

IV.2 ARCHAEOLOGIC AND HISTORIC RESOURCES CULTURAL RESOURCES MANAGEMENT PLAN Technical Report

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The sound of the bulldozer is loud in the land, and from Florida to Hawaii hardly a day passes without the earth being torn and scarred by the jaws and wheels of progress. The carpet of the past is being rolled up behind us as we advance into the future, and before long when we look over our shoulders, we shall see nothing but the mirror of ourselves. Ivor Noel Hume, 1978

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PREFACE

Generally speaking, archaeology and history attempt to answer questions about human behavior within an ever-changing environment. Answering these questions can aid in a better understanding of ourselves and the world around us, as well as prepare us for our future. Archaeology provides a sense of having roots. The success of this generation or lack of it in preserving, protecting and enhancing its past, will have a direct bearing on how this nation and those who come after us perceives themselves in the decades to come. The past is worth studying as it becomes in danger of being lost, because it provides a constant reminder of our struggles and achievements; of how far we have come and have yet to go. We can use it to enlighten, or be condemned to relive it. In addition, archaeology can also contribute to public awareness and understanding and hence the appreciation of specific events in the past.

Included within the implied concept of protection, preservation and enhancement of cultural resources are such dynamics as: social interaction and change; rehabilitation and revitalization; economic growth and development; political and religious practices; scientific and technological innovations and changes; and, art and creativity. All of these elements make us uniquely "human" and are passed on from generation to generation. They mirror our human condition which is a source of potential knowledge to learn from and extract information which can aid in our present survival.

Webster's dictionary defines heritage as something transmitted by or acquired from a predecessor, a legacy. As a nation and people, Americans have an exceptional, diverse and rich heritage and legacy which is maintained through on-going private and publicly funded programs aimed at protecting the integrity of our heritage. The primary purpose of preservation is to identify, choose, and protect America's cultural resources, which are also termed archaeological resources and may be of a historic and prehistoric nature. Generally speaking, archaeological resources include places with important historical associations; where significant events of the past occurred; and those associated with persons who helped shape the history on a local or even a national level. Beyond their value as purely educational in nature, these resources are valued for their inspirational and patriotic value. Prehistoric resources provide evidence of the cultures preceding European settlement of North America and include habitation and occupation areas, production stations, seasonal encampments, and milling stations.

One of the primary approaches of this plan, is the division of heritage resources into two major categories: "prehistoric" and "historic." Included within the prehistoric cultural resources category are "Native American concerns." Even though these are arbitrary distinctions, since both concepts are part of the same continuum encompassing human behavior and experiences, the separation is both functional and practical. It allows for a vast amount of information to be collected analyzed and discussed as distinct, yet overlapping contextual units. Practically speaking, splitting this data base will facilitate planning programs, since even though the cultural resource aspects are a part of the same behavioral continuum, for the most part, they are represented by different physical types of remains.

Generally speaking, prehistoric remains tend to be below the surface with an understanding of their purpose not based primarily on written history, while historical remains tend to be on the surface, profoundly visible, and usually have a basis for understanding in written history. Although this is not always the case (as is the instance prehistorically with the presence of pictographs, intaglios, cairns, mounds, and pyramids, etc.; and historically, with the buried remains of privies, trash pits, foundations and cemeteries, etc.), more often than not, and ordinarily, the distinctions hold true.

The overlapping nature of the resource base is reflected in the thematic approach to the classifying and categorizing of resources in both the prehistoric and historic sections of the report. The categories are designed to establish the necessary historical contexts required to discover and evaluate heritage resources. These historic contexts will be best served in the implementation of "study units" for the vast area covered within the study area. In addition, an operating plan will translate the technical and evaluative criteria which are used to identify heritage resource values, into practical planning decisions, a plan which is compatible with the planning system currently used in State and Federal historic preservation plans, and by the Bureau of Land Management (BLM).

It is important that this plan allow land-use managers to have at their fingertips, a document which allows them to make more informed and timely decisions regarding preservation policies and provide more cost-effective resolutions to environmental planning problems as they pertain to heritage issues. Preservation planning, therefore, should be considered an on-going process where scientific, cultural, economic and individual concerns are continually collected and synthesized in the evaluation process. As new information is gathered, the management plan will be refined as new ways of dealing with cultural resources are proposed; shifts in heritage issues and concerns occur; public involvement ebbs and flows; funding for new projects emerge; and political agendas on every level of government change. A shift in perspective in any aspect of heritage preservation, affects the planning process resulting in on-going revisions and changes to preservation policies and procedures.

The plan is viewed as encompassing a planning process rather than a "finished product." The contextual data, criteria for evaluation, as well as other important components are at best approximations of the totality of the potential, available heritage resource base. The plan will evolve as more data accumulates and input from other sources is incorporated into the document through continual revisions. Modifications and changes are an integral part of any plan, for in preparing for changes by embracing flexibility, there emerges a goal which aims at amending flaws in an effort to achieve balance, sensibility and fairness in implementing a planning policy which benefits all concerned.

Historic Resources

Historic resources may be part of a "built environment," which includes man-made structures used for habitation, work, recreation, education and religious worship, and

may also be represented by houses, factories, office buildings, schools, churches, museums, hospitals, bridges and other structural remains that are of architectural, scientific, educational, or social value; or, that supply evidence of the past in relation to the present; or that enable the living community to understand itself contextually. Other types of historic resources may include: habitation or settlement-related features such as homesteads, farms, ranchsteads, cabins, cemeteries, wells, schools, post-offices, libraries and railroad facilities; military sites such as forts, camps and outposts and redoubts; production sites such as cattle and trail camps, line shacks, fencelines and corrals; mining resources including prospect holes, trenches, adits, placer shoals, arrastres, tents and structure flats and mill sites; water related features such as ditches, dams, canals and flumes; and communication features such as trails, roads, stage routes and utilities. Essentially more than two dozen potential historic site types have been classified into five major categories:

- exploration.
- settlement.
- military.
- mining.
- transportation.

Prehistoric Resources

Prehistoric resources represent the remains of human occupation prior to European intrusion. Based on the Bureau of Land Management (BLM) site classification system, archaeological sites are defined as a location of prehistoric activity which can be delineated specifically by the cultural remains present and can be separated by distance and/or observable geomorphic features from other loci of prehistoric activities. The cultural materials present in a site consist of artifacts and/or cultural features which are represented by objects manufactured or modified by man such as tools (projectile points, manos and metates (i.e. grinding tools made of stone), pottery, as well as other bone, stone and shell objects. Cultural features may be distinguished by clusters of artifacts and/or other material used or assembled by man that exhibit structural association and that consist of nonrecoverable or composite matrices these can include burials and cemeteries, habitation sites, lithic (i.e. rock) scatters, rockshelters, quarries, trails, pulping and mortar stations, earth ovens, bedrock mortars, rock alignments, cairns, intaglios, and pictographs. For planning purposes, at least 17 site types and 8 sub-types have been defined to encompass the wide range of prehistoric human behavior in the California desert.

Native American Concerns

Another category of resources which is included under prehistoric resources, includes ethnographic elements pertaining to Native American issues and values. It would be presumptuous for any non-Native American to draw conclusions about the special concerns which the local Native American community may feel towards a specific project. Native Americans recognize all prehistoric sites within their territory as part of their heritage. Potential disturbance and destruction of any resource can adversely affect the values of their culture and their ability to transmit these values to future generations. Therefore, any project must involve consultation with and involvement

from local and regional Native American cultural entities as listed by the Native American Heritage Commission. The local Barstow office of the Bureau of Land Management (BLM) maintains a listing of representatives of Native American groups who claim an association with the Barstow area; specifically the *Serrano*, *Kaaiisu*, *Fort Mojave*, and *Chemehuevi*.

Native Americans constitute a heterogeneous, distinct ethnic community of people who perceive themselves as holding in common a set of extremely personal views, traditions, language, beliefs and practices not shared with others. These "feelings" of a unique identity are believed to transcend European laws and processes and they are concerned with sustaining their identity and relationship with the land as well as maintaining their values. Their underlying ideology centers on the fact that they were here first and therefore are distinct from any other people. Native cultures around the world continue this thinking, their present actions geared toward persistence and revitalization of certain traditional beliefs and values. Their views are solicited in any planning process in order that they may express their concerns focusing on specific cultural resources important to them, both known and revealable, including shrines, burial sites, plants, animals, mineral resources, rock art and trails, etc.

A detailed discussion later in this report describes native American peoples who once lived within the Planning Area. The local population, probably a branch of the *Serrano*, called the *Vanyume*, was small and dwindled rapidly between 1820 and 1834; they were extinct well before 1900. No native American persons today are known to claim local descent.

CULTURAL RESOURCE MANAGEMENT

The march of Providence is so slow and our desires so impatient; the work of progress is so immense and our means of aiding it so feeble; the life of humanity is so long, that of the individual so brief, that we often see only the ebb of the advancing ways, and are thus discouraged. It is history that teaches us to hope.

Robert E. Lee in a letter to Charles Marshall circa 1866

BACKGROUND

Cultural Resource Management as directed by archaeological field and research programs, aims at answering questions about prior lifeways and analyze relationships between these early inhabitants and their environment as well as to each other. However, it is equivalent to trying to write a complete story about someone or something without having all the facts. The process of faithfully gathering all the information possible in order to provide as clear a picture as possible, is the ultimate goal. Amplify this complicated process of achieving a complete picture of the subject by the fact that a people you are studying have disappeared, without written

records, and without the level of information that we take for granted in this computer age, and the problems become inherently frustrating.

To find out who we are today, why we have become who we are, and learn from prior mistakes in order to grow morally, spiritually and ethically, we need to piece together our past and understand it. Only from the resources we call “cultural” pertaining to what we have left behind, can we accomplish this and move forward. All movement forward is propelled by an understanding of what lies behind us. Essentially, our past has always conditioned our future. If that is destroyed, or lost, then the substance of change and growth cannot be measured or appreciated. We will only stagnate in the present, repeating and reliving each moment until we find that which we have lost, our past, our heritage.

Impacts to cultural resources are identified by comparing plans for land alteration with the location of individual resources. The extent of the impact can be measured by the amount of scientific information which will be lost upon implementation of the project. Direct impacts destroy the information that is present within a cultural resource(s) through the removal of the material remains which contribute to the integrity of the site (location, design, setting, materials, workmanship, feeling, and association). Indirect impacts tend to affect a resource(s) by significantly enhancing the possibility of destruction through increased access or awareness, usually resulting in vandalism. Therefore, alleviating potentially adverse impacts to cultural resources through mitigation measures, is the basis for cultural resource management recommendations.

As we look back into the past, our visibility becomes increasingly poor, and our ability to understand events within the context of the names, faces, and ideas which gave it substance, less accurate. It is up to the individual investigator's skills to reconstruct the socio-cultural context of archaeological remains. The degree to which the process of recordation, analysis and reconstruction is accomplished, is in direct proportion to the level of understanding that is achieved. To understand who we are, we must understand who we were. By doing so, we might be able to glimpse what we might become.

GOALS

The basic goals of this management plan are aimed at providing the City of Barstow with specific information relevant to achieving compliance with the guidelines established by the California Environmental Quality Act (CEQA) and the Advisory Council on Historic Preservation (ACHP). This document will supply the background and direction, enabling the City to fulfill its legal requirements with regard to the identification, recordation, evaluation, protection, preservation and enhancement of the cultural resources located within its sphere of influence or affected by any proposed actions. Specifically, the goals of the heritage management plan are to:

Protect, preserve and enhance the full array of cultural resources within the City of Barstow's study area for the scientific and social benefit of present and future generations.

- Ensure that the cultural resource base is given full consideration in land use planning and management decisions.
- Manage the cultural resources in order that their quality and scientific and socio-cultural values are maintained and enhanced.
- Ensure that any development activities considered by the City of Barstow's planning staff within the purview of this study do not inadvertently damage the cultural resources.
- Achieve adequate and proper recovery of any cultural resources which face potential adverse project impacts which cannot be avoided in compliance with appropriate cultural resource legislative enactments.

The protection and preservation of cultural resources are often times difficult to secure because they are susceptible to unintentional damage and destruction by various activities including development, mining, off-road vehicle use, vandalism and looting. Disclosure of locational information prior to the implementation of protective measures increases the risk of irreparably damaging or destroying sensitive and irreplaceable resources. Therefore, any documents circulated to the public must be extremely selective with regard to providing locational information which may destroy a resource.

A two-phased approach will provide an overview of existing cultural resources within the City of Barstow's sphere of influence and a cultural resource management plan which is designed to draw from the results of the first phase in providing a basis for future management of the cultural resource elements within its scope. Conceptually, a plan such as this should be fairly straight forward and uncomplicated. In actuality, its formulation and implementation presents a wide range of considerations which must be addressed from regulatory, planning, scientific and public perspectives.

The intent of this plan results from a broader context which is inherently rooted in the national and state public cultural resource policies set into motion in 1908 and given authority by the National Historic Preservation Act of 1966 (80 Stat. 915) when the national preservation system was founded. Contrary to the development and implementation of national policy with regard to cultural resources, state documents pertaining to similar issues lagged far behind. Even after the California Environmental Quality Act was made law in 1970, it took almost 13 years for the State of California, through the State Office of Historic Preservation (OHP) to implement CEQA on a local level. This process is still on-going in terms of revisions to existing documents.

Essentially, preservation policy on the part of the City of Barstow should be one of partnership with Federal and State agencies which are responsible for administering the National Historic Preservation Act (NHPA) of 1966, as well as related laws, guidelines and policies. The City should be careful to follow the regulations adopted for NHPA to identify, preserve and protect historic and archaeological resources;

minimize destructive and unavoidable impacts to the cultural resource base; and work out effective strategies, policies and procedures to maintain good working relationships with other organizations and agencies to promote and facilitate development, while at the same time, protecting its valuable resources.

PRESERVATION VALUES

In considering the need for preservation and protection of cultural resources, legal, social, economic, psychological, scientific and personal reasons must be considered. Inherent in the idea of preservation and protection of cultural resources, is the concept of public welfare which embraces the spiritual, physical, monetary and esthetic values. Maybe the basic value intrinsic to public welfare lies within a very personal value system which seeks balance and harmony with all things and the desire to extract the "highest quality of life" possible during the course of a lifetime, and pass this truth on to future generations. Preservation is a manifestation of how we feel about ourselves and to what lengths we are willing to go to protect our past and in doing so, enhance our future.

The fabric of life is made up of past experiences which are translated into scenes and events which have left a physical and psychological imprint on the landscape. Unfortunately, and all too often, the physical remains which defines who we are and the struggles we have had to overcome in order to reach where we are today, are only appreciated once they are destroyed, lost, or forgotten.

The physical remains are what bind us psychologically and emotionally to each other. If we cannot save those bits and pieces of our experience and pass them on to future generations, how will they come to fully appreciate past generations, this generation; are themselves by reason of bonding to the past? And what will they be able to leave as a legacy to their children? Therefore, our heritage is not something divorced from us, or separated from our psyche and spirit, it is a part of us and who we are, something that must be embraced, preserved and transmitted.

Psychological Value

Probably the most important value which can be attributed to a need for preservation, lies within each of us, and is therefore personal in nature. This psychological appreciation of the physical remains of our past is most likely the single most important aspect which contributes toward a policy of conservation of our heritage. The personal and psychological values permeate preservation law, providing direction and support. There is a need for most people to maintain a personal or family history, including photo albums, articles, certificates, trophies and the like. They represent physical reminders of who they are and what they have accomplished. Cultural resources are like mementos and collectibles, except on a local, regional, national and world level. They bridge the gap between the past and present, serving as constant reminders that important events, people, or circumstances occurred.

Physical reminders provide a sense of roots when everything else is constantly changing around us. They help define our lives in a very personal way and give it substance and meaning. The fabric of life is made up of all the scenes and events from past experience, although they may not be appreciated until they are lost. The struggle to hold on to the physical characteristics that define our lives is therefore a very personal and emotional battle for all of us (US Department of Transportation (n.d.: 1-4).

Social Values

Socially, we seek to preserve our cultural resources because they link us to the past and are therefore the only source of information available to help us discover who we are; understand the process of how we came to be; and appreciate the similarities we share with all human beings, as well as the differences that make us unique. By preserving our heritage through the protection of the physical remains which enable us to see ourselves in our past, we will always retain a bond to our ancestors and our roots. The preservation of archaeological remains means to engender a lasting tie to past events, individuals, situations and circumstances. This honoring of ones heritage, based on nostalgia, patriotism, concern, emotion and respect, is not only unifying but fulfilling. It provides an unbroken emotional link binding generations. Finally, the concept of preservation in a societal sense, looks beyond architecture, history, sentiment, science and intellect, and seeks to conserve remaining instances of who we are in a large sense through preserving neighborhoods, districts and even entire communities for human purposes.

Economic Values

From a business standpoint, many people have found it extremely advantageous to preserve physical remains rather than destroy them. Beyond the direct savings associated with adaptive use, renovation and rehabilitation of certain structures, local and regional benefits also accrue. Instead of decay, there is rebirth through preservation. Jobs through construction are often initiated by renovation and rehabilitation of older buildings. A finished product may in turn increase real estate values, promote tourism, assist financial institutions, and contribute to retail and commercial growth in a otherwise depressed area. Without destroying the inherent qualities of a structure, they can be adapted, reclaimed, renovated, or reused. Preservation and economic savings can go hand in hand when alternatives are presented in light of often costly mitigation measures. If more economical ways can be found through careful planning, to preserve a resource through avoidance rather than destruction, then saving resources can be economically beneficial to all concerned.

Intellectual and Scientific Values

Cultural resources represent the only viable means of studying the past. Only by studying the past can we learn from our mistakes and hopefully grow from that wisdom to create a better future which will allow our children to live, grow and prosper. We must take care to preserve our heritage in order for it to be preserved.

One British historian profoundly stated, "A people that takes no pride in the accomplishments of its remote ancestors will probably produce nothing worthy of recollection by its remote descendants."

History is, after all, the collective memory of human experience, without which neither individuals or countries can fully understand or appreciate the present or prudently plan for the future. It is difficult to recall the past without tangible, sensory evidence of its existence from which to draw. Although most people may disagree over the value of something historic, few refute the necessity for preserving and protecting it. The reasons for preserving cultural resources are not as easily conveyed to most people, through persuasion or by other means, as by simply seeing or experiencing something already preserved. Once something is fact, it is usually accepted. However, getting to that point of accepting that something should be preserved based on a certain set of predetermined values, is much more difficult. An argument for preservation most assuredly involve building a case based on the past which will have an impact on the present and future. As Shakespeare once said, "All the past is prologue." It all boils down to pride, emotion, and commitment to a cause. . . in this case, the preservation and protection of our heritage.

DEFINITIONS

For the purpose of this Cultural Resources Management Plan, the following definitions apply:

Archaeologist is also known as a certified or qualified archaeologist based on meeting the minimum requirements for conducting either historic, prehistoric, or architectural field work as specified by the Society of Professional Archaeologists (SOPA) or the Society for California Archaeology (SCA). Professional guidelines and standards are provided in the Twenty-first Edition (1996) of the SOPA Directory of Certified Professional Archaeologists.

Archaeological Consulting List. During the initial planning process where a project is determined to require that cultural resource concerns need addressing, the City of Barstow will provide the client a list of potential archaeological consultants who are qualified to conduct archaeological research within the Barstow Planning Area as prepared and distributed by the Archaeological Information Center, San Bernardino County Museum, Redlands.

Cultural Resource is any evidence reflecting the historical development of any land by human life (including prehistoric and historic sites, buildings, architecture, artifacts, sacred areas, or other features which embody psychological, scientific, socio-cultural, religious, political, and/or economic values. Furthermore, these resources are usually fragile, easily susceptible to destruction, and cannot be recreated or replaced.

Cultural Resource Management represents the implementation of an integrated system of Federal, State, County, and local laws, policies, guidelines and procedures aimed at the identification, recordation, evaluation, protection, preservation and enhancement of cultural resources located within a specified sphere of influence.

Excavation is any permitted action requiring physical digging or grading of a project area using mechanical equipment or hand tools, including core sampling, soil borings, work required for placing caissons or footings, planting trees, discing, grubbing, trenching and installation of poles, underground electrical systems, sewers, water mains, or other utilities, or geological/ geotechnical testing.

Monitoring is a condition placed on a project area or portion thereof, requiring the services of an archaeologist or archaeologist and Native American representative to ensure that potentially significant buried cultural resource remains including features, foundations and burials, etc. are not inadvertently destroyed during construction. In all cases, there is an authoritative presentation and basis for implementing a monitoring condition. Usually, the presence of cultural resources within proximity to the project property, or the suspected presence of associated features related to a partially mitigated resource, are sufficient to condition a monitoring clause.

Native American Heritage Commission (NAHC) Most Likely Descendant Referral List represents a listing of Native American representative by county. The individuals, groups or tribes presently on a list kept by the NAHC in Sacramento, indicates tribal affiliation and knowledge or expertise in dealing with Native American cultural resources. It is the Commissions policy to maintain and provide lists of Native American Most Likely Descendants in order to fill its legislative mandates pursuant to Section 5097.98 of the Public Resources code, as well as to assist in the protection of Native American cultural resources by providing information to public and private industry for consultation purposes, and where necessary employment of Native Americans. During the planning process, where cultural resource concerns involving Native American issues are addressed (particularly during Phase 2 and Phase 3 archaeological studies) the City of Barstow will provide the client, a Native American Most Likely Descendants list for selection to assist archaeologists in evaluating the significance of a heritage resource. Archaeologists rather than the client may hire Native American consultants from the NAHC list.

Project Area is also defined as a study area, sphere of influence, or area of potential effect, and represents a specifically delineated geographic, topographic or otherwise demarcated area or locale, which will either be directly or indirectly impacted (a buffer zone of 150 feet should be considered for indirect impacts) by a permit request or scope of work.

Quick Check - A request by the City of Barstow Planning Department to the Archaeological Information Center, San Bernardino County Museum, Redlands for a preliminary inspection of their records to provide a quick response to the client as to whether a project area has been systematically surveyed by a qualified archaeologist, and if so, what restrictions or conditions have been placed on it which may require additional study. If the project area has been previously and satisfactorily surveyed with negative results, a copy of the report should be obtained for that specific project file. If the project area has never undergone a systematic Phase 1 Archaeological Study, then one should be recommended prior to proceeding with the project. If

additional work beyond a Phase 1 Archaeological study is warranted based on the fact that heritage resources exist within or directly adjacent to the project area, then additional work based on the type of study necessary to fulfill legal requirements, should be recommended.

Reporting Requirements - A copy of any reports generated for any cultural resource project phase completed under the purview of the City of Barstow Planning Department shall be forwarded by the applicant's archaeological consultant to the appropriate Archaeological Information Center upon completion. One copy of any report shall also be retained by the Planning Department and filed by the case planner in the appropriate case file. Any archaeological site locational data shall be transferred on a periodic basis to the cultural resource site/survey base maps and updated periodically by any computer graphic system in operation. Project reports shall be removed from case files prior to filing, since the archaeological site data is protected in strict confidentiality, and must not be made available to the general public due to the possibility for vandalism or destruction.

Records Search - The written results of formal review of existing records, maps and documents on file at the Archaeological Information Center, San Bernardino County Museum, Redlands. These results must be referenced and attached as an appendix to the report.

REQUIREMENTS AND PROCEDURES

The Preservation Movement

The preservation movement began in the United States in the mid-1850s, primarily as an attempt by concerned individuals who desired to preserve buildings as well as important historic associations. States and cities like New York and Boston desired to preserve the house that George Washington used as his headquarters during the Revolution and the Old South Meeting House and Old State House. The movement gained impetus and soon expanded to include structures with architectural as well as historical interest. This in turn spawned concern to broaden the scope of preservation intent to include the protection resources associated with significant historical persons and events, and intrinsically valuable architectural examples. By the 1920s Charleston, South Carolina led the way with the establishment of historical districts and providing controls over new development and construction in areas or with regard to specific structures which had important associations with the history of a community, the forerunner to the concept of historic district preservation policy. For the most part, however, early preservation attempts were primarily a private affair funded by the wealthy, historical groups, or concerned citizens without the benefit of legislative support or bureaucratic funds.

Interest in the preservation of heritage resources on a public level inspired Government action to mandate the creation of a system by which our natural and structural resources would be preserved for future generations. This interest in the environment and keeping "special areas" protected, resulted in the creation of Yellowstone National Park in 1872, followed in short order by the protection of the

ruins of Casa Grande in the 1890s. The creation of a National Park System coincided with public concern over the preservation on local and state levels, of historic and archaeological resources throughout the nation. The resulting public concern for preservation of our heritage translated into governmental policies which aimed to create and implement a set of guidelines and policies which would protect the nation's fragile resources.

The establishment of the *American Antiquities Act of 1906*, was followed shortly thereafter by the creation of the National Park Service (NPS) in 1916. The NPS became the focus for much of the Federal activities with regard to heritage protection until the late 1970s. *The Historic Sites and Buildings Act of 1935* laid the foundation for the National Trust for Historic Preservation was established by Congress in 1949. This quasi-governmental body ultimately managed a number of historic properties as well as disseminating information and providing educational programs. The growth of the environmental movement during the 1950s through the 1960s, paralleling governmental preservation programs, began to include historic preservation and other interest in a broad stream of activities which aimed at preserving the "best" representations of our physical environment. Following, is a summary of various Federal and State mandates and legislative enactments which deal with cultural resources.

Antiquities Act of 1906

The responsibility for managing cultural resources on a Federal level, was initiated with the passage of the Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225; 34 Stat. 225; 16 U.S.C. 431-433). This piece of legislation provides for the protection of historic and prehistoric remains, "or any antiquity," on Federal lands; establishes criminal sanctions for unauthorized destruction or appropriation of Federally owned antiquities; and authorizes through a permit system the scientific investigation of antiquities on Federal lands. The uniform rules and regulations charge the Secretaries of the Interior and of Agriculture to carry out the provisions of the Act by providing guidelines requiring that institutions undertaking archaeological research and curation capacity, obtain Federal permits, and submit reports. Furthermore, any collections resulting from the implementation of the Act must be made available to the public.

The Antiquities Act of 1906 authorizes the President to designate as national monuments historic and prehistoric landmarks in Federal ownership. Permits for archeological research and excavation are required; and criminal penalties discourage illegal excavation and vandalism. No policy as such is stated. The first line describes the legislation as "An Act for the Preservation of American Antiquities." Intended to stem the destruction of prehistoric sites and artifacts in the West, this act established a system for protecting such resources located on Federal lands.

The Historic Sites Act designates the Secretary of the Interior as being responsible for establishing the National Survey of Historic Sites and Buildings; requiring the preservation of properties "of national historical or archaeological significance"; and, the designation of national historic landmarks while authorizing interagency,

intergovernmental, and interdisciplinary efforts for the preservation of such resources. The act authorizes the Secretary of the Interior to identify historic sites, buildings and objects of national significance, to acquire and preserve some of them in Federal ownership, and to assist in preserving others through cooperative agreements and contractual arrangements. The law declares "that it is a national policy to preserve for public use historic sites, buildings and objects of national significance for the inspiration and benefit of the people of the United States."

The Reservoir Salvage Act of 1960

This Act provides for the recovery and preservation of "historic and archaeological data" that might be lost or destroyed as a result of the construction of Federally funded or licensed dams, reservoirs, and attendant facilities and activities (this law was extensively amended in 1974 by P.L. 93-291). *The Reservoir Salvage Act of 1960* directs any agency of the United States before undertaking the construction of a dam or issuing a license to a corporation or private individual for same, to "give written notice to the Secretary of the Interior setting forth the site of the proposed dam and the approximate area to be flooded or otherwise changed" by such construction. The Act also directs the Secretary of the Interior upon receipt of a notice to "Cause a survey to be made of the area proposed to be flooded to ascertain whether such area contains historical and archeological data (including relics and specimens) which would be preserved in the public interest.

If as a result of any such survey, the Secretary shall determine (1) that such data exists in such area, (2) that such data has exceptional historical or archeological significance, and should be collected and preserved in the public interest, and (3) that it is feasible to collect and preserve such data, he shall cause the necessary work to be performed in such area to collect and preserve such data." The law declares "that it is the purpose of this Act to further the policy set forth in (*The Historic Sites Act of 1935*), by specifically providing for the preservation of historic and archeological data (including relics and specimens)" threatened with loss or destruction by virtue of the construction of a dam by "any agency of the United States or by any private person or corporation holding a license issued by any such agency".

The Department of Transportation Act of 1966

This Act directs that the Secretary of Transportation shall not approve any program or project which requires the use of any land from a historic site of national, State, or local significance unless there is no feasible or prudent alternative and the program includes all possible planning to minimize harm resulting from such use. This authority is given by Section 4(f) of the Act. The law states that, "It is hereby declared to be the national policy that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

The National Historic Preservation Act of 1966 (NHPA)

Within the context of this Act, national policy for historic preservation is set forth, including the encouragement by matching grants of state and private efforts. This Act defines the term *historic preservation* as "the protection, rehabilitation, restoration, and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, or culture"; establishes the 'President's Advisory Council on Historic Preservation' to coordinate Federal, state and local efforts in the field of preservation; encourages states to conduct statewide surveys and prepare 'State Historic Preservation Plans'; authorizes grants by the 'Secretary of the Interior' to the states to support surveys, planning, and preservation activities; and prescribes certain procedures (*Section 106*) to be followed.

The law states "The Congress finds and declares - (a) that the spirit and direction of the Nation are founded upon and reflected in its historic past; (b) that the historical and cultural foundations of the Nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people; (c) that, in the face of ever-increasing extensions of urban centers, highways, and residential, commercial, and industrial developments, the present governmental and non-governmental historic preservation programs and activities are inadequate to insure future generations a genuine opportunity to appreciate and enjoy the rich heritage of our Nation; and (d) that, although the major burdens of historic preservation, have been borne and major efforts initiated by private agencies and individuals, and both should continue to play a vital role, it is nevertheless necessary and appropriate for the Federal Government to accelerate its historic preservation programs and activities, to give maximum encouragement to agencies and individuals undertaking preservation by private means, and, to assist State and local governments and the National Trust for Historic Preservation in the United States to expand and accelerate their historic preservation programs and activities."

The National Environmental Policy Act of 1969 (NEPA)

The National Environmental Policy Act (NEPA) of 1969 set the tone for the Federal agency responsibility by establishing that the agency has the responsibility to identify the cultural resources within a project's potential environmental impact area. *Section 106(4)* provides for the continuing Federal responsibility to preserve historic, cultural and natural aspects of the environment. The Act states that "it is the continuing responsibility of the Federal Government to use all practical means, consistent with other essential consideration of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may "...preserve important historic, cultural, and natural aspects of our national heritage." The law requires Federal agencies to consider the impact of their proposed activities upon the environment, including historic and cultural resources.

The basis of all cultural resource management plans and programs is *The National Historic Preservation Act of 1966* which established the procedures that Federal agencies must follow if a project under their jurisdiction has the potential to affect

significant properties. These procedures are set forth in *Section 106*, and the significant properties are those which are eligible for nomination to the National Register of Historic Places. Among the many facets of this legislation was the expanding of the National Register to include properties of regional, state or local significance as well as those of national significance as established by the *Historic Sites Act of 1935*.

Section 106 of the National Historic Preservation Act states: The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or Federally assisted undertaking in any State and the head of any Federal or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking.

The amendment to the *National Historic Preservation Act* requires management and planning actions be extended to those properties that may be eligible for the Register. This amendment reinforces the provisions of *Executive Order: 11593*; Section 2b, summarized below, outlines the responsibilities of the Federal agency to: (a) No later than July 1, 1973, locate, inventory, and nominate to the Secretary of the Interior all sites, buildings, districts and objects under their jurisdiction to the National Register of Historic Places, and the significant properties are those which are eligible for nomination to the National Register of Historic Places; (b) Exercise caution during the interim period of the inventory to insure that no potentially eligible property is transferred, sold, demolished or substantially altered; (c) Initiate measures where as a result of Federal actions or assistance a National Register of Historic Places property is to be substantially altered or demolished; timely steps are to be taken to insure adequate mitigation measures are undertaken; (d) Initiate measures and programs to provide the maintenance, preservation, protection, and restoration of Federally owned registered sites; (e) Submit procedures required pursuant to Subsection (d) to the Secretary of the Interior and to the Advisory Council on Historic Preservation no later than January 1, 1972, and annually thereafter, for review and comment; (f) Cooperate with the purchasers and transferees of registered NRHP properties in the development of viable plans to use that property in a manner compatible with preservation objectives which does not present an unreasonable economic burden to public or private interests.

Executive Order 11593 of May 13, 1971 - Section 1 (EO 11593)

Executive Order 11593 states that "The Federal Government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation. Agencies of the Executive branch of the Government... shall (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, (2) initiate measures necessary to direct their policies, plans and programs in such a way that Federally owned sites, structures, and objects of

historical, architectural or archeological significance are preserved, restored and maintained for the inspiration and benefit of the people, and (3) in consultation with the Advisory Council on Historic Preservation... institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-Federally owned sites, structures and objects of historical architectural or archeological significance."

This law directs Federal agencies to assume the leadership in preserving and enhancing the Nation's cultural heritage to survey and nominate to the National Register historic properties under their jurisdiction, to refrain from impairing historic properties under their control, and to initiate measures to ensure that their programs and policies contribute to the preservation and enhancement of non-Federally owned historic resources.

The Archaeological and Historic Preservation Act of 1974 (AHPA)

The primary purpose of the Act was to amend *the Reservoir Salvage Act of 1960* to expand the application of the 1960 Act, providing for the preservation of scientific prehistoric, historic, and archeological data to include all Federal or Federally assisted or licensed construction projects rather than being limited to Federal dam and reservoir sites. The law places coordinating responsibility in the Secretary of the Interior so that a relatively uniform Federal program should be assured; provides an authorization to all Federal agencies whereby they can seek future appropriations, obligate available monies or reprogram existing appropriations for the recovery, protection, and preservation of significant scientific, prehistoric, historic, or archeological data; and permits agencies to either undertake the requisite recovery, protection, and preservation themselves in coordination with the Secretary of the Interior or, alternatively, to transfer a maximum of one percent of the total amount authorized to be appropriated for each project.

The Act specifically provides a mechanism for preserving archaeological and historical cultural resources as follows: Section 1(2) - Any alteration of the terrain caused as a result of any Federal construction project or Federally licensed activity which affects cultural resources is covered by this Act. Section 3(a) - Outlines the procedures by which the Secretary of the Interior must be notified in writing by any Federal agency who finds or is notified in writing that a project under its jurisdiction may cause irreparable loss or destruction of significant scientific prehistoric, historic or archaeological data. This notification shall detail the appropriate information concerning the project and its probable effect on the resource. The agency may request the Secretary to undertake the recovery, protection and preservation of such data or may with funds appropriate for said project, undertake such activities; Section 3(b) - Outlines that the procedures are also applicable to any Federally assisted project; Section 4(a) - If the Federal agency cannot institute adequate protection or investigative measures, it becomes the explicit responsibility of the Secretary of the Interior to assume those responsibilities. Section 7(a) - Outlines the procedure by which the Federal agency will specify up to 1% of the total amount of the project funds to assist the Secretary of the Interior or transfer that amount to his control to aid in the procedures outlined by this Act.

The Federal Land Policy And Management Act of 1976

The Act states "...that it is the policy of the United States that (1) the public lands be retained in Federal ownership, unless as a result of the land use planning procedure provided for in this Act, it is determined that disposal of a particular parcel will serve the national interest; (2) the national interest will be best realized if the public lands and their resources are periodically and systematically inventoried and their present and future use if projected through a land use planning process coordinated with other Federal and State planning efforts...; (4) the Congress exercise its constitutional authority to withdraw or otherwise designate or dedicate Federal lands for - specified purposes and that Congress delineate the extent to which the Executive may withdraw lands without legislative action...; (7) goals and objectives be established by law as guidelines for public land use planning, and that management be on the basis of multiple use and sustained yield unless otherwise specified by law; (8) the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wild life and domestic animals, and that will provide for outdoor recreation and human occupancy and use....". The law requires that the Secretary of the Interior "prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values..."; develop, maintain, and, when appropriate, revise land use plans which provide by tracts or areas for the use of the public lands; carry out the provisions of this act through the Bureau of Land Management; manage the public lands under the principles of multiple use and sustained yield in accordance with the land use plans developed by him under section 202 of this Act ..."; and "regulate, through easements, permits, leases, licenses, published rules, or other instruments as the Secretary deems appropriate, the use, occupancy, and development of the public lands....".

Other Relevant Pieces of Legislation

Additional, relevant legislative enactments include, *The President's Memorandum on Environmental Quality and Water Resources Management (July 12, 1978)* which directs Federal agencies with water and related land resource responsibilities and programs to publish procedures implementing 36 CFR 800. *The American Indian Religious Freedom Act (92 Stat. 469)* which establishes as policy of the United States the protection and preservation of the Native American Indians' inherent right to the freedom to believe, express and exercise their traditional religious practices. Native American leaders should be consulted to determine the potential effect of any agency's actions upon Native American activities.

COMPLIANCE WITH SECTION 106

Compliance procedures are manifested in Sections 106 and 110 of the NHP Section 106 requirements of the NHPA as defined in regulations of the Advisory Council on Historic Preservation, "Protection of Historic and Cultural Properties (36 CFR 800).

Briefly, the "Section 106 review" process applies to any property listed in, or eligible for (even if as yet undiscovered), the National Register of Historic Places. It is intended to identify eligible properties, determine the effect of a project on the property, and, if there is an adverse effect, provide ways to avoid or reduce it. Section 110(16 U.S.C. 470h-2) requirements are general and not project specific: "...each Federal agency shall establish a program to locate, inventory, and nominate to the Secretary all properties under the agency's ownership or control by the agency, that appear to qualify for inclusion on the National Register...".

EVALUATION OF SIGNIFICANCE

As a means of evaluating resources with a potential to yield significant data, a criterion of eligibility has been established from which general research goals can be proposed to address the specifics of a site or feature. These goals are aimed at examining and documenting such broad behavioral patterns as: ethnicity, acculturation and interaction; the organization and utilization of space by individuals or groups; changing land use patterns; the length and duration of occupation; technological advances and contributions; and, specialized activities and occurrences. In order to address such concerns, background historical research has as its primary objectives, the identification and evaluation of the cultural resource base utilizing the following criteria:

- Contextual association which provides the cultural affiliation or its place in time, its relationship to a person or event, or its architectural value.
- Integrity which will address the sense of location, design, setting, materials, workmanship, feeling, or association.
- The level of significance which is based in part on contextual association and resource integrity.

Evaluation of significance criteria under the *California Environmental Quality Act* (CEQA), based on guidelines established by *the National Register of Historic Places* (NRHP), is described in detail in "The Evaluation of Significance" subsection to the "Planning Procedures: The Permit/Case Process for all Projects" found later in this report.

MANAGEMENT RECOMMENDATIONS

In general, archaeology and history attempt to answer questions about human nature and human history in a changing environment. Answering these questions can help aid in a better understanding of ourselves and the world around us, and better prepare us for our future. Further, research directives can also contribute to public awareness and understanding and hence the appreciation of specific events in the past.

Included within the implied concept of protection, preservation and enhancement of cultural resources are such dynamics as: social interaction and change; revitalization;

economic growth and development; political dynamics; technological innovations and changes; and, artistic and creative forces. Everything that makes up the past human condition is a source of potential knowledge to learn from and extract information which can aid in our own survival.

Impacts to cultural resources are identified by comparing plans for land alteration with the location of individual resources. The extent of the impact can be measured by the amount of scientific information which will be lost upon implementation of the project. Direct impacts destroy the information that is present within a cultural resource(s) through the removal of the material remains which contribute to the integrity of the site (location, design, setting, materials, workmanship, feeling, and association). Indirect impacts tend to affect a resource(s) by significantly enhancing the possibility of destruction through increased access or awareness, usually resulting in vandalism. Alleviating potentially adverse impacts to cultural resources through mitigation measures is the basis for all cultural resource management recommendations.

ENVIRONMENTAL CONTEXT

INTRODUCTION

The General Plan area lies within the Western Mojave study area as defined by the Bureau of Land Management (Coombs, 1979; and Stickel and Weinman-Roberts, 1980), an area encompassing over 11,000 sq km (4,000 square miles). The population for this environmentally unique region, comes from a number of communities which dot the landscape, including Barstow, Victorville, Lucerne Valley, Yucca Valley and Twentynine Palms. According to Bailey (1966), the Western Mojave region is defined as high desert, having generally greater valley elevations, slightly higher annual rainfall, and somewhat cooler maximum temperatures than most other parts of the Mojave.

PHYSIOGRAPHIC SETTING

A majority of the Western Mojave contains low pediments and shallow basins with surface soils covered by recent alluvium, or desert pavement which protect it from sheet-wash and channeling. Structurally, these deposits exhibit a well-sorted grading from cobble-pebble alluvial fans to fine sands on the basin floors. The playa areas are composed of fine silts and clays and are often rimmed with dunes and wind-blown sand.

Basins are found throughout the Western Mojave, with the largest number located in Johnson and Lucerne Valleys at the base of the San Bernardino Mountains. The Mojave drainage is the only river system in the area, and it drops 427 meters (1,400 feet) as it traverses the area, from 915 meters (3,000 feet), at its source in the San Bernardino Mountains, to 640 meters (2,100 feet) as it passes through Barstow, to 488 meters (1,600 feet) as it exits the study area near Afton Canyon. The Mojave River has created its own characteristic alluvial deposits or river sand and gravel terraces. Additionally, its slow degradation of the topography has exposed some of the

earlier Pleistocene alluvium units formed by ancient Lake Manix near the eastern edge of the study area.

Mountain Regions

According to Hewett (1954), Dibblee (1964) and Coombs, et al. (1979), all mountainous areas within the western Mojave Desert are characterized by slopes generally greater than 45 degrees, with upper slopes often consisting of talus and areas of exposed, fractured bedrock. The predominant geologic formations are Mesozoic or pre-Mesozoic quartz-bearing granites, with a number of volcanic flows intruding into the them. These formations range from small dikes and fissures to massive exposures like the Black Mountains and the lava buttes of the Joshua Tree and Yucca Valley area. Within the mountain region classification, four sub-areas have been defined as variations within the mountain physiographic setting as follows:

- *Sub-area 1* is typical of the eastern terminus of the Antelope valley where basin elevations are generally 2200 feet (671 m.) and contain small, isolated mountains or hills, surrounded by a broad plain and include the Shadow Mountains (4043 feet/230 m.) and Iron Mountain (3065 feet/935 m.), in addition to a number of smaller formation similar to Red Hill.
- *Sub-area 2* extends down to the area north of Apple Valley and contains a number of mountain ridges that rim several large basin and smaller valley extensions. These ridges include the Opal Mountains (3950 feet/1204 m.), the Alvord Mountains (3456 feet/1054 m.), the Calico Mountains (4542 feet/1385 m.), Stoddard Ridge (4712 feet/1436 m.), and Sidewinder Mountain (5275 feet/1607 m.). The larger ridges follow no regular pattern and are interspersed with a number of isolated hills or buttes. Elevations of the basins vary from Superior Dry lake (3009 feet/917 m.) to Coyote Dry Lake (1703 feet/519 m.).
- *Sub-area 3*, encompasses the Ord Mountains (6309 feet/1923 m.), the Newbury Mountains (4829 feet/1472 m.) and Rodman Mountains (6010 feet/1832 m.). Additionally, several smaller mountain range systems are included (the Fry and Granite and southwestern portion of the Cady mountains, and Iron Ridge). The Rodman and Newbury systems represent the only large block of uninterrupted mountainous territory in this region and are considered the northern extension of the larger Bullion Mountains to the southeast.
- *The San Bernardino Mountains* are a distinctive mountain area in the Western Mojave due to their massive size and proximity to the California Coast. Geologically, they are very similar to the other mountains within the Western Mojave Desert region. However, a cooler climate with more precipitation, higher elevation, different vegetation zones and hydrology patterns, and diverse topography make this sub-area distinct from the other regions within the Mojave Desert.

Basin Regions

The fourteen defined basins located within the Western Mojave range in size from two square miles (5.2 sq km) at Tyler Valley, to over 151 square miles (391 sq km) in the south end of Superior Valley, with the average approximately 57 square miles (148 sq km). The largest number of basins are located in Lucerne and Johnson valleys near the base of the San Bernardino Mountains. The Johnson Valley area can be characterized as a poorly-defined trough which collects runoff from the Transverse Range and the Rodman Mountains. The large number of dry lakes in this area is largely the result of the combination of fault action at the base of the trough and an unusually large number of active runoff sources.

PLANTS (FLORA)

Differences in geology, slope and elevations in the Western Mojave are reflected in various vegetation zones, and are further discussed in Jager (1957), King (1976), Vasek and Barbour (1977), and Coombs et al. (1979). Two major plant communities dominate the region including the Creosote Scrub community, and the Saltbush Scrub community. Common vegetation includes creosote bush (*Larrea varicata*), blackbrush (*Coleogyne ramosissima*), burro bush (*Ambrosia dumosa*), saltbush (*Atriplex* sp.), loco weed (*Astragalus layneae*), round-leaf rabbit brush (*Chrysothamnus teretifolius*), indigo bush (*Dalea* sp.), mormon tea (*Ephedra* sp.), wild buckwheat (*Eriogonum fasciculatum*), bladder pod (*Isomeris arborea*), juniper (*Juniperus* sp.), cactus (*Opuntia* sp.), mesquite (*Prosopis glandulosa*), bladder sage (*Salazaria mexicana*), chia (*Salvia columbariae*), desert sage (*Salvia mohavensis*), desert needlegrass (*Stipa speciosa*), and yucca/our Lord's candle (*Yucca* sp.).

The area confined to the San Bernardino Mountain area of the Western Mojave, generally found above 4500 feet (1372 m.), is distinguished from other communities by the occurrence of *Pinus monophylla*, *Juniperus osteosperman*, *Juniperus californica*, *Quercus turbinella*, and *Haplopappus linearifolius*. The community grades into the Pinon Juniper zone as it extends downward to approximately 3000 feet (915 m.). The Joshua trees (*Yucca brevifolia*) favor gentle slopes and loose soils, with two major strands occurring west and south of Victorville and in the Joshua Tree National Park. Otherwise they are sparse. The Creosote Scrub is by far the most extensive plant community in the Mojave Desert. There is an extensive list of plant species which are often associated with *Larrea tridentata* (creosote bush) which is most often associated with *Ambrosia dumosa*. Finally, the Saltbush Scrub community is the lowest of the major western Mojave vegetation zones containing plants which have a high tolerance for large concentrations of salt and alkaline soils.

Native Americans who occupied the Mojave Desert, probably found it to be a harsh environment with relatively sparse vegetation. Extracting resources for their survival became a primary focus. Because plants fulfilled many aboriginal biological and social needs, a high degree of efficiency in plant exploitation was necessary. If a plant possessed qualities useful for food, medicine, clothing, shelter, ornamentation,

or ceremony, it can be assumed that by trial and error experimentation or diffusion of information from neighboring groups, early peoples of the Mojave Desert became aware of these qualities (Davis, et al. (1981:18). A listing of ethnographic uses for plants may be found in, Balls (1972), Bean and Saubel (1972), Wildesen (1974), Brooks, et al. (1975), King (1976), and Laird (1976).

ANIMALS (FAUNA)

There is a great diversity of faunal habitats in the study area (King, 1976). Dominant reptile species consist of zebra-tailed lizard (*Callisaurus draconides*), western whiptail lizard (*Cnemidophorus tigris*), rattlesnakes (*Crotalus* sp.), desert tortoise (*Gopherus agasizli*), desert horned lizard (*Phrynosoma platyrhinos*), and chuckwalla (*Sauromalus obesus*). Dominant birds include sage sparrow (*Am phispiya belli*), golden eagle (*Aquila chrysaetus*), great horned owl (*Bubo virginianus*), redtailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), common raven (*Corvus corax*), prairie falcon (*Falco mexicanus*), sparrow hawk (*Falco sparverius*), roadrunner (*Geococcyx californianus*), and Gambels' quail (*Lophortyx gambelii*). Dominant mammals include round-tailed ground squirrel (*Ammospermophilus leucurus*), coyote (*Canis latrans*), Merriam kangaroo rat (*Dipodomys merriami*), black-tailed hare (*Lepus californicus*), bobcat (*Lynx rufus*), desert woodrat (*Neotoma lepida*), long-tailed pocket mouse (*Perognathus formosus*), cactus mouse (*Peromyscus eremicus*), cottontail rabbit (*Sylvilagus auduboni*), and, kit fox (*Vulpes macrotus*).

GEOLOGY

Geologically speaking, a majority of the region consists of unconsolidated recent alluvium, the product of coalesced alluvial fans. Quaternary lake deposits can also be found nearby. Soils in the general area consist of mixed alluvium derived from granitic sources found in alluvial fans and river terraces which are very deep, nearly level, and moderately to excessively well drained. The Mojave River is the main drainage course for the region, and flow is primarily underground, except where bedrock at a shallow depth forces water to the surface.

The ranges of the Sonoran Desert are basically the result of extensive block faulting followed in many areas by volcanism. Crystalline igneous rocks (granite, schist and gneiss) form the core of the ranges with overlying layers of sedimentary and volcanic rock. A number of volcanic flows intrude into the igneous formations, and, Cenozoic volcanic, Tertiary intrusive and Jura-Triassic meta-volcanic rocks become locally available. These materials were no doubt, sources for the unusually beautiful silicate stone that appears in flake scatters of archaeological sites found throughout the area (Davis, Eckhardt and Hatley, 1981: 16).

In the Mojave Desert, a number of lithic resources were available to the Native American inhabitants (Heizer and Treganza, 1972). Material classifications aid not only in defining the situational circumstance in which particular cultural elements occur, but in the discovery of varieties which may or may not be culturally induced. In some cases, they may result in recognition of sources of procurement (quarry versus

float), lithic technology, and in better establishing and/or defining intra- and inter-tribal or cross-cultural trade associations.

Several rock types most commonly found as modified and altered forms in prehistoric resource sites in this region include: Rhyolite, which occurs locally in such colors as green, grey, red-brown, purple, and tan; Andesite, which occurs as intermediate in color between rhyolite and basalt; Basalt relatively dark in color, with black and grey being common. Although the local basalts may have a greenish tinge; Felsite is a catchall term used to describe any volcanic rock which is not readily identifiable; local Quartzite is tough and dense, frequently found in cobble float or beds, and are white, grey, tan, red, brown, and black in color; Chalcedony includes specimens which might otherwise be known as agate, jasper, chapanite, and chert. Chalcedonies reported from local prehistoric resource sites range from translucent, white, pink, red, brown, and tan to innumerable combinations of some or all of the spectrum. Obsidian is distinguished by its dark grey to greyish blue and black color, as well as its vitreous luster (Davis, Eckhardt, and Hatley, 1981:60-62).

CLIMATE

The climate is typical continental high desert, and classified as arid to semi-arid, with evaporation greatly surpassing precipitation. Averaging 118 days a year with temperatures above 90 degrees and approximately 50 days with freezing temperatures the median rain fall is approximately four inches and prevailing winds are from the west-southwest at 10 miles/hour. Occasional gusts in excess of 145 km/hour (90 miles/hour) are not uncommon. Maximum summer temperatures reach approximately 130 degrees Fahrenheit (54 degrees Celsius), with winter temperature dropping to 0 degrees Fahrenheit (-18 degrees Celsius).

Due to the blockage of waterladen air masses by the Transverse Mountain Range and other border ranges, the Mojave receives very little moisture. The majority of precipitation occurs during the winter months, and it is not uncommon to see snow. Infrequent summer rains are usually short-lived thunderstorms which are usually localized and sometime severe. The Western Mojave enjoys slightly cooler maximum temperatures and somewhat more precipitation than other portions of the Mojave at similar elevations (Cooke and Warren 1973; and Coombs et al 1979).

Past conditions in the project area have ranged from cool/moist to dry/hot, and creating some significant changes in the configuration of the landscape over the last 40,000 years. Evidence of what are often termed paleo-environmental changes are well preserved in the ancient lake beds which were located in many of the basin areas in the Western Mojave, and are particularly evident at Lake Manix and Lucerne Lake. On the basis of faunal remains, researchers have been able to show that there were pinon and juniper woodlands covering the Rodman, Newberry and Ord Mountains approximately 12,000 years ago, while juniper woodlands covered the area until around 8,000 years ago.

CULTURAL/HISTORICAL OVERVIEW

Ethnography

At the time of Spanish contact, the project area was occupied by the *Vanyume* Native American group. Little is known of the *Vanyume* other than they appear to be a small population of hunters and gatherers exploiting a large area between the *Kitanemuk* to the west, the *Serrano* to the south, the *Kawaiisu* to the west, and the *Chemehuevi* to the north and east (Greenwood and McIntyre, 1979:28). Their territory centered along the Mojave River from the Daggett-Barstow area eastward about one-third of the way from the river to the Providence Mountains, and westward to the *Serrano* territory. Major ethnographic references for the *Vanyume* include: Gifford, 1918; Kroeber, 1925; Strong, 1929; Drucker, 1987; Forbes, 1963; and Bean and Smith, 1978).

Vanyume is a Mojave name for the people Kroeber (1925:614) refers to as the *Serrano* of the Mojave River. This grouping with the *Serrano* could stem from the fact that several *Serrano* clans are located in or immediately adjacent to *Vanyume* territory. These are *Amutcakaiem*, south of Victorville at the base of the San Bernardino Mountains; *Maviatum*, in the vicinity of Victorville; *Kaiyuwat*, immediately east of *Maviatum*; and *Amakhavit*, east of *Kaiyuwat* (Gifford, 1918; Strong, 1929).

Garces described a group that the *Mohave* called *Beneme* (*Vanyume*) living along the Mojave River (Coues, 1900). Although Garces thought that the *Beneme* were different from the *Mohave* and the *Chemehuevi* and seemed to speak a language related to that spoken in the San Gabriel Valley, along the Santa Clara River, and near present-day San Bernardino (i.e., a Takic language), there remains some doubt as to whether this population was related to the *Serrano* as Kroeber ascertained (Schneider, 1988:32). When Kroeber wrote his descriptive ethnographic accounts and drew his cultural boundary maps, the *Vanyume* had been extinct for more than 25-30 years (Bean and Smith, 1978:570).

Most of the information attesting to the existence of the *Vanyume*, comes from the Garces account and from *Mohave* and *Chemehuevi* informants. At historic contact, the *Vanyume* were living along the lower Mojave River. However, in late prehistoric times, the central Mojave Desert was probably united by several contemporaneous aboriginal groups. A good deal of interaction and cultural exchange most certainly took place. The presence of different groups at different times and in different locations was probably influenced by economic and political factors in outlying areas and related to exchange of goods and availability of resources, although environmental factors surely played some part (Schneider, 1988:33-34).

The *Vanyume* became extinct through missionization in the 1770s, with the *Chemehuevi*, *Mojave*, *Serrano*, and possibly *Chumash* moving into their area after contact (Greenwood and McIntyre, 1979:28); Forbes, 1963; and, Barker and Schlanger, 1974). Some researchers believe them to have been members of the

Serrano language family, but possibly spoke a separate Shoshonean language (Stickel and Weinman-Roberts, 1980:98). They were foragers of the desert, an ecology type which has been described as "an impoverished extension of the Great Basin culture" (Beals and Hester, 1971:81). To date, no site or population figures exist (Stickel and Weinman Roberts, 1980:98). Since little is known about the *Vanyume*, and most existing information, though not universally accepted, suggests certain affinities to the *Serrano*, relevant behavioral information with applicability to the *Vanyume* was extrapolated from the *Serrano*.

The *Serrano* consisted of autonomous localized groups related by blood (i.e. sibs) whose exact boundaries were impossible to delineate. The landholding lineages were further divided into interrelated clans (technically called exogamus, totemic moieties) with ritual and ceremonial obligations (Kroeber, 1925:615-616). Each clan retained control over several areas (usually a creek and the strip of land surrounding it) from which they gathered their food resources during the course of the year (Strong, 1929). They were also part of a larger trade network (Davis, 1974:36-37). Coalitions with other *Serrano* clans were based on reciprocal ceremonial, marital and economic relationships. They also established alliances with similarly organized *Cahuilla*, *Chemehuevi*, *Gabrielino*, and *Cupeno* (Strong, 1929; Bean, 1972).

Primary *Serrano* villages were located in the foothills of the San Bernardino Mountains, with some settlements situated in higher transitions zones as well as along the desert floor. Access to water was the determining factor in selecting habitation sites. They lived in single-family dwellings which were circular, domed structures constructed over an excavated area. The houses had willow frames covered over with tule and brush mats secured to the framework, and served primarily as sleeping areas. A majority of the activities took place outside or under roofed structures without walls, called ramadas. The only other buildings in the villages were ceremonial houses occupied by the village priest and used for religious rites and ceremonial activities, and a granary for storing provisions (Stickel and Weinman-Roberts, 1980:99).

The *Serrano* were accomplished potters and basket makers. Their pottery was made of coiled clay, smoothed with a paddle and dried in the sun before being fired in a pit. Baskets were fabricated from yucca fiber, willow, reeds, and local grasses. Their artifact inventory included: musical instruments such as rattles, flutes, and whistles and utensils and ornaments, such as fire drills, pipes, mortars, metates, beads, pendants, awls, and projectile points from wood, shell, bone and stone. Petroglyphs abound on rock surfaces in the *Serrano* territory. Abstract and geometric designs are interspersed with representational figures of sheep, lizards, human beings, and possible celestial bodies. They are typical of those found throughout the Great Basin area.

The *Serrano* sustained a hunting and gathering economy, exploiting virtually every possible food resource in their environment. Hunting was generally the task of the males who used bows and arrows, throwing sticks, traps and snares, to catch deer, antelope, mountain sheep, rabbits, and other rodents, and various birds, especially quail. The women collected seeds, tubers, roots, acorns and pinon nuts. Although they

did not engage in agricultural activities per se, the Serrano manipulated the natural plant environment by annually harvesting the acorn crop and by burning areas where chia seeds grew, thereby increasing the yield (Stickel and Weinman-Roberts, 1980:100). Abandonment of the permanent Anasazi settlements in the southern parts of Nevada and Utah at the beginning of this period ended their influence in the Mojave. At this time, there is a noticeable change in point types, as the Cottonwood series and the small Desert Side Notched series become the predominant types. These points are generally associated with the Numic expansion throughout much of California and the Great Basin.

A few occurrences of Colorado River pottery types in the western Mojave attest to influences from these *Hakataya* groups. *Hakataya* occupations have been reported in the Cronese Basin, just east of the study area. From ethnographic accounts, there is evidence of other movements of these Colorado River peoples. It is reported that during the 17th and 18th centuries, the central portion of the Mojave was abandoned by the *Mojave* Indians and the area was occupied by the *Chemehuevi*. More recent occupations are discussed in the following section.

The Historic Period

The history of San Bernardino County can be found by consulting Frazee (1876), Guinn (1907), Iimke (1944); and Beattie and Beattie (1951). A majority of the historical summary provided in this section was extracted from The Archaeology of the Western Mojave (Coombs 1979).

The establishment in 1769 of the first Spanish mission, San Diego de Alcala, stimulated the exploration and charting of Southern California. Nonetheless, by 1776, the Anza route between the California coastal missions and the Arizona and Sonora regions was scarcely known because of the severe desert crossing. Although this route was situated far south of the study area, its discontinued use after the Yuma Indian insurrection of 1781 led to an extensive search for a more northerly route.

At the time of European intrusion, the *Western Mojave* was largely occupied by two aboriginal groups, the *Serrano* and *Vanyume*. The *Serrano* occupied territory east of Cajon Pass in the San Bernardino Mountains, as far as Twentynine Palms, including the Victorville region, and as far south as Yucaipa Valley, outside the study area. The *Vanyume* were a sparse, poor population that lived along the Mojave River. While the *Vanyume* language is unknown, they were likely members of the Serrano language family (Bean and Smith 1978: In 1776, Francisco Garces pioneered a route through the Mojave Desert. Guided by *Mojave* Indians, Garces traveled an ancient trail from the *Mojave* villages at the Colorado River to Soda Springs (South of Soda Lake), then up the Mojave River. Garces crossed the river near a point later named "Forks in the Road", near the present town of Yermo. Garces traveled generally up the Mojave River drainage to the foothills of the San Gabriel and San Bernardino Mountains (Hafen 1954: 73-81); he had completely traversed the Western Mojave before reaching the San Gabriel Mission.

Garces journeyed into the San Joaquin Valley before returning to the Mission at San Gabriel. His route across the Mojave Desert varied slightly from the first trail, but Garces returned to the *Mohave* villages, demonstrating that a northern route was possible across the California Desert. However, although an alternative to the Sonora route had been found, the significance of the Mojave Trail went unrealized for many decades. Garces was killed in the 1781 Yuma uprising, and in the next forty years few non-Indians crossed the Western Mojave. The only exceptions documented are travelers along the eastern Sierra Nevada foothill trail between the Cajon Pass and Oak Creek (Warren and Roske 1978). Garces called all the *Serrano* and *Vanyume* by the name "*Beneme*"--- his interpretation of the *Mohave* Indian name for these people. His accounts are among the earliest descriptions of these tribes. On two separate occasions during his trek along the Mojave River, Garces was cordially greeted by the "*Beneme*." Of one instance he writes: "In this rancheria, they regaled me with hares, rabbits, and great abundance of acorn porridge, where with we relieved the great neediness we had" (Hafen 1954: 77). The missionization process disrupted the social organization of both of these groups. The *Vanyume* were absorbed rather quickly by missions or mission associated facilities called "assistencias" and, as an ethnic group, were extinct before 1800. While the *Serrano* living near the coast and in the San Bernardino Mountains were moved bodily to the missions, the northeastern *Serrano* maintained some autonomy. Today, *Serrano* people are found mainly on the Morongo and the San Manuel reservations.

The Western Mojave region was crossed again by the Spanish in 1819. Gabriel Moraga led a punitive expedition of about fifty men, following the Mojave Trail eastward in pursuit of fleeing *Mohave* Indians. The party followed the Mojave River into the desert around Kelso, where they ran short of supplies. Although the party had been able to follow the trail along the river, once in the open desert, Moraga became lost and turned back (King and Casebier 1976: 284).

Between 1827 and 1831, several expeditions from the east crossed the California Desert, and trade and travel routes were established. Jedediah Smith (1826 and 1827), Ewing Young (1829), and the Wolfskill-Young party (1830-31) all followed the Mojave Trail across the desert, through the Western Mojave and into the San Bernardino Mountains. Antonio Armijo (1829-30) entered California farther north, forging a trail that veered south and met the Mojave River near the study area. Between 1830 and 1848, these alternate routes became major lines of communication between Alta California and New Mexico.

In 1829-30, Antonio Armijo journeyed from New Mexico in search of a commercial trade route to California. While it has traditionally been accepted that Armijo's route entered California near Pahrump Valley, finally meeting the Mojave River in the Barstow area, recent research by Elizabeth von Till Warren suggests that later caravans entered further south, near Paiute Valley, linking up with the Mojave Trail east of the study area (Warren, 1974: 79-81). It seems likely that the more southerly route proposed by Warren became the Old Spanish Trail, although some other alternate routes were probably limitedly used: Armijo's route near Death Valley via the Amargosa River was known, although it was little used until the 1850's when it

became the Salt Lake-Los Angeles Wagon Road. It joined the Mojave Road at Forks in the Road (Yermo).

Until 1848, the bulk of activity along the Old Spanish Trail consisted of the official caravans between Santa Fe and Los Angeles. Each fall, Mexican traders packed woolen goods, especially blankets and other manufactured items, to exchange for horses. Then, the next spring the traders would herd the horses and mules to New Mexico. The large herds desiccated the landscape along the trail. John Charles Fremont, in his 1844 travels across the Mojave Trail, noted the destruction caused by the horse and mule caravans: "...the annual Santa Fe caravans, which luckily for us had not made their yearly passage. A drove of several thousand horses and mules would entirely have swept away the scanty grass at the watering place..." (Hafen, 1954: 288).

Captain Fremont traveled much of the Mojave/Spanish Trail in 1844. Heading east from the coast, he followed the trail from Oak Creek to a site near Oro Grande and downstream below Forks in the Road. Some of his narrative has interesting descriptions of the Mojave River, which he appropriately named the "Inconstant River".

A clear, bold stream, 60 feet wide and several feet deep, had a strange appearance running between perfectly naked banks of sand. The eye, however, is somewhat relieved by willows, and the beautiful green of the sweet cottonwoods with which it is well wooded, as we follow along its course, the river, instead of growing constantly larger, gradually dwindles away, as it was absorbed by the sand (Hafen 1954: 287-8).

With the end of the Mexican War in 1847, Americans began to establish homes in California. Emigrants and survey crews appeared in the Western Mojave, and soon military camps, trading posts, and settlements were underway. In 1851, the short-lived Chorpennin mail service carried mail between San Francisco and Salt Lake via Los Angeles and the Mormon Road, which followed the Mojave River through the study area. Among the first Anglos to arrive in the study area were surveyors for the railroad. The 1850's was a decade of great controversy. Following the 1849 Gold Rush, the population of California grew rapidly and there was increasing demand for a railroad to connect with the East. In 1853, Congress authorized a series of railroad surveys along various proposed routes. The 35th Parallel route, aligning Los Angeles with Albuquerque, stimulated a number of surveys along the route through the Western Mojave.

The first railroad explorer of the Mojave Desert was a civilian trader, Francois X. Aubry. After driving a flock of sheep to California in 1852-3 along the Yuma Trail, Aubry returned to New Mexico along the 35th Parallel route. While the exact route of Aubry is not known, he is sure to have entered the Western Mojave and followed the Mojave River for several days. In 1854, Aubry made another round-trip, passing through the Western Mojave again that summer (Chaput, 1975: 110-124). Between Aubry's visits to the area, the Western Mojave was explored by two army engineers. Lieutenant Robert S. Williamson followed the Mojave River to its sink, and at last

discredited the notion that the Mojave River fed into the Colorado. Lieutenant Amiel W. Whipple led a large party along the Mojave Trail (King and Casebier 1976: 290).

Numerous other surveys were undertaken, directed by the State of California. The United States Government laid out township grids in the Western Mojave. Few of these surveys have added lasting knowledge of the area, since in many cases stakes and markers could not again be relocated (Edwards 1959). While the interest in a railroad continued, attention was focused also on wagon roads and postal routes. There was no good stage route to the east, and mail was still being sent around Cape Horn (Chaput 1975: 15).

From 1857 to 1861, survey and road improvement work along the Mojave Trail was conducted by Edward Fitzgerald Beales. Although Beales' instructions did not include work in California, Beales' men improved the trails. This work was sensationalized by his use of camels as pack animals (King and Casebier 1976: 291-2). Beales' work on the 35th Parallel attracted nationwide attention. By 1858, emigrant wagon trains were using his road, and a second mail service commenced October 1, 1858. The growing optimism and increased use of the road soon evaporated with an Indian attack on a wagon train (Casebier 1975). Resulting punitive action against the Indians resulted in the establishment of military outposts in the Western Mojave.

In April, 1859, Major William Hoffnman led a large military party to the needles of the Colorado River, near the site of the *Mojave* villages. Here, with a show of strength, he established a military post named "Fort Mojave". The establishment of Fort Mojave created a need for the shipment of supplies across the Desert and increased military action along the Mojave Road (Casebier 1975: 77-94). During April, 1859, Captain James H. Carleton was sent to punish Paiutes presumed guilty of depredations along the Mojave Trail. He established a base camp about ten miles east of Forks in the Road which he named "Camp Cady". Although the camp was soon abandoned, it was reused occasionally by patrols of the California Volunteers. On April 23, 1865, Camp Cady was regarrisoned, first by volunteers, then by regular army, until 1871 (Casebier 1972: 5-8). On July 29th, 1866, the Camp Cady "incident" occurred. While there is no need to detail the skirmish here (see Casebier's [1972] complete description), the blundering attack on a group of Indians shows the soldiers' fear of the Paiutes, and helps explain why the outpost was garrisoned for a number of years.

As Indian conflicts came to an end, the Western Mojave became a focal point of civilian growth. Immigrants passed through the area along either the Salt Lake Road or the Mojave Road (by then known as the Government Road). Mining developed, attracting people to the area in increasing numbers. Several trading posts were established along the routes of travel, some growing into small settlements. Major suppliers were Lane's (Oro Grande), Grapevine (near Barstow), Lowish Pond (Nebo) and Hawley's in Yermo (Norris and Carrico 1978:38).

While the big mining booms in the region did not occur until the 1880s, lesser strikes took place between 1865 and 1875 near Stoddard Wells (Helendale), the Picacho and Oro Grande areas, and near present-day Twentynine Palms (Norris and Carrico, 1978:44). The Ivanpah boom of the 1870s stimulated travel through the region, but

no permanent settlement resulted. It was not until the big discoveries of the 1880's that there was a major influx of people to the Western Mojave. In 1880, the first big silver strike occurred at Waterman, near the present site of Barstow. The Waterman mine was owned by Robert Whitney Waterman and John L. Porter. To process the silver bullion, a mill was set up along the banks of the Mojave River. Around this 10-stamp mill, the Waterman townsite developed. It was characterized by boarding houses, although the town also had a few homes, a store, a post office, an assay office, and a school. In just one year, Waterman became the largest city between San Bernardino and the Colorado River. Between 1880 and 1887, 70,000 tons of ore were extracted, valued at \$1,700,000 (Belden, 1952).

Twenty miles east of Twentynine Palms, the Dale Mining District was established early in the 1880s. Claims were originally filed on the Supply and Virginia Dale mines. Nearby grew up the town of Dale, and a stamp mill was established. In the 1880's, residents moved six miles south to a small valley and established the town of New Dale (Belden, 1954). The Dale Mining District remained in continuous operation until World War I and was sporadically active after that at such mines as the Gold Crown and the Brooklyn. Some limited mining activity is still carried out in the area. Another silver discovery in the Calico Mountains created another overnight boom town of more than 1000 persons. The Silver King Mine proved very productive, and the nearby town of Calico had the rough and ready character of a mining camp, although it did support a weekly newspaper, *Calico Print*, from 1882 to 1887 (Belden, 1952).

There were several other important silver and gold mines in the Western Mojave. The Waterloo Mine, two miles west of Calico, was owned by the Oro Grande Mining Company. Silver was hauled forty miles to the stamp mills at Oro Grande (Zeitelhack and La Barge 1976:96-104). Coolgardie, Copper City and Goldstone communities blossomed near productive placer mines (Payne 1976: 108). Continued growth of desert mining activity was coupled with the arrival of the long awaited railroads. Not only were lines opened connecting with the east, but small feeder railroads were built, allowing more efficient hauling of ore. Railroads also stimulated several new towns at stations along the line. In 1882, the Atchison, Topeka, and Santa Fe Railroad began laying track eastward from Mojave toward Needles. It became most active after 1885, when the Waterman Junction (Barstow) to Los Angeles track was completed. In 1903, construction of a railroad line began from Daggett along the new San Pedro, Los Angeles and Salt Lake railroad route. This line became known as the Union Pacific in 1921 (Myrick, 1963: 623-647, 765-766).

The Western Mojave continued to develop. Homesteaders moved to the lower Mojave River Valley; dry farming was undertaken in Lucerne Valley and Apple Valley, and new mining and quarrying activities began. After the turn of the century, gold mining was concentrated at the continually active Dale mines, the Orange Blossom Mine (which had a short career in 1907), and the Bagdad Chase mines near which the town of Stedman was established. The Goldstone-Goldbridge area boomed again in the early 1920's (Norris and Carrico 1978: 60-62). These mines were now corporate operations. Borax, an important product of the Northeastern Mojave Desert, also became a commercial commodity in the Western Mojave at Marion. The Pacific Coast Borax Company built a crushing and drying plant for ore extracted from the

eastern Calico Mountains (Zeitelhack and La Barge 1976: 100-101). The cement industry developed into a major activity within the Western Mojave. The Golden State Portland Cement Company was situated in Oro Grande and remains today under the name of the Riverside Cement Company. The Southwest Portland Cement Company established a plant at Leon, along the Mojave River, and spawned the town of Victorville one mile to the south (Myrick, 1963:857-858).

Corporate mining and quarrying led to construction of a number of small railroad lines for the more efficient hauling of ore. Some examples are the Bagdad - Chase railroad spur, the Mojave Northern railroad, and the Pacific Coast Borax line which ran between the crushing and drying plant at Marion (between Calico and Daggett) and the colemanite beds in the Calico Mountains (Zeitelhack and La Barge 1976: 100-101). While most of these railroad lines were used only for industrial purposes, the Northern Mojave Railroad provided passenger service from 1915 to 1925 (Myrick, 1963:861). Other small railroad lines in the study area include the San Bernardino Mountain Railroad which runs from Victor Valley eastward. The Adelanto Spur runs northwest from Leon, and now serves George Air Force Base. In 1955, the Permanente Cement Company developed the Lucerne Valley Branch of the Santa Fe between Hesperia and Cushenberry (Myrick, 1963: 864-865).

The arrival of the railroad altered wagon travel routes. Major roads crossing the desert became aligned with the railroad tracks, since a supply of water was available at railroad maintenance and way stations (an account of routes in the California Desert, 1776-1880 is discussed in Warren and Roske 1978). In the first two decades of the 20th century, many automobile routes were established within the Western Mojave. Many are detailed in U.S. Geological Survey Water-Supply Papers #224 and #490-B (Mendenhall 1909; Thompson 1921). Beginning in the 1920s, the Western Mojave was traversed by car travelers who now sought recreation. Victorville and Twentynine Palms were two resort areas which attracted vacationers. Victorville maintained an image of a real "Western Town," featuring guest ranches, saloons, and rodeos (Norris and Carrico 1978: 78-79). The Desert became more accessible in the 1930s when two major east-west highways were paved, Route 66 (supplanted by Interstate 40) and U.S. 91 (paralleling Interstate 15).

During World War II, the military took control of much of the California Desert. While General Patton's Desert Training Program was concentrated further east, several military bases were established within the Western Mojave. In 1940, a large tract of land northeast of Barstow was set aside for Camp Irwin. Near Twentynine Palms, a glider training base was set up in 1941. Both of these sites were also utilized as armored division training areas. Army Air bases were created near Daggett and Victorville. Supply depots at Nebo and Yermo were taken over by the Marine Corps after World War II (Norris and Carrico, 1978: 97-99). At the time of the Korean War in the early 1950s, military bases were reactivated.

In 1952, a large Marine Corps Training Center was established at Twentynine Palms. These bases continue to operate (Norris and Carrico, 1978: 116).

Since World War II, the Western Mojave has been experiencing a boom in urban growth. Much of this expansion centers around Victorville, Hesperia and Apple Valley, and near Twentynine Palms and Yucca Valley. Along with an increased number of year-round occupants, and persons with weekend homes, there is an ever growing number of visitors to natural areas such as Joshua Tree National Park was established as a National Monument in 1936. Off-road vehicle users, rockhounds and relic hunters have significantly stepped up their activities in the area. Accessibility to the region was made easier by the establishment of an interstate freeway system. The interstate highways have caused considerable alteration of traffic routes, often leading to the closing of service-oriented towns along the older roads. At the same time, the high desert has become a destination for weekend travelers from the Los Angeles metropolitan area.

History of Barstow

The history of Barstow is well documented in the works of Moon (1980), Berkman (1988), Rittenhouse (1989), Keeling (ed. 1994), Swisher (1995), Thompson and Thompson (1995), and Walker (ed.1995)

ARCHAEOLOGY

The Planning Area is part of a region which exhibits a long history of occupation by man. There have been a number of chronological proposals to characterize human habitation of the Mojave Desert, although none has been established that applies specifically to the Western Mojave, nor one that covers all temporal periods of occupation. Therefore, for the purpose of this report, the chronologies of Wallace (1962) and Bettinger and Taylor (1974) as summarized by Rogers, 1966; E.L. Davis, 1978; Coombs, 1979; Greenwood and McIntyre, 1979; Qillen, 1979; and, Stickel and Weinman-Roberts, 1980, will be used.

Although the first humans are hypothesized to have appeared in the New World as far back as 70,000 years ago, most archaeologists agree that man was present by 13,000 years ago. A number of sites exist with unquestioned radiocarbon dates by this time period. These sites also exhibit a well-developed tool assemblage which includes projectile points.

The Early Systems or Late Pleistocene Period (70,000 to 10,000 years ago) began in the late Pleistocene when deglaciation, for the most part, halted. After that time, drier climatic conditions set in for the Mojave Desert region. More attention has been paid to the Late Pleistocene than to any other period represented in the Western Mojave. Due to continuing controversies over interpretations of materials from sites at Calico, Coyote Gulch and Manix Basin, the period must still be considered highly problematic.

Cultural materials alleged to be from the later part of this period (40,000 to 20,000 years ago) have been named collectively, the Manix Lake Lithic Industry. Other terms such as "Malpais," coined by M. Rogers (1939), refers to the pre-projectile point industries found throughout the California Desert. The artifact assemblage consists

primarily of large bifaces or blanks, choppers, cores and flakes. The pattern of flaking exhibits numerous step fractures and deep bulbs of percussion, indicating a crude Chard-hammer technique of manufacture. Most of the sites occur on desert pavement and could have been deposited any time after the formation of the pavement. The lack of points and the simple technology argue for an early date, yet the materials could merely represent the refuse from lithic workshops.

Period I: (10,000 to 5,000 B.C.) has also been variously referred to as "Lake Mojave," "San Dieguito," "Haskomat," "Fallon Phase," "Western Lithic Co-tradition," and "Western Pluvial Lakes Tradition." Among these terms, "San Dieguito," and "Haskomat," present a well-defined interpretation of the lithic assemblages and general economy of the early inhabitants of the Western Mojave.

Generally speaking, this period is characterized as a generalized hunting tradition that was widespread in the California Desert and in the Western Great Basin. The sites are generally found in association with river and lakeshore environments, and inhabitants enjoyed a cooler and moister climate than is found in the Mojave today. The lithic assemblage for the San Dieguito Complex includes leaf-shaped or ovate projectile points, knives, graving tools, domed scrapers, and crescents. The manufacturing technique is crude, producing irregular edges and some deep bulbs of percussion. However, tool types and manufacturing techniques for the Haskomat Complex reflect more refined thinning and pressure flaking. The characteristic point type consists of long sloping shoulders and a long, parallel-sided stem. Other artifacts include a number of unusually shaped scrapers as well as spoke shaves, graters and crescents.

Period II: (5,000 to 2,000 B.C.) represents one of the poorest known periods in Mojave Desert chronology. The problems come from the sites representing this period; the point types used as time markers; and the environment and related economic factors shaping this period. Wallace (1962) observed an apparent gap in the archaeological record after his initial Lake Mojave Period (5,000 to 3,000 B.C.). He suggested that it was caused by a spell of hot and dry conditions which precipitated a prolonged drought, and is referred to as the Altithermal, and ultimately resulted in the Mojave being virtually abandoned by the early human populations. However, other researchers (Hall and Barker, 1975; Bettinger and Taylor, 1974) do not concur.

Whatever the disagreements as to the cause and effect of changes which shaped regional settlement-subsistence patterns, two type sites were identified: the Pinto Basin site (Campbell et al., 1937) and the Stahl Site (Harrington, 1957). Point types include the *Silver Lake series*, the *Humboldt series*, and the *Pinto series*. All three types have been reported in the Mojave and at various locations in the Great Basin.

Period III: (2,000 B.C. to A.D. 500) contains a number of well-defined point types including the *Elko series*, *Gypsum Cave* and *Humboldt Concave Base*. Some of these have been used successfully as fairly precise time markers in the Great Basin and the Mojave Desert. The Period has also been referred to as "Amargosa I," "Newberry Period," and, the "Early and Middle Rose Springs Phases." The size of the points has been a critical factor in the interpretation of the period, in that they all show a

marked trend toward a medium-to-large size with a variety of notching and stem types. At Newberry Cave, these points have been found in association with dart shafts linking their use to the pre-bow and arrow period of the atlatl (a spear-throwing device).

An increase in the number of grinding implements found during this period suggest an increased reliance on plant processing as a supplement to a hunting economy. Toward the end of this period, the discovery of split twig figurines and pottery indicates the beginning of a slow westward diffusion of Southwestern traits into the Mojave. In addition, there is also evidence for the introduction of the bow and arrow. Small point types of the same general form begin to replace the larger dart point types.

Period IV: (A.D. 500 to A.D. 1,000) is essentially an extension of Period III. However, there is an addition of smaller points brought about by the introduction of the bow and arrow. The most common point types are the *Middle* and *Late Rose Springs series*. The Cottonwood point appears by the end of Period IV. There are indications that some locations in the Mojave were being used by the *Anasazi* as part of a trade route to the Pacific, as well as for the exploitation of region's turquoise resources. Most of this activity was carried out in the eastern portions of the Mojave near Halloran Springs, with additional mining taking place along the Mojave River, west of Barstow. Furthermore, *Anasazi* and *Yuman* influence is represented by characteristic ceramics as far west as Afton Canyon.

Period V: (A.D. 1,000 to Ethnographic Present) witnessed the abandonment of the permanent *Anasazi* settlements in the southern parts of Nevada and Utah at the beginning of this period. This ended their influence in the Mojave. During this Period, there is a noticeable change in point types, as the *Cottonwood series* and the small *Desert Side Notched series* become the predominant point types. These points are generally associated with the *Numic* expansion throughout much of California and the Great Basin. A few occurrences of Colorado River pottery in the Western Mojave, attest to influences from the *Hakataya* groups (*Hakataya* is a term used to designate prehistoric Lower Colorado River groups that may be called *Yuman* or *Patayan*). From ethnographic accounts, there is evidence of other movements of these Colorado River peoples.

RECORDS SEARCH RESULTS

This project was conducted as part of a comprehensive General Plan study for the City of Barstow's Cultural Resource Element. In general, this project is referred to as an Inventory Cultural Resource Overview Study designed to:

- Compile extant cultural resource data including bibliographic references for the prehistoric, ethnographic, ethnohistoric and historic sections encompassed within the Planning Area.
- Consult available unpublished and published literature pertinent to cultural resources in the study area including site information, manuscripts, documents,

reports, monographs, books, technical studies, historical maps, archival information and museums.

- Consult with professional, para-professional and avocational archaeologists, the Bureau of Land Management, Native Americans, professional and amateur historians, local and regional historical societies, and other persons knowledgeable about the Planning Area.
- Conduct a preliminary physical overview of the study area to become familiar with the important area features.
- Assemble a comprehensive overview of the cultural resources and human use of the Planning Area from its initial occupation to the present with currently existing documentary evidence. This overview will be accompanied by relevant graphics, photographs, tables, figure, maps and other support material deemed appropriate.
- Generate sensitivity maps for the City of Barstow which will illustrate cultural resources by planning unit, type and nature of sensitivity fort use in present and future planning phases, as well as to assist and direct planners, developers and cultural resource personnel in achieving compliance with cultural resource legislative enactments while completing the planning process.
- Provide a cultural resource management summary which will briefly summarize the conduct and results of the cultural resources program while providing recommendations for cultural resource preservation and protection.

SUMMARY OF PRIOR RESEARCH

Prior to the mid-1970s, archaeological interest in the Western Mojave was highly selective in terms of research focus, which concentrated on specific sites rather than providing a regional research strategy. Over the years, research has ranged from surveys and petroglyph recordation, to sporadic excavations, and a variety of cultural resource management studies (Coombs, 1979:14-15; Stickel and Weinman-Roberts, 1980:24). Pleistocene lake sites, rockshelters and the Mojave drainage have taken precedent over broader research areas such as the Lucerne or Morongo Valleys. Additionally, research has tended to be unsystematic in terms of methodology and objectives. Essentially, many areas were ignored at the expense of others without the implementation of a broad-based, unifying research goal.

Research within the Western Mojave, began in the 1930s with work performed by Malcolm Rogers (1929, 1939) and William and Elizabeth Crozier Campbell (1935, 1937, 1940). Newberry Cave was among the first excavations conducted in the Western Mojave (Smith, et al., 1957; Mosely and Smith, 1962; Smith, 1955 and 1963) resulting in the discovery of evidence suggesting human occupation in the cave as early as 2000 B.C. Schuiling Cave was excavated around the same time as Newberry Cave (Smith, 1955). Other Pleistocene studies preceding those at Calico were undertaken at Coyote Gulch (Simpson, 1961) and Manix Basin (Simpson, 1964).

For the most part, early work in the region was of a survey nature, rather than purely excavations. In the early 1960s, research was carried out under the auspices of the San Bernardino County Museum, the Archaeological Survey Association, and the UCLA Archaeological Survey, and included a survey of the Mojave River and adjacent regions carried out by Gerald Smith (1963). This was followed by a survey of the Harper Lake area by Herrick Hanks (1968), Cinnamon Roll Hills (T. King 1972), Lucerne Valley (Mortland, 1974); Victorville Narrows (Simpson, 1976); the famous Calico excavations, initiated in 1974 and continued by Ruth Simpson, L.S.B. Leakey, T. Clements, the San Bernardino County Museum, and the Bureau of Land Management (Kaldenberg, 1978); Superior Valley (Quillen, 1979); Stoddard Valley (Sutton, 1980); an Evaluation of Early Human Activities and Remains in the California Desert (E.L. Davis, K Brown and J. Nichols (1980); Fort Erwin (E.L. Davis, Eckhartt and Hatley, 1981); and Mojave River Forks Reservoir (Altschul, Rose, and Lerch, 1985). In addition, several major transmission line studies have been performed which provide additional relevant background and contextual data (although this by no means represents an exhaustive source), and include: Brooks, et al. (1975); Fowler et al. (1978); and, Greenwood and McIntyre (1979).

The 1970s witnessed the involvement of the Bureau of Land Management (BLM) which implemented a comprehensive plan to inventory and assess the cultural resources in the California Desert. The BLM sponsored a continuing series of cultural resource reports which served as important documents in the education and management of cultural resources in the California Desert. Between 1969-1972, Roger Desautels conducted a survey of the Mojave Desert for the BLM, providing a collection of survey records for several counties including 179 sites in San Bernardino County. Primarily intended as a literature search and research phase, Desautels compiled several volumes of notes and catalogued artifacts from 34 sites he visited and surface collected from. In 1973, Margaret Weide prepared the *Archaeological Inventory of the California Desert, A Proposed Methodology*; this was followed in succession by Margaret Weide and James Barker (1974) *Background to Prehistory of the Yuma Desert Region*; Matthew Hall and James Barker (1975) *Background to Prehistory of the El Paso/Red Mountain Desert Region*; Chester King and Dennis Casebier (1976, 1979) *Background to History and Prehistoric Resources of the East Mojave Desert Region*, and *The Archaeology of the Northeast Mojave Desert*; Coombs, et al. (1979) *The Archaeology of the Western Mojave*; Stickel and Weinman-Roberts (1980) *An Overview of the Cultural Resources of the Western Mojave Desert*; and *Cultural Resources of the California Desert. 1776-1980: Historic Trails and Wagon Roads*, edited by Russell Kaldenberg (1981).

The mid-1980s to the present has, and continues to, produce hundreds of cultural resource management and contract archaeological studies which are on file at the Archaeological Information Center at the San Bernardino County Museum. According to Stickel and Weinman-Roberts (1980:248), there have been all too few interpretative studies of the various cultures which sequentially developed over time in this part of the Mojave Desert. The consensus seems to be that from the earliest times, right up to contact, the area was occupied by successive populations of bands of hunter/gatherers. These bands each probably consisted of 25 persons on the average. An accurate picture of their adaptive strategies for surviving in an

environment which, although it fluctuated, nevertheless continued to worsen by the end of the Pleistocene, has not been established. Past archaeological research has been mainly directed to answer questions of culture history (geographical extent, relative age, and defining artifacts and course of development of cultures in the region).

Recent archaeological research has been implemented in the form of planning units, where research is concerned with culture process and the general factors which cause cultural variability and change. Cultural resources take on special values to scientific archaeologists interested in testing models and hypotheses relative to defining the culture processes operative in a given area. Potential research topics attempt to explain environmental change coupled with cultural change; human population changes; changes in material culture; changes in techno-economics; changes in social organization; changes in ideology and psychology; and changes in communication systems over time. Special anthropological value can be placed on such research for the Mojave Desert.

More specifically, lithic resources near the Mojave River could address major research concerns regarding settlement along the Mojave River. Several research questions might focus on: the discrimination of lithic workshops from habitation areas; better defining of the relationships between quarries, workshops and other ancillary lithic related activity areas and habitation areas such as villages; defining specific attributes of local and regional lithic technologies, such as sourcing specific materials; defining the sequence of mining and quarrying technology, and possible shifts in mining and quarrying strategies and activities, where the acquisition and exploitation of locally available lithic resources may have changed over time; and, providing comparative petrological analysis of quarry materials and lithic materials from other sites adjacent or nearby, which could provide data on trade networks or travel of local groups to obtain specific source materials (Davis, et al., 1976; Fowler, et al., 1978; and Greenwood and McIntyre, 1979:63-66).

Finally, according to Wilke and Schroth (1989:146), the acquisition of tool stone by aboriginal peoples was an industry that, in terms of scale, varied greatly from one situation to another. However, the metric tons of tool stone that must have been taken from various major quarries over time, suggest formalized acquisition, reduction, and distribution of stone, perhaps in some cases by specialists, throughout much of prehistory. The physical and chemical tracing of stone from such sources to elucidate patterns of prehistoric exchange, is a major research effort in archaeology.

A records search was performed by the Archaeological Information Center, San Bernardino County Museum, in April and May of 1996 identifying the presence of all previously recorded and/or listed archaeological and historic resources within the Planning Area. The results indicate that no pending pre-historic or historic archaeological sites, or prehistoric or historic isolates exist within the APE-direct. However, one prehistoric isolate; two historic archaeological sites; three possible historic archaeological site locations determined from historic maps; and, one National Register - Eligible Property were recorded within 800 meters (one-half mile) of the APE - direct.

Based on a review of the resources for the region, a typology for prehistoric site types was developed by McGuire & Glover (1991:9), which reflect the cultural resource data base encompassing the project area as follows:

- *Segregated Reduction Loci* represent single episodes of cobble testing or reduction of from one to three cobble masses. These sites are spatially restricted, range in size from 1-157 square meters (1.15-218 square yards) and the materials present are locally available (21% of the sites fit into this category).
- *Minimal Flaked Stone Scatters* differ little from the segregated reduction loci except that the flaked stone is more variable in material types and in reduction profile, indicating a somewhat greater breadth of activity. They are extremely ephemeral, and range in size from 35-6,000 square meters (40-7,000 square yards), with the modified flake inventories not exceeding twenty specimens. Most scatters of this type do not contain tools (15% of the sites fit into this category).
- *Small Feature Areas* represent isolated rock clusters with an associated artifact. There is no flaked stone material associated with the feature (2% of the sites fit into this category).
- *Cobble Testing/Quarry Areas* are not unlike the segregated reduction loci previously described. However, cobble testing and primary reduction activities occur without somewhat greater intensity over potentially longer periods of time, resulting in sizable accumulations of debris. These sites are situated on surfaces containing lithic raw materials suitable for the manufacture of flaked stone implements. As such, cobble test/quarry sites can extend over large tracts of land (usually desert pavements containing suitable cryptocrystalline, quartz, or metavolcanics). Some regional variation is apparent, primarily reflecting the nature and extent of the raw materials.
- *Flaking Debris* is characterized by some combination of fractured cobbles and shatter, large primary reduction flakes (many with cortex), and smaller amounts of large interior thinning flakes. In some cases this material is found at a very low density throughout the site, while in others, the material occurs in a series of discrete concentrations suggestive of segregated reduction episodes. Sites of this type generally lack datable artifacts or materials. Tools, if present at all, are usually limited to crudely fashioned cores or bifaces, cobble tools, and the occasional hammerstones (35% of the sites fit into this category).
- *Flaked Stone Scatters* range in size from 100-15,000 square meters (115-17,400 square yards). They exhibit both primary and secondary reduction debris and differ from the cobble test/quarries in their lack of fractured cobbles and shatter. Initially reduced and/or tested materials appear to have been transported to these sites for subsequent reduction, and the tool assemblage is generally limited (23% of the sites fit into this category).

- *Complex Multi-Tool/Feature Sites* are relatively heterogeneous manifestations of features or artifact assemblages indicative of some level of habitation. These multi-tool/feature sites are identified by a surface flaked stone scatter associated with features and/or other major classes of tools (e.g., milling-slabs, handstones). Flaked stone debitage is generally represented by secondary reduction debris, often of variable materials (4% of the sites fit into this category).

A number of archaeological studies have been performed within 1,609 meters (5,280 feet) of the APE-direct, including: Hearn and Simpson (1976b); Sutton (1980); Hammond (1987); Clay and Hause (1990); McGuire (1990); Brock (1991); and, McGuire and Glover (1991). These studies indicate that the majority of previously recorded cultural resources within a three kilometer radius (two miles) of Barstow are related to lithic extraction and procurement, reduction and manufacturing activities.

Several quarry areas have been identified within 1,609 meters (5,280 feet) of the project based on information obtained from the Archaeological Information Center, San Bernardino County Museum (Robin Laska, 1993, pers. comm.), and McGuire and Glover (1991), and is summarized as follows: CA-SBr-562/563 represents a large crypto-crystalline cobble test/quarry area with tools and groundstone material; CA-SBr-717 represents a large opal, jasper and chalcedony quarry area; CA-SBr-2291 represents a large rhyolite lithic re-reduction/quarry area made up of two segregated loci and containing flakes, cores and tools; CA-SBr-3493 represents a large lithic scatter/quarry area containing chalcedony and rhyolite flakes, cores, tools, a grinding surface and side-notched point; CA-SBr-3677 represents a large jasper and chalcedony quarry/reduction area; CA-SBr-4037 represents a large cryptocrystalline cobble test/quarry area made up of four segregated reduction loci within a larger diffuse desert pavement quarry; CA-SBr-4055 represents a large cryptocrystalline cobble test/quarry area made up of one segregated reduction locus within a larger diffuse desert pavement quarry; and, CA-SBr-6950 represents a moderate-sized cobble test/ quarry made up entirely of cryptocrystalline flakes, cores, and shatter. No formal tools were noted.

Recent work by Sally Cunkelman and John Murray of the Bureau of Land Management in 1992 (Robin Laska, 1993, pers. comm.) identified approximately 57 new sites in the hills southwest of the Lenwood/I-15 Interchange. These resources include: 42 lithic reduction sites (74% of the newly recorded sites); 11 lithic scatters (19% of the newly recorded sites); and the remaining four sites including two trails, one food processing site, and one lithic quarry. This conforms almost exactly with McGuire and Glover's field results, where similar site types account for 94% of their total inventory.

Based on research results, recorded sites for the general area conclusively indicate that the primary use of this area was for the procurement, acquisition and reduction of locally available lithic resources. The most prevalent types of exploited materials found in the quarry areas and in site contexts include the general category of cryptocrystallines, chalcedony, jasper, chert, and rhyolite.

These sites have value for the various research programs which deal with prehistoric exchange systems and techno-economics as they are manifested in regional trade patterns, raw material extraction processes, intra-site variability (activity areas), wear pattern analysis for lithic tool types, and chronological placement of sites by the lithic reduction technology (Semenov, 1964; Frison, 1968; Wilmsen, 1968; Nance, 1970; Tixier, 1974; J.O. Davis, et al., 1976; Ericson, 1978; Fowler et al., 1978; Hayden, 1979; and, Wilke and Schroth, 1989).

CULTURAL RESOURCE MANAGEMENT PROCEDURES AND GUIDELINES

PURPOSE

For all planning staff involved in the processing of discretionary projects, the Cultural Resource Management Policies Procedures and Guidelines (CRM-PPG) manual is designed to provide a clear, concise and thorough approach to addressing proposed adverse impacts to cultural resources within the parameters of the California Environmental Quality Act (CEQA) and appropriate Federal laws. A determination of eligibility is made to ensure the protection and proper management of sites, places, or objects as mandated by the National Historic Preservation Act (NHPA) of 1966, as amended; the National Environmental Policy Act (NEPA) of 1969, as amended; and Executive Order 11593 of 1971, and documented within the context of 36 CFR 800. The key concept within the National Register as well as CEQA, is significance. CEQA guidelines were designed by the State as a means of applying effects to historic and archaeological properties, and has as its foundation NRHP criteria.

Impacts to cultural resources are identified by comparing plans for land alteration with the location of individual resources. The extent of the impact can be measured by the amount of scientific information which will be lost upon implementation of the project. Direct impacts destroy the information that is present within a cultural resource(s) through the removal of the material remains which contribute to the integrity of the site (location, design, setting, materials, workmanship, feeling, and association). Indirect impacts tend to affect a resource(s) by significantly enhancing the possibility of destruction through increased access or awareness, usually resulting in vandalism. Therefore, alleviating potentially adverse impacts to cultural resources through mitigation measures is the basis for cultural resource management recommendations.

DEFINITIONS

For a listing of the definitions of terms used in this subsection, please refer to pages IV.2.11-13.

Phase 1 Archaeological Study

This study is the first step in the planning process to identify potentially significant heritage remains within a project area. The study should encompass the performance of a formal records search; a surface reconnaissance of the entire project area; and report detailing the results of the archaeological study. The report should conform to the Preservation Planning Bulletin Number 4(a), Archaeological Resource Management Reports (ARMR): Recommended Contents and Format, prepared by the California Office of Historic Preservation (OHP) in 1989. Minimally, the report should contain a preface, acknowledgments, statement of confidentiality if resources are encountered, table of contents, cover letter, title page, management abstract/summary, description of the scope of work and project description,

environmental setting, cultural and historical overview, research design, methodology, findings, discussion/interpretation, management considerations, references, appendices, and references.

Phase 2 Archaeological Study

This is a detailed assessment of heritage resource(s) encountered during a Phase 1 Archaeological Study. A scope of work and research design must be approved prior to the initiation of the field work. Native American involvement must be secured and documented, and a report must include the results of all data obtained during the study in a format similar to the one discussed in the Phase 1 Study. The primary intent of this study is to address the significance of the resource(s) based on CEQA or Section 106 criteria.

The results of this study will directly affect the next phase of planning. Either mitigation through avoidance and preservation, or additional work will be recommended. If the heritage resource is determined not to be significant, then it will be up to the planner to ensure that the level of work performed conformed to the scope of work and was sufficient to ensure the quality and quantity of data necessary to make a determination of "non-significance". In extreme cases, if this finding is questionable, or concerns are raised by other scientists over the results, an outside consulting source with local expertise should be consulted for a second opinion.

Phase 3 Archaeological Study

This study is a focused program aimed at data recovery for a significant heritage resource(s) assessed during a Phase 2 Archaeological Study, or identified at some point during the planning process as being significant. A Phase 3 Archaeological study must be directed by a pre-approved scope of work, and provide a detailed report which expands on the information obtained during the Phase 2 Archaeological Study. Additionally, Native American involvement must be documented.

The results of this study shall be presented in a final document which synthesizes all extant data likely to be retrieved from the resource(s). If a likelihood for encountering burials and or features is sufficiently justified by the archaeologist and supported by the case planner, then monitoring may be required to ensure that buried resources, if encountered during excavation, are identified, recorded and studied. If burials are encountered, work must stop and the coroner notified immediately.

PLANNING PROCEDURES: THE PERMIT/CASE PROCESS FOR ALL PROJECTS

The following guidelines shall serve the City of Barstow as a proactive planning tool aimed at preserving and protecting the heritage resources within its Planning Area as well as complying with applicable laws and policies as they pertain to the resource base. Planners should use these guidelines as a general process format to appropriately deal with the heritage resources as they are affected by the permitting and planning process.

A part-time or on-call archaeological staff position authorized to assist the City of Barstow Planning Department in administering all phases of cultural resource management would greatly facilitate the standardization of implementation of guidelines, policies and legalities with regard to heritage resources; aid in reviewing and responding to public and scientific concerns; ensure the adequacy of each phase of archaeological work; and control the costs associated with all planning review phases.

Step One: Preliminary Project Evaluation

Step one shall include all actions by the case planner prior to the first new case meeting. An initial evaluation of the project area in relation to potential cultural resources shall be prepared by the case planner. This may involve a physical inspection of the project by the case planner to see the nature and extent of any prior impacts as well as provide familiarity with the location, and shall in all cases involve consulting existing sensitivity maps on file in the planning department (whether on computer or in map file); a review of any existing files or documents pertinent to the project involving cultural resources; and the performance of a quick check to ensure the an accurate determination as to which type of cultural resource review will be required.

All non-exempt projects shall require a Phase 1 Archaeological Study, except where a prior cultural resource investigation has been performed, or where adequate information has been obtained from the Archaeological Information Center to confirm that no additional work is warranted within the project area. However, there are some instances where the cultural resource sensitivity of the area is such that the field phase conclusions cannot completely rule out the potential for buried cultural resource remains. In such cases, a condition for on-site monitoring may be authorized during earthmoving, construction or development activities within a specified area on the project area until a certain depth has been obtained. This condition may be recommended during the cultural resource management process.

All projects with a potential for direct impact (whether they are exempt or not) and located within 50 meters (150 feet) of a known heritage resource, should be assessed for potential impacts according to the procedures outlined below. CEQA requires that impacts to all significant cultural resources be properly mitigated. However, not all projects face potential impacts and many projects are not subject to CEQA review, therefore, these exempt projects are not normally subjected to a cultural resource assessment.

Such exempt projects are further defined by the City of Barstow Planning Department. Some exempt projects include: categorical exemptions; single-family dwellings and second unit dwellings; specified minor developments and agricultural developments; minor projects involving grading or earth disturbance activities and not affecting more than half an acre; other projects, on a case-by-case basis, which do not appear to have the potential for any direct or indirect impact to cultural

resources (mergers, and lot line adjustments, etc.); and non-discretionary entitlement requests, except those which explicitly require cultural resource studies.

A case waiver may occur during the initial evaluation process when it is determined that the project will have no adverse impact on significant cultural resources, resulting in no further archaeological review for the project. Projects to be considered for a waiver shall include, but shall not be limited to: projects proposed on previously disturbed ground or fill material; steep slopes; and, where previous, adequate archaeological studies have been conducted and no cultural resources were discovered.

The case planner shall review all extant information, including the results of the quick check, prior to making a preliminary case determination with regard to cultural resource concerns. If the proposed has never undergone a systematic archaeological reconnaissance, or if pertinent information is lacking in order to make an accurate determination regarding the nature and extent of prior cultural resource information, then recommendations for the completion of a Phase 1 Archaeological Study shall be made. At this time, the client shall be provided a list of qualified archaeologists to complete the task.

A Phase 1 Archaeological Study shall begin with a thorough records search obtained by the archaeologist from the appropriate Archaeological Information Center. Additionally, a reply form and USGS topographic quadrangle delineating the project area, shall be forwarded to the appropriate Native American group(s) from a list provided by the City of Barstow, in order to notify them of the impending project and, hopefully, obtain a response as to their specific concerns or recommendations, which are to be included within the context of the report (see definition for Phase 1 study).

The cost of preparing all cultural resource reviews required pursuant to this project phase, as well as the review of the appropriate studies by the planning staff, shall be paid for by the project applicant.

Step Two: Cultural Resource Assessment

Step two shall include all actions by the case planner after the results of the Phase 1 Archaeological Study have been completed by the archaeologist and delivered to the case planner. If no cultural resources were located during the Phase 1 Study, either through the research or on-foot reconnaissance phases, then this aspect of the project is complete with regard to further cultural resource concerns. If cultural resources were encountered during the Phase 1 Archaeological Study, then the potential impacts to the resource(s), both direct and indirect, must be addressed by comparing the proposed development plans against the location(s) of the cultural resource(s).

If a direct impact will occur to the resource(s) by the implementation of the project, then the management options presented by the archaeologist within the context of the Phase 1 Archaeological Study should be followed. In-situ preservation of a site is always the preferred manner of avoiding damage to archaeological resources.

Preserving the site is more important than preserving the artifacts alone because the relationship of the artifacts to each other in the site provides valuable information that can be lost if the artifacts are removed. Further, preserving the site keeps it available for more sophisticated future research methods. Preservation may also avoid conflict with religious or cultural values of groups associated with the site. According to CEQA, mitigating the loss of archaeological resources which may be impacted by the proposed project can be achieved through a number of alternatives including:

- Avoidance of the area.
- The salvage of data from the resource.
- A combination of both avoidance and salvage.

A redesign of a project to avoid impacts to cultural resources is in most cases, preferable to mitigation through data salvage programs. The California Environmental Quality Act (CEQA), Appendix K, Section II states: Public agencies should seek to avoid damaging effects on an archaeological resource whenever feasible. If avoidance is not feasible, the importance of the site shall be evaluated using the criteria outlined in Section III, as follows:

- In-situ preservation of a site is the preferred manner of avoiding damage to archaeological resources. Preserving the site is more important than preserving the artifacts alone because the relationship of the artifact to each other in the site provides valuable information that can be lost when the artifacts are removed. Further, preserving the site keeps it available for more sophisticated future research methods. Preservation may also avoid conflict with religious or cultural values of groups associated with the site; or
- Avoiding damage may be accomplished by many approaches, including:
 - Planning construction to miss archaeological sites.
 - Planning parks, greenspace, or other open space to incorporate archaeological sites.
 - "Capping" or covering archaeological sites with a layer of soil if: the soils chosen for coverage will not suffer serious compaction; the covering materials are not chemically active; the site is one in which the natural processes of deterioration have been effectively arrested; and, the site has been recorded and the boundaries delineated.
 - Deeding archaeological sites into permanent conservation easements.

In some cases, the boundaries of the cultural resource are unclear. Most often this is the case with regard to prehistoric cultural residue, although historic archaeological resources, where standing remains are no longer visible or only partially visible as in the case of foundations, etc., may also contain significant features which remain buried and undetected. If it is the conclusion of the archaeologist that surface remains do not provide enough information to accurately define the limits of the resource(s),

and the client chooses to avoid the site yet still build within the project area, then further archaeological work shall be warranted.

Additional work designated by certain agencies as a Phase 1.5 Archaeological Study, shall be aimed solely at delineating the exact boundaries of the resource(s) by the most advanced scientific techniques available (within acceptable time and cost parameters) for the express purpose of preserving the resource(s) through avoidance. A report will be presented documenting the results of the study, and it will be the responsibility of the case planner to ensure that the client adheres any restrictions placed on his property preventing further development within the area designated for avoidance, in perpetuity, or until such time as a Phase 2 Archaeological Study is warranted.

If the option of avoidance is not selected by the client, additional archaeological work will be necessary to address the aspect of significance. A Phase 2 Archaeological Study shall be conducted by a qualified archaeologist and a Native American representative selected from the appropriate lists provided by the case planner. The Planning Director shall evaluate and approve any proposal prior to the implementation of a Phase 2 Archaeological Study, including the scope of work and research design. A non-biased, third-party reviewer may be hired to provide input, clarify, or re-scope the archaeological proposal if the Director feels that it may be inadequate or lacking in methodology or approach.

Historic and prehistoric archaeological resources are afforded the same consideration during the planning process with regard to avoidance or determination of significance. Differences in implementing the various studies necessary to avoid through preservation, or to address significance for the purpose of mitigating project impacts through non-avoidance, are based on the type of resource(s) under consideration (standing architecture, historic remains, etc.).

The Evaluation Of Significance

As a means of evaluating a resource(s) potential to yield significant data, a criterion of eligibility has been established from which general research goals can be proposed to address the specifics of a site or feature. These goals are aimed at examining and documenting such broad behavioral patterns as: ethnicity, acculturation and interaction; the organization and utilization of space by individuals or groups; changing land use patterns; the length and duration of occupation; technological advances and contributions; and, specialized activities and occurrences.

In order to address such concerns, background historical research has as its primary objectives the identification and evaluation of the cultural resource base utilizing the following criteria:

- Contextual association which provides the cultural affiliation or its place in time, its relationship to a person or event, or its architectural value.

- Integrity which will address the sense of location, design, setting, materials, workmanship, feeling, or association.
- The level of significance which is based in part on contextual association and resource integrity.

Evaluation of significance under the *California Environmental Quality Act* (CEQA) is based on guidelines established by the National Register of Historic Places (NRHP). The NRHP is an effective planning tool for both long-term and short-term cultural resource management considerations. As a long-term planning tool, it is used to measure the range of impacts to potential NRHP properties. As a short-term planning tool, it defines the level which must be reached within the planning process prior to a cultural resource property being considered eligible for 36 CFR 800 review.

A determination of eligibility is made to ensure the protection and proper management of sites, places, or objects as mandated by the *National Historic Preservation Act* (NHPA) of 1966, as amended; the *National Environmental Policy Act* (NEPA) of 1969, as amended; and *Executive Order 11593 of 1971*, and documented within the context of 36 CFR 800. The key concept within the National Register as well as CEQA, is significance. CEQA guidelines were designed by the State as a means of applying effects to historic and archaeological properties and has as its foundation NRHP criteria. An evaluation of significance in prehistoric and historic sites is usually measured by a number of variables which reflect their applicability to present and future research questions posed by scientists in describing and explaining culture change.

Archaeological materials are extremely fragile and non-renewable; thus, any activity which alters the surface of the land, including archaeological pursuits, can impact these resource remains. Consequently, all cultural resources can be considered significant to some extent because they are finite in number, unique, and non-renewable. However, that cultural resources should be considered significant only because they are finite, is an inadequate justification for managing or mitigating these resources.

This evaluation process requires that a resource, or the information it represents, be related to some framework held in common by all archaeologists, and thus provides a scale or measure of reference for determining the potential significance of similar resources. This framework usually addresses research orientation, and geographic, cultural, and temporal questions within the context of significance.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- That are associated with events that have made a significant contribution to the broad patterns of our history: or

- That are associated with the lives of persons significant in our past; or
- That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- That have yielded, or may be likely to yield information of importance in prehistory or history.

Ordinarily, cemeteries, famous birthplaces, graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original location, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years, shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria, or if they fall within the following categories:

- A religious property deriving primary significance from architectural or artistic distinction or historical importance; or,
- A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- A birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his/her productive life; or
- A cemetery that derives its primary significance from graves of persons of transcendent importance, from age, from distinctive features, or from association with historic events; or
- A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or
- A property achieving significance within the past 50 years if it is of exceptional importance.

These criteria are general in nature and almost any cultural resource may qualify under one of the criteria. But it is up to the nominator to specify how the cultural resource will yield, or is likely to yield information of importance in prehistory or history. As a means of clarifying the nomination process, a more easily understood and applied system of evaluating significance for determination of eligibility to the NRHP has been developed based on the following criteria:

- *Scientific Significance* deals with how a cultural resource fits into research programs and research designs formulated to derive cultural information indicating past economic system, subsistence and procurement activities reflecting man's utilization of a particular area.
- *Historic Significance* deals with how a cultural resource can be identified with particular persons, places, events or cultures.
- *Ethnic Significance* deals with how a cultural resource is held by ethnic populations in terms of religious or spiritual, social, economic, or political importance.
- *Public Significance* deals with how a cultural resource could be used by the general public for interpretative and/or educational purposes.
- *Legal Significance* deals with issues involving how a cultural resource fits the legal criteria (e.g., NRHP or CEQA).
- *Monetary Significance* deals with how much it would cost to extract all the significant information that the resource represents utilizing today's standards and techniques.

The measure of significance is not merely objective or static in nature. It is based upon the ever-changing values, ideas and interests of the researcher, research orientation and designs, community perceptions, legal guidelines and interpretations, and other biased and subjective criteria. However, evaluation must not be directed by too broad of scope nor too narrowly defined or specific research designs, for this could result in a decrease in the number of cultural resources conserved, preserved or protected. The cost of preparing all cultural resource reviews required pursuant to this project phase, as well as the review of the appropriate studies by the planning staff, shall be paid for by the project applicant.

A report resulting from the completion of any cultural resource study within the purview of the City of Barstow, shall be filed with the Archaeological Information Center, San Bernardino County Museum, Redlands. All artifact, field notes, maps, photographs, Native American correspondence (either pertaining to research, field work or monitoring), and reports and/or information provided by other archaeologists shall be catalogued in accordance with the United States Department of the Interior Guidelines.

In the event that human remains are discovered in any location other than a dedicated cemetery, excavation shall immediately cease and there shall be no further disturbance to the site or any adjacent area which is suspected of containing buried human remains until the San Bernardino County Coroner has been notified and has determined that no investigation of the cause of death is required. If it is determined that the human remains are of a Native American origin, then the descendants from the deceased Native Americans must make a recommendation to the landowner or

the person responsible for the excavation work, as to how the remains shall be treated or disposed of, with appropriate dignity, along with any associated grave goods as provided in the California Public Resources Code Section 5097.98; or, where any of the following conditions occur, the landowner or his/her authorized agent or representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance:

- The Native American Heritage Commission (NAHC) is unable to identify a descendant; or
- The descendant identified fails to make a recommendation; or
- The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the NAHC fails to provide measures acceptable to the landowner.

If the human remains are discovered before the City of Barstow has finished the CEQA process, then the City of Barstow shall work with the NAHC and the applicant to develop an agreement for treating and disposing, with appropriate dignity, of the human remains and any associated grave goods. Action implementing such an agreement is exempt from the following: (1) the general prohibition on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (California Health and Safety Code Section 7050.5; or (2) the requirements of CEQA.

Step Three: Mitigation Of Cultural Resources

Step three of the planning process with regard to cultural resources shall include all actions by the case planner after the results of the Phase 1.5 or Phase 2 Archaeological Studies have been completed by the archaeologist and delivered by the client to the case planner. If the resource(s) is/are not considered significant under the existing applied criteria (CEQA: Appendix K; NRHP Section 106), then this aspect of the project is complete with regard to further cultural resource concerns.

Where significant cultural resources will face adverse impacts, the City may require mitigation of these impacts through the implementation of a Phase 3 Archaeological Study. This phase shall be conducted by a qualified archaeologist, and Native American representation selected from the lists provided the client by the case planner. The purpose of this project phase is to treat and alleviate adverse impacts to significant cultural resources.

A proposal to conduct field work must be guided by a scope of work and research design that plainly and clearly identifies the goals of the study and describes in detail the proposed methods of data collection and analysis. The evaluation and approval of any proposal shall be made by the Planning Director. A non-biased, third-party reviewer may be hired to provide input, clarify, or re-scope the archaeological

proposal if the Director feels that it may be inadequate or lacking in methodology or approach.

LIMITATIONS ON MITIGATION

Certain limitations may apply on mitigation measures as follows:

- If it is not feasible to revise the project in order to avoid an adverse impact to a heritage resource, then the City of Barstow shall require the project applicant to mitigate the proposed project impacts to the extent feasible. However, mitigation reports shall not exceed 1% of the total value of the project, as determined by the Building Official.
- Excavation as part of a mitigation plan shall be restricted to those parts of an important cultural resource that would be impacted or destroyed by the proposed project, unless special circumstances require limited excavation of an immediately adjacent area in order to develop important information about the portion of the cultural resource that would be compromised or destroyed.
- Excavation as mitigation shall not be required for an important archaeological resource if the City of Barstow determines that testing or studies already completed have adequately recovered the scientifically important information from and about the resource, provided that the determination is documented within the context of the environmental impact report.
- The limitations on mitigation shall not apply to a private project if the applicant and the City of Barstow jointly decide to comply with the provisions of CEQA as they apply to the mitigation of significant impacts.
- The time and cost limitations described in this section do not apply to surveys and site evaluation activities intended to determine whether the project location contains archaeological resources, and if so, whether the archaeological resources are important as defined herein.

The cost of preparing all cultural resource reviews required pursuant to this project phase, as well as the review of the appropriate studies by the planning staff, shall be paid for by the project applicant. A report resulting from the completion of any cultural resource study within the purview of the City of Barstow, shall be filed with the Archaeological Information Center, San Bernardino County Museum, Redlands. All artifacts, field notes, maps, photographs, Native American correspondence (either pertaining to research, field work or monitoring), and reports and/or information provided by other archaeologists shall be catalogued in accordance with the United States Department of the Interior Guidelines. In the event that human remains are discovered, please refer to the description at the end of section two in this study.

PALEONTOLOGY

A chronological sequence of prehistoric events for the western Mojave Desert was developed in 1962. The sequence begins in the late Pleistocene, when much of the desert region of eastern and southern California was covered by lakes. The existence of an extensive system of interconnected lakes indicates the region had a more temperate and moist climate in recent geologic history. This climate, coupled with the abundant moisture, could support a wide range of plant and animal species that eventually became extinct due to their inability to adapt to the gradual change in climate. This change in climate is referred to as the "altithermal" and resulted in increasingly warmer air temperature and less rainfall. The altithermal resulted in an eventual evaporation of the many lakes and rivers in the region during the latter stages of the Pleistocene.

Evidence of a Pleistocene lake along the Mojave River was first established early this century when the well-exposed ancient lake deposits were discovered along the river canyon near Manix, about 30 miles east of Barstow. Numerous vertebrate fossils, including eleven varieties of birds, were discovered in the lake bed or "lacustrine" deposits. Manix Lake, at its peak, covered an area of between 200 and 300 square miles and was approximately 200 feet deep.

While paleontological resources clearly exist in the vicinity of Barstow, no fossil sites within the Planning Area were identified in the relevant literature. Should fossils be discovered during construction activities, the procedures outlined in the event archaeological material is discovered shall be followed; see IV. Cultural Resources Element and Goal and Policies IV.2.

LAND USE IMPLICATIONS ON CULTURAL RESOURCES

No known cultural resources are threatened by urbanization or are located in within portions of the Plan projected to be urbanized. Therefore, the assigned land uses in the General Plan do not pose any obvious conflicts with cultural resources.