) Program for Employees on site at the Oakley Generating Station Project. By signing below, the participants indicate that they understand and shall abide by the guidelines set forth in the Program materials.

No.	Employee Name	Company	Signature	Date
1.				
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Trainer: _____ Signature:_____ Date: _____/_____/_____

Appendix C
Resumes for Cultural Resources Team

Designated Cultural Resources Specialist:
Clint Helton

Cultural Resources Monitors:
Phil Reid, Henry Davis, and Daniel Ewers

Clint Helton, RPA

Senior Cultural Resources Specialist

Education

M.A., Anthropology

B.A., Language and Literature

Professional Registration

Registered Professional Archaeologist (1999, No. 11280)

Distinguishing Qualifications

- Strong background in environmental impact evaluations, with particular expertise in conducting cultural resources studies in California, Colorado, Idaho, Nevada, Utah, and Wyoming
- Has 13 years of environmental management experience in the western U.S.
- Meets Secretary of Interior Professional Qualification Standards (36 CFR 61)
- Highly experienced managing cultural resources studies for large linear transportation and utility projects to meet requirements of National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), California Environmental Quality Act (CEQA), and standards of the California Energy Commission (CEC), and Federal Energy Regulatory Commission (FERC)

Relevant Experience

Mr. Helton is an environmental consultant with more than 13 years of environmental management experience in the western United States. He has a strong background in environmental impact evaluations, having directed technical studies; negotiated with lead agencies, responsible agencies, and clients; and written, edited, and produced a substantial number of environmental review and technical documents. Mr. Helton has extensive experience of regulatory compliance, cultural and paleontological resources, NEPA and NHPA compliance activities, and federal regulations governing treatment of cultural resources, especially Section 106 of NHPA (36CFR800) and the Native American Graves Protection and Repatriation Act (NAGPRA) (43CFR10). Additionally, Mr. Helton is experienced with the challenges of preparing environmental documentation for large linear utility projects, including large interstate pipelines and is familiar with the process and guidelines of CEC and FERC among others. Mr. Helton has authored numerous environmental technical reports, cultural resources management plans, cultural resources studies, Programmatic Agreements, and Memorandums of Understanding (MOU) and contributed to many NEPA and CEQA documents for a variety of private and public sector clients.

Representative Projects

Mariposa Energy Project, Alameda County, California. Task Lead and overall management of cultural resources studies for the construction of a simple-cycle generating facility with a nominal capacity of 200-megawatts. Responsible for preparation of cultural resources

component of project, including field surveys, report preparation, and conducting Native American consultation.

Turlock Irrigation District Almond 2 Power Plant, Ceres, California. Task Lead and overall management of cultural resources studies for the construction of a simple-cycle peaking facility rated at a gross generating capacity of 174 megawatts. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

Carlsbad Energy Center Project, Carlsbad, California. Task Lead and overall management of cultural resources studies for the construction of a combined-cycle facility consisting of two natural-gas-fired turbines, heat recovery steam generators, steam turbine generators, and associated equipment. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

GWF Energy Tracy Combined Cycle Conversion Project, San Joaquin County, California. Task Lead and overall management of cultural resources studies for this conversion of an existing peaking plant to a combined-cycle baseload facility in San Joaquin County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

BrightSource Energy, Ivanpah Solar Electric Generating System Project, San Bernardino County, California. Assisted with preparation of Application For Certification for California Energy Commission in support of a large proposed solar power generation facility covering over 4,000 acres of land managed by Bureau of Land Management in San Bernardino County, California. Responsible for preparation of cultural resources component of project, including archival research, field surveys, report preparation, and conducting Native American consultation.

Terra-Gen LLC Alta Wind Project, Kern County, California. Task Lead, quality control manager, and overall management of cultural resources studies for this 5,000-acre-plus alternative energy development project near the City of Tehachapi, Kern County, California. Provide regulatory guidance, regional technical expertise in cultural resources and coordination with Kern County. Supervised inventory for cultural resources, technical report preparation, and conducted Native American Consultation.

Iberdrola Renewables, Multiple Solar Energy Development Projects, Arizona, California, New Mexico, Nevada. Led preparation of cultural resources assessments for solar power generation facilities in Arizona, New Mexico, Nevada, and California. Mr. Helton is acting as principal investigator for several critical issues analyses as well as full permit preparation of solar energy development projects in Arizona, California, Nevada, and New Mexico. Project acreages range from 5,800 acres to 35,000 acres.

PPM Energy, Solar Energy Development, Arizona, Nevada, California. Cultural resources assessments for solar power generation facilities in Arizona, Nevada, and California. Mr. Helton is acting as principal investigator for literature searches and field visits for several proposed solar energy projects in Arizona, California, and Nevada. Project acreages range from 2,000 acres to 25,000 acres.

Edison Mission Energy, Walnut Creek Energy Park Power Plant, California. Assisted with preparation of Application for Certification for California Energy Commission in support of this proposed 500-MW power generation facility in Los Angeles County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

Edison Mission Energy, Sun Valley Energy Center Power Plant, California. Assisted with preparation of Application for Certification for California Energy Commission in support of this proposed 500-MW power generation facility in San Bernardino County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

Chula Vista Energy Upgrade Project, MMC Energy, San Diego County, California. Task Lead and overall management of cultural resources studies for this 100-MW power plant upgrade project in San Diego County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

Names and telephone numbers of contacts familiar with the work of the CRS on referenced projects:

Beverly Bastian
California Energy Commission
Biological/Cultural Resources Unit
(916) 654-4840

Dena Parish
Humboldt Bay Generating Station
Office (707) 444-6568
Cell (707) 267-8674

PHILLIP GRANT REID M.A.
Archaeologist and Osteologist
Home 925-370-2709
Cell 510-673-0909

EDUCATION

San Francisco State University, M.A., Anthropology, 2010

San Francisco State University, B.A., Anthropology, 2001

TRAINING

HAZWOPER Hazardous Waste Operations and Emergency Response Training (40-hour class)

OSHA 10 hour construction Safety Training

PROFESSIONAL EXPERIENCE

Mr. Reid is an archaeologist with over ten years experience in cultural resource management with a specialization in human osteology and the archaeology of the built environment. Mr. Reid has served as a field director, a construction monitor, and participated in numerous surveys, the recording of historic and prehistoric archaeological sites, as well as archaeological data collection and analysis. Mr. Reid has successfully interfaced between clients and Native American representatives in order to find solutions to complex cultural resource issues, developed and implemented cultural resource management plans, and has contributed to numerous reports for NHPA Section 106, NAGPRA and CEQA compliance.

CURRENT POSITION

2006 - Present	Staff Archaeologist and Osteologist Garcia and Associates (GANDA)	San Anselmo, CA

SELECTED EXPERIENCE

PG&E Colusa Generating Station, Maxwell California **2008-2010**

Cultural Resources Monitor (CRM) and report author. Monitored excavations in areas of intact native soils with the potential for cultural deposits, including construction within the CGS project site and associated off-site transmission, and natural gas lines as well as the Teresa Creek bridge replacement. Cultural resource finds to the California Energy Commission (CEC), who was the lead agency for the project.

Port Petrol Marine Terminal Facility at Vandenberg AFB, **2009**
Santa Barbara County, CA.

Completed field survey, mapping of existing historic resources and contributed to a Cultural Resources Condition Assessment for the Port Petrol Marine Terminal Facility at Vandenberg AFB as part of Vandenberg AFB Section 106 compliance program.

PG&E Gateway Generating Station, Antioch California 2007-2009

Cultural Resources Monitor (CRM) and report author. Monitored excavations in areas of intact native soils with the potential for cultural deposits, including construction within the GGS project site as well as associated off-site transmission, natural gas and sewer lines. Cultural resource finds to the California Energy Commission (CEC), who was the lead agency for the project.

PG&E Kilarc-Cow Hydroelectric decommissioning project, 2008
Shasta County, California

Survey, site recording, and report preparation to comply with Section 106 and FERC regulations for the decommissioning of the Kilarc-Cow Creek Hydroelectric facility in Shasta County, California.

Archaeological monitoring and testing for the Owens Lake 2008-2010
Dust Control Project, Inyo County, California.

Field director, monitor, and report author. Tasks included an update of the records search, Native American consultation, onsite field monitoring and archaeological site testing and evaluation for new cultural resources discovered during monitoring to comply with CEQA and Section 106 regulations.

SELECTED AUTHORED AND CO-AUTHORED REPORTS

Owens Lake Dust Mitigation, Phase 7Cultural Resources Monitoring and Mitigation Report 2008-2010. Prepared for the Los Angeles Department of Water and Power Prepared for the Los Angeles Department of Water and Power Environmental Services, 111 North Hope Street, Room 1044 Los Angeles, California 90012. May 2010.

Report on Cultural Resources for the LADWP 1600 AF Project, Inyo County, California. Prepared for the Los Angeles Department of Water and Power Environmental Services, 111 North Hope Street, Room 1044 Los Angeles, California 90012. December 2009.

Final Monitoring Report Years 2008 and 2009 PG&E Colusa Generation Station, Colusa, CA. November, 2009

Archaeological Evaluation and Testing OL-2009-2 for Phase 7 of the Owens Lake Dust Mitigation Program, Inyo County, California. Prepared for KDG. July, 2009

Cultural Resources Survey Report for the Port Petrol Marine Terminal Facility at Vandenberg AFB, Santa Barbara County, CA. April 2009.

Cultural Resource Management Plan (CRMMP) for the PG&E Colusa Generating Station in Maxwell, Colusa County, California. Prepared for CH2MHill. February, 2008

Final Monitoring Report Years 2007 and 2008 PG&E Gateway Generation Station, Antioch, CA. February 2009.

Fort Bragg IARAP - ARCADIS Archaeological Monitoring Report- Field Year 2008 For The Georgia-Pacific Corporation Wood Products Manufacturing Facility Closure Project Fort Bragg, Mendocino County, California Prepared For: Arcadis140 2nd Street, Suite 200, Petaluma, California 94952. February 2009.

Cultural Resources Inventory and Evaluation for the Kilarc-Cow Creek Hydroelectric Decommissioning Project, FERC No. 606, Shasta County, California. Submitted to CH2MHill and PG&E, May 2008.

Balch Camp – Oak Flat Water and Sewer Line Replacement Project, Fresno County, CA. December 2007.

Letter Report RE: Cultural Resource Constraints Analysis for the Proposed Area 6 SCADA Project: Colgate #27. Report prepared for PG and E. May, 2007.

Letter Report RE: Cultural Resource Constraints Analysis for the Proposed Area 6 SCADA Project: Smartville #17, #19, #27, and #29. Report prepared for PG and E. May, 2007.

Letter Report RE: Cultural Resource Constraints Analysis for the Proposed Area 6 SCADA Project: Elizabethtown # 61 and #71. Report prepared for PG and E. May, 2007.

Letter Report RE: Cultural Resource Constraints Analysis for the Proposed Area 6 SCADA Project: Summit. Report prepared for PG and E. May, 2007.

OTHER RELEVANT EXPERIENCE

Archaeological Technician 2005-2006
Holman and Associates , San Francisco CA
Completed surveys and excavations for Phase I through III for various projects in California. Monitoring and excavating human remains for various projects in California. Test excavations at the Levi-Strauss building in San Francisco in preparation for earthquake retrofitting.

Field Archaeologist, Crew Chief 2006
Pacific Legacy Inc., Cameron Park CA
Crew Chief, duties included directing monitoring, burial excavation, interfacing with Native American representatives and construction managers at CA-CCO-1 in Bethel Island, California.

Research Assistant 2004-2007
Mission Dolores Museum San Francisco, CA
Assisted curator with research and creating new exhibits at Mission Dolores, San Francisco, California.

Research Assistant 2002-2005
NAGPRA Program, San Francisco State University, San Francisco CA
Cataloging of materials, collection management, and student instruction for a variety of projects, including the catalog of the Buchanan Reservoir for the Army Corps of Engineers.

Archaeological Technician/Consultant 2001-2004
Basin Research Associates, San Leandro CA
Completed excavations at the Asian Art Museum of San Francisco (CA-SFR-126/H) during which a mid to late 19th century cemetery was excavated, including human burials and associated artifacts during seismic retrofit. Also monitored construction activities at the San Jose City Hall project in San Jose California; duties included recording and excavating several privy columns including various types of historic artifacts.

Field Archaeologist 2002
URS Corp., Chico CA
UIFR Survey in Ely, Nevada for the Bureau of Land Management. Recorded several late 19th and early 20th century mining camps and homesteads in addition to prehistoric sites. Artifact types include household, toys, food preparation and storage and were analyzed on site.

Field Archaeologist 2002
TRC Corp., Albuquerque NM
Participated in survey and recording archaeological sites and isolates for the Bureau of Land Management and the Fort Irwin Archaeological Survey.

Monitor/Lecturer 1999-2005
Ohlone Indian Tribe, Fremont CA
Frequently employed as a monitor for various construction projects in the San Francisco Bay Area and lecturer for school children from 3rd grade to college level students.

Staff Archaeologist 1998-2004
Archaeor, Fremont CA
Completed surveys and excavations for Phase I through III for various projects in California, including CA-ALA-1/H in Fremont. Excavated and analyzed artifacts from a mission period dormitory foundation. Artifact types include luxury and religious items, tools, food preparation and storage. Also monitored the renovations of an early 20th century cannery and late 18th century winery at Plant 51 in San Jose.

ADDITIONAL EXPERIENCE
1997-1999 Archaeological Field School, Ohlone College at Mission San Jose in Fremont, CA.
Supervisor: George Rogers

MEMBERSHIPS
2005-2009 Member of the Mission Dolores Scholars Group, Mission Dolores, San Francisco, CA

PRESENTATIONS
Society for California Archaeology, Northern CA Data Sharing Meeting, October 22nd 2005, San Francisco State University. Topic: The Archaeology of CA-ALA-343.

REFERENCES

Christopher Canzonieri, M.A. Physical Anthropologist & Archaeologist
Basin Research Associates
1933 Davis Street, Suite 210
San Leandro, CA 94577
510.430.8441 ext. 207
510.220.1822 field cell

Andrew Galvan, Tribal Consultant and Curator at Mission Dolores, San Francisco, CA.
PO Box 3152
Mission San Jose, CA 94539
510.882.0527 Cell
510.656.0787 Office

Richard Thompson, Archaeologist
Archaeor
PO Box 3388
Fremont, CA 94539
510.882.3507
510.687.9292

Carole Denardo, Project Manager, Archaeologist and Architectural Historian
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960
805.350.3134 Cell
415.458.5803

Christine Marshall M.S. Physical Anthropologist & Archaeologist
Basin Research Associates
1933 Davis Street, Suite 210
San Leandro, CA 94577
510.430.8441 ext. 207
925.200.5422

DANIEL G. EWERS

EXPERTISE

Archaeological Excavation, , Site Evaluation, Survey
Archaeological Assessment
Archaeological Construction Compliance Monitoring
GPS, Photography
Native American Consultation
Paleontological Assessment
Paleontological Monitoring
Paleontological Field Preparation
Technical Report Writing

EDUCATION

California State University, Fullerton, MA, Department of Anthropology (Archaeology) 2008
California State University, Fullerton, BA, Department of Anthropology (Archaeology) 2003.

THESIS

PECKED AND SCRAPED: ROCK ART AND ETHNIC/CULTURAL IDENTIFICATION OF PIUTE SPRING AND THE SURROUNDING AREA

ACCREDITATIONS

Register of Professional Archaeologists (RPA)

MEMBERSHIPS

American Rock Art Research Association (ARARA)
Lambda Alpha Honor Society—Lifetime membership
Pacific Coast Archaeological Society
Society for California Archaeology

PROFESSIONAL CERTIFICATIONS AND TRAINING

Basic First Aid--current

Adult-Child-Infant 2 Rescuer Cardiopulmonary Resuscitation--current

OSHA 40-Hour HAZWOPER [29 CFR 1910.120(e)(q)] --current

24-Hour First Responder Training [Cal OSHA 8 CCR 5192(e)(q)] --current

Riverside County Cultural Sensitivity Training Program (2009).

Storm Water Pollution Prevention Program, Building Industry Association of Southern California. 2002

PROFESSIONAL EXPERIENCE

Present. Cultural Resources Specialist. CH2M HILL, Santa Ana office, California.

November 2004-June 2009. Archaeologist, LSA Associates, Inc., (LSA) Irvine, California.

2002–2004. Crew Chief at The Keith Companies, Inc. (TKC). Responsible for all phases of archaeological fieldwork including Phase I reconnaissance and intensive surveys, Phase II test evaluation, and Phase III data recovery excavation. Additional duties include writing of field methods, procedure, and archaeological and historical site records, and archaeological site mapping. Assisted with removal of paleontological specimens from locations in Orange County and also monitored Orange County construction sites for paleontological specimens.

1999-2002. The Keith Companies, Inc. (TKC). Assisted with systematic excavation of archaeological sites. Duties included excavation, labeling and transporting archaeological data, and washing unit matrices. Also responsible for boxing and labeling of washed materials and preparation for laboratory analysis. Other duties included sorting archaeological matrices for cultural materials and identification of cultural artifacts, tagging and labeling cultural materials.

PRINCIPAL PROFESSIONAL RESPONSIBILITIES

Mr. Ewers is primarily responsible for research, field surveys, monitoring, and excavating of archaeological and paleontological resources. He prepares and conducts archival record searches at State Archaeological Information Centers. He also conducts laboratory procedures including sorting, analysis, and cataloguing of both artifacts and ecofacts collected from archaeological sites. Finally, he is responsible for preparation of archaeological and paleontological reports. Mr. Ewers has mapped archaeological sites using a Trimble GPS unit with TerraSync™ software.

RELEVANT PROJECT EXPERIENCE

Ceramic analysis of western Mexico pottery from a pre-Columbian site in Canton, Jalisco, Mexico

Rock Art Study in the Mojave National Preserve, San Bernardino County, California

Ground stone study of CA-ORA-1587

Construction Compliance Monitoring

Site 3O remediation monitoring of lead impacted soils on Camp Pendleton, San Diego County, California

Cultural resource monitoring for repair of broken communication lines at sites CA-SDI-10728, SDI-102731, and SDI-812/H near the Las Flores adobe on Camp Pendleton, San Diego County, California

Southern Orange County Transportation Infrastructure Improvement Project, Geotech Boring Monitoring, Orange and San Diego Counties.

Laguna Canyon CA-ORA-1055 monitoring Laguna Beach, California

McSweeny Farms, Testing and Phase 1 Monitoring, Hemet California.

Monitored construction grading at Planning Area 8A, Irvine California.

Construction Monitoring of Planning area 22 Shady Canyon Irvine California

Cultural Resource Surveys

Rice Air Field Solar Project CH2M Hill Cultural Resources Supervisor Arron Fergusson

Tehachipi Solar Project CH2M Hill Cultural Resources Supervisor Clint Helton

EME PV/26 Grey Butte Solar Energy project CH2M Hill Cultural Resources Supervisor Clint Helton

Southern Orange County Transportation Infrastructure Improvement Project, Archaeological Phase II testing Orange County

Mid County Parkway Extended Phase 1 testing excavation. Riverside California

Mid County Parkway Phase 2 testing excavation. Riverside California

Oak Valley San Gorgonio Pass California Archaeologist brush clearing monitor for geophysical study. San Bernardino and Riverside Counties.

Mesquite Regional Landfill (MRL) Project, located in Imperial County, California. Surveying and recording of prehistoric and historic sites on 2,500 acres administered by Bureau of Land Management

Fagan Canyon Ventura County California: Archaeologist in the excavation and trenching of two prehistoric sites.

Oak Valley San Gorgonio Pass California Archaeologist for the survey portion of the project.

Mid County Parkway Survey Riverside County, California

Mid County Parkway, Riverside California: Crew Chief and field crew on the Mid County Parkway Survey.

Cultural Resource Assessment Nuevo 57 in the Community of Nuevo unincorporated Riverside County, California

Cultural Resource Assessment Perris Marketplace City of Perris, Riverside County California

Cultural Resource Assessment Pine Cove Well Survey for the Pine Cove Water District in the City of Idyllwild, California

Cultural Resource assessment Mount San Jacinto Community College District Southwest Campus-Wildomar Riverside County, California

Cultural Resource Assessment and Archaeological Testing of the Stoneridge Development Project, Moreno Valley, California (LSA Associates, Inc.).

Archaeological Assessment of the San Gorgonio Hydroelectric Decommissioning Project, San Bernardino National Forest, California (LSA Associates, Inc.).

Cultural Resource Assessment of Vista del Valle, Victorville, California (LSA Associates, Inc.).

Cultural Resource Assessment Verbena Gardens in the city of Desert Hot Springs, Riverside County, California

Field crew for nine archaeological sites in Planning Area 17 Irvine, California.

Field crew Phase I and II testing of nine archaeological sites in Planning Area 27 Irvine, California

Phase I testing of archaeological site Ca-ORA-244

Survey Planning Area 39, Irvine, California

Crew Chief Phase II testing of 15 prehistoric sites Planning area 6, Irvine, California.

Cultural Resource Survey Adams Canyon, Santa Paula California

REPORTS

Sole Author

2005 Cultural Resource Assessment Perris Marketplace City of Perris, Riverside County California

2005 Cultural Resource Assessment Pine Cove Well Survey for the Pine Cove Water District in the City of Idyllwild, California

2005 Cultural Resource assessment Mount San Jacinto Community College District Southwest Campus-Wildomar Riverside County, California

Co-Authored Reports

2008 Cultural Resources Assessment Survey for reaches IV-A and IV-B of the Santa Ana Watershed Protection Agency, Santa Ana Regional Interceptor Pipeline. San Bernardino and Riverside Counties

2008 Preliminary Recommendations of Site Eligibility and Level of Effects:
South Orange County Infrastructure Improvement Project (SOCTIIP)

2008 Archaeological Monitoring Report: Laguna Canyon Road (SR-133) Widening & Realigning Project Station 112+80 to 175+90, Orange County California

2007 Draft Archaeological Evaluation Proposal South Orange County Transportation Infrastructure Improvement Project (SOCTIPP) Orange and San Diego Counties, California

2007 Paleontological Resources Assessment for Stonefield Chino Hills 37 City of Chino Hills, San Bernardino County, California

2006 Results of Cultural Resources Monitoring for a 23-Acre Inland Empire Utility Agency Parcel, City of Chino Hills, County of San Bernardino, California.

2005 Cultural Resource Assessment Nuevo 57 in the Community of Nuevo unincorporated Riverside County, California

2004 Cultural Resource Assessment Verbena Gardens in the city of Desert Hot Springs, Riverside County, California

As Other Than Primary

2008 Supplemental Cultural Resource Assessment: Oak Valley Substation project

2007 Cultural Resources Survey of an Approximately 12,350-Acre Area outside of the Mid County Parkway Area of Potential Effects Between Corona and San Jacinto

2006 Archaeological Testing Program for the Fagan Canyon Ranch, Santa Paula, Ventura County, California.

2006 Treatment of Cultural Resources: Mesquite Regional Landfill Imperial County, California, LSA Associates, Inc.

2004 Testing and Phase 1 monitoring at Mc Sweeny Farms, Hemet California

2004 Cultural Resource Assessment Summerwind Ranch at Oak Valley, Phase 1, City of Calimesa, Riverside County, California

2004 Archaeological Testing Program Trailmark Specific Plan Assessor's Parcel Numbers 327-150-004 and 327-150-006 Riverside County, California

PAPERS PRESENTED

Santa Catalina Island: Lay of The Land. Presented at the Annual Meeting of the Society of California Archaeology, Burbank, California April 18, 2008

ADDITIONAL INFORMATION:

- Computer Knowledge: WordPerfect, Microsoft Office.
- Technical Training: Trimble Geo XH Handheld and other models using Arc-Pad and Terrain navigator
- Proven leadership and interpersonal communication skills.
- Ability to handle high-pressure situations and deadlines with a dedication to team play.

References

Ivan Strudwick, LSA Associates 20 Executive Park, Irvine, CA 92614 949-337-6101

Clint Helton CH2M Hill 6 Hutton Centre Dr # 700, Santa Ana, CA 714-435-6140

Gloriella Cardenas 626-535-3374

Additional References available upon request

Appendix D
Daily Monitoring Log

Cultural Resources Daily Monitoring Log

_____ Project, Date: _____, Monitor Name:_____
Weather Conditions: _____
Hours on Site Not Worked and Reason: _____
Work Location (Project Component):_____
Work Type (Machine): _____
Depth of Excavation: _____
Observed Native Soils (Stratigraphy):_____

Disturbed/Redeposited Soils: _____

Features: _____

Artifacts (Isolated? Diagnostic? Older than 45 years? Exceptional? Include description, provenience, stratigraphic context.):

Recommendation of Significance of Any Finds?

Actions Taken (Halt/Resume Construction; Identification; Notifications; Recommendations; Photography; Collecting; Sampling), Other Observations:

Appendix E
Curation Agreement

SONOMA STATE UNIVERSITY
1801 East Cotati Avenue
Rohnert Park, CA 94928-3609

ANTHROPOLOGICAL STUDIES CENTER
707.664.2381 • fax 707.664.4155
www.sonoma.edu/asc

Clint Helton
CH2M HILL
6 Hutton Centre Drive, Suite 700
Santa Ana, CA 92707

April 11, 2011

RE: Archaeological curation services for CEC Project Docket 09-AFC-4

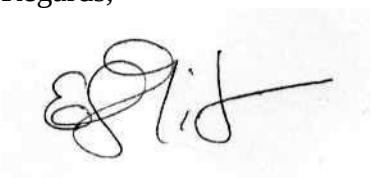
Dear Mr. Helton,

This letter confirms that the David A. Fredrickson Archaeological Collections Facility at Sonoma State University is willing to accept archaeological materials collected by CH2M HILL in the course of your work for the CEC on the Oakley Generating Station Power Plant in Oakley, Contra Costa County, California.

This offer is subject to the conditions of our standard curation agreement that include, but are not restricted to, the following: payment of a one-time in perpetuity fee, the inclusion of copies of field notes relevant to the collections, the absence of perishable objects (such as fabric or leather), and the absence of any materials subject to the Native American Graves Protection and Repatriation Act.

Please note that the Facility does not fully meet the requirements of 36 CFR 79 as it has no climate control system. The Facility does, however, have an electronic security system, a fire suppression system, and a permanent endowment that receives all fees; the Facility is overseen by a collections manager.

Regards,



Erica Gibson, M.A., RPA
Lab/Collections Manager