Existing Conditions and Constraints Report for Medea Creek Restoration Project, City of Agoura Hills, California

Prepared for:

Kelly Fisher
City of Agoura Hills
30001 Ladyface Court
Agoura Hills, CA 91301

Prepared by:

Questa Engineering Corporation
1220 Brickyard Cove Road
Suite 206
Pt. Richmond, California 94807
(510) 236-6114

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TABLE OF CONTENTS

APPENDICES

Appendix A – Biological and Cultural Assessments

Appendix B – Sewer Plans

Appendix C – Hydraulic Model Output

INTRODUCTION

Questa Engineering Corporation has been contracted by the City of Agoura Hills to complete design plans for the Medea Creek Restoration Project, located between Kanan Road and Chumash Park. This project consists of investigating the feasibility for the demolition of approximately 400 feet of concrete trapazoidal channel and replacing it with a natural channel stabilized with native vegetation, boulders, and log structures. There are two main objectives for the project: 1) to determine the feasibility and constraints to reestablishing a native riparian corridor and 2) to provide pedestrian connectivity from Chumash Park to Kanan Road.

This report presents the results of Questa's investigation and analysis of the baseline conditions, and discusses the design contraints of the site. This will become the basis and justification for proposed restoration design plan. The purpose of these studies was to gather all necessary background information that will lead to a successful restoration strategy. The report describes the constraints and realities of the project such as existing infrastructure and utility issues.

There are three primary design issues that this report will address:

- ***Trunk Sewer Line.*** There is a major trunk line that drains a significant portion of the City of Agoura Hills. It parallels the existing channel along the west and presents constraints in widening the floodplain of the creek.
- ***Geologic Conditions***. If the concrete channel is removed and the channel width floodplain expanded to the west, the underlying bedrock of the adjacent hillside will provide a constraint. Site geology and its design implications are evaluated.
- ***Flood Control***. The revegetation and restoration of the channel will impact the design flood control conditions in the channel.

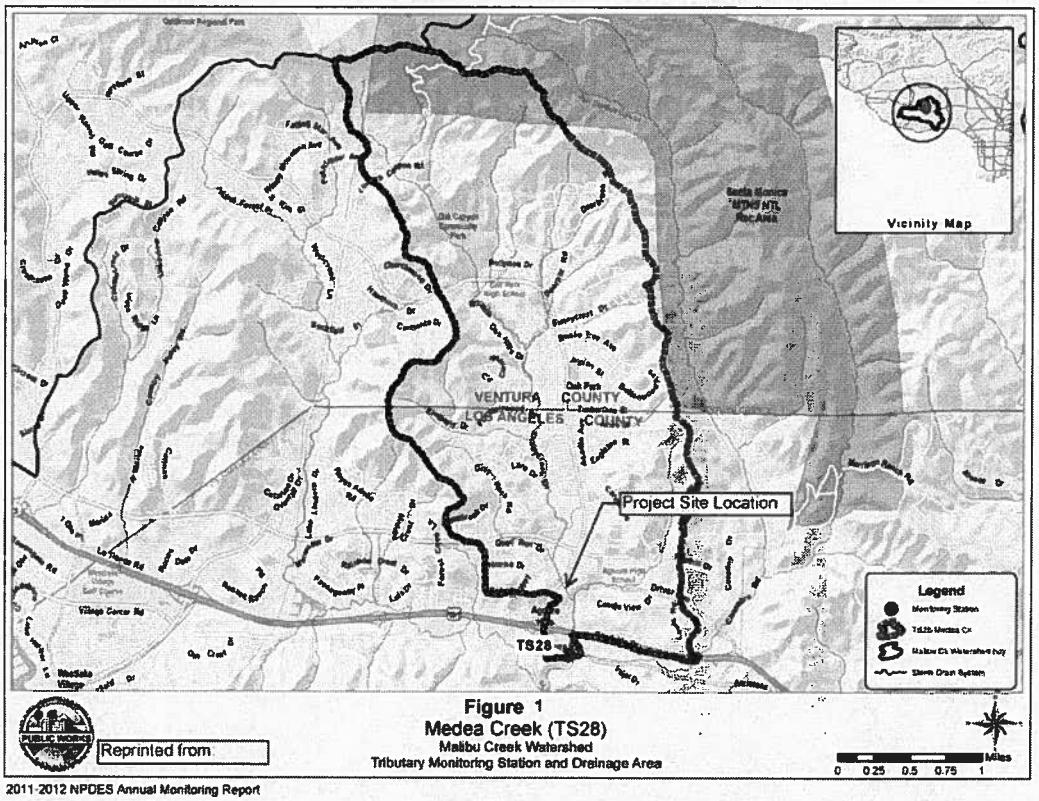
SITE DESCRIPTION

The Medea Creek watershed is located in the western portion of Los Angeles County and the southern portion of Ventura County (**Figure 1**). Medea Creek has its headwaters in the Santa Monica Mountains National Recreation Area and drains through the cities of Oak Park and Agoura Hills. Land use in the Medea Creek subwatershed contains a mix of open space area (61%), residential use (31%) and commercial use (3%). Medea Creek has a total length of 7.56 miles and a drainage area of 6.3 square miles. The project site is located in the lower reaches of the watershed shortly before its intersection with Palo Comado, Cheseboro, and Lindero Creeks which are part of the Malibu Creek watershed, flowing into Malibu Lake and later into the Pacific Ocean. Climate in the vicinity is Mediterranean, characterized by warm summers, cool winters, and markedly seasonal rainfall. Average annual precipitation in the southern portion of the Malibu Creek watershed is 24 inches due to topographical influences of the Santa Monica Mountains and 14 inches in the northern portion of the watershed where the project site is located.

Nearly all rain falls from late autumn to early spring; virtually no precipitation falls during the summer.

The project site is located along Medea Creek, just downstream from Kanan Road and adjacent to Chumash Park (**Figure 2**). The site consists of a 425 foot concrete trapazoidal channel with a steep cement box culvert draining under Kanan Road on the upstream extent of the site and a relatively natural channel reach at the downstream extent consisting of riparian vegetation with some pool habitat.

Figure 1. Medea Creek Watershed Map

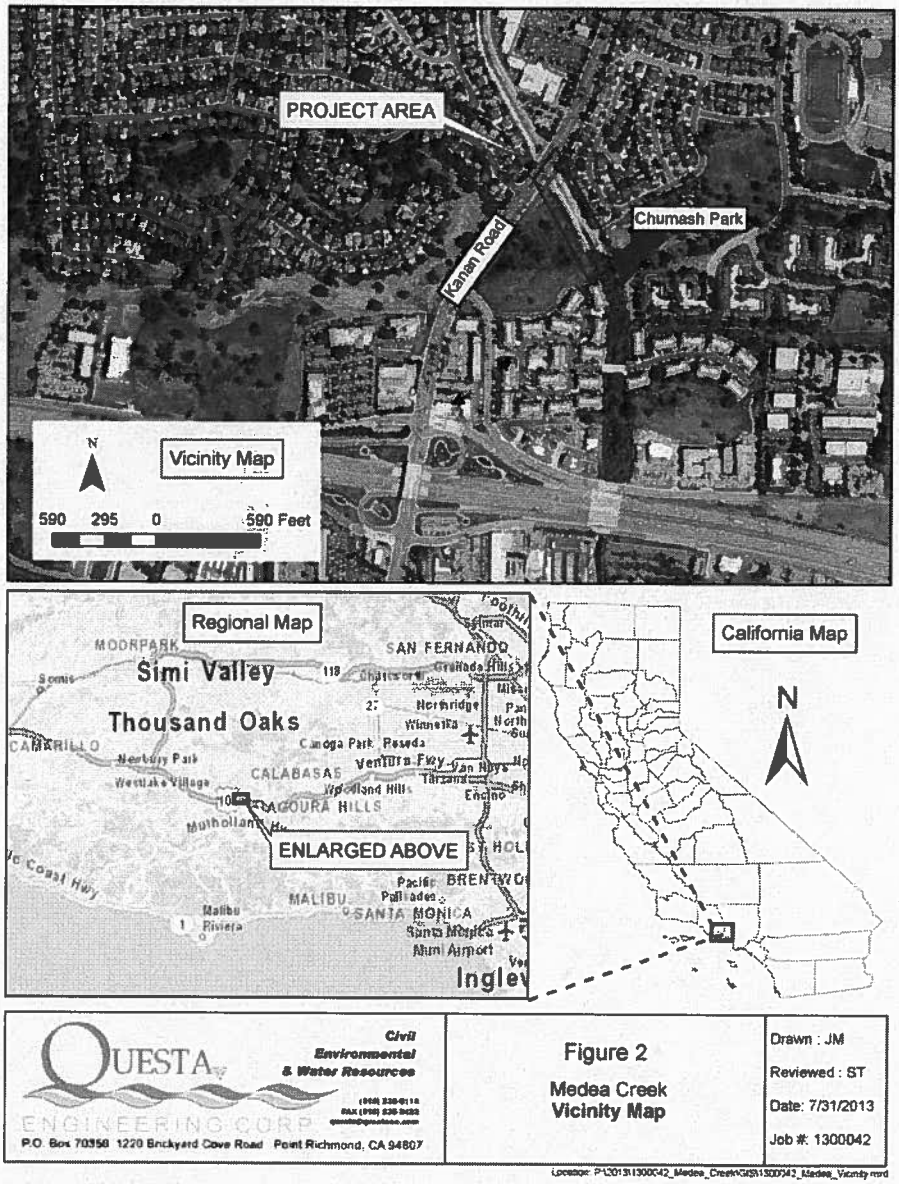


2011-2012 NPDES Annual Monitoring Report

Currently, there is an informal trail along the edge of existing fence lines that connects Chumash Park to Kanan Road. This trail is unimproved consisting of dirt surfacing with steep gradients. It crosses private residential property along the rear portion of the adjacent lots.

The major trunk sewer line paralleling the existing channel on the right bank presents a major constraint for the restoration project and is one of the major focuses of this design analysis.

Figure 2. Medea Creek Vicinity Map



HYDROLOGIC AND HYDRAULIC ANALYSIS

Design Hydrology

The Medea Creek watershed at the project site is approximately 4,000 acres. Hydrologic flow data was determined from the FEMA Flood Insurance Study (FIS) for Los Angeles County dated September 26, 2008. The flow data from the FIS are summarized in Table 1. The flow was taken downstream from Ventura Highway, approximately 800 feet downstream from the project area making this flow data conservative for the purpose project design. These flows have implications for the restoration project and the hydraulic capacity of the channel as discussed in the following paragraphs.

Table 1. Design Discharges

River Reach	Recurrent Interval (cfs)			
	10 yr	50 yr	100 yr	500 yr
Downstream of Ventura Highway	2,560	2,645	7,200	11,270

Hydraulic Analysis

The term "hydraulics" is used to describe the way water flows through the channel. Hydraulic analysis is used to determine how high, how fast, and how much force the flowing water is exerting on the channel bed and banks. Any proposed restoration that would modify existing channel geometry, roughness or hydraulic structures would alter the hydraulic properties of the channel. It is essential that any proposed projects not cause or worsen flooding to the surrounding properties. Removing the concrete and restoring the bed would alter several basic aspects of the channel. The slope would be reduced in a series of steps within the channel. The friction resistance of the channel would be increased through re-establishment of vegetation. Frictional resistance would increase incrementally over time as the vegetative planting becomes mature. The increased frictional resistance of the channel would change flooding depths and impact the velocity of water moving through the channel.

Using a range of potential flows from 100 cfs to 11,270 cfs, hydraulic modeling was performed with the U.S. Army Corps of Engineers' (USACE) HEC-RAS program. The Medea Creek channel geometry was imported into HEC-RAS based on aerial and ground survey provided to Questa by MNS Engineers Incorporated performed in July 2013.

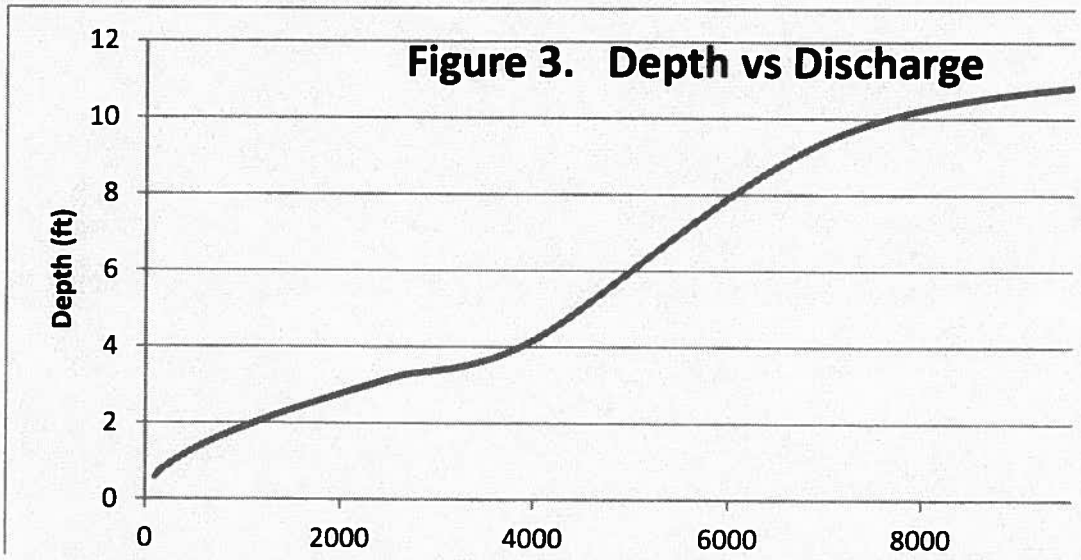
The site topography and channel profile are shown on **Sheets 1-3**. The HEC-RAS sections locations correspond to the stations shown Sheets 2 and 3. For the existing conditions model, a Manning's "n" value of 0.011 was chosen for the entire concrete-

lined channel and a value of 0.035 was used for the floodplain. The two downstream cross sections had increased "n" values of 0.045 (channel) and 0.055 (floodplain) and 0.055 (channel) and 0.075 (floodplain) respectively as the channel becomes more naturally vegetated farther downstream from the trapezoidal channel. A mixed flow regime was chosen for the analysis and normal depth upstream and downstream boundary conditions were used with the exception of the 100-year flow which used a known downstream water surface elevation listed in the FIS of 863 feet (NAVD88).

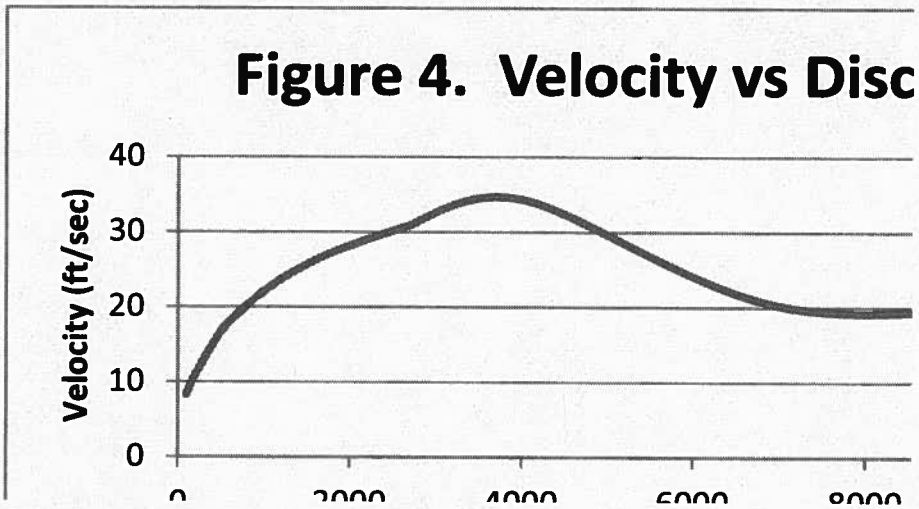
In addition to determine existing conditions, the HEC-RAS model was utilized to provide an analysis of the impact of restoring the channel to a more natural condition. Two different channel scenarios were modeled: 1) proposed conditions—right after construction, and 2) proposed conditions—with full vegetation established. Post-project model results predicted shear forces within the channel which were a critical component in the design of channel stabilization features.

The hydraulic model outputs for selected flow profiles are attached to this report as **Appendix C.** The results for three key variables are summarized below.

Channel Capacity. The existing channel is very efficient. The graph below shows a depth versus discharge curve for the channel (**Figure 3**). The channel is approximately 10 feet high from the channel bottom to the top of the bank. The existing conditions hydraulic model predicts a maximum depth of 9 to 10 feet within the channel at 100-year flow listed in the current FIS of 7,200 cfs. Thus, there is not much of extra depth under the 100 year discharge rate. Extra capacity in the channel that would allow the incorporation of vegetation planting will have to be gain from channel cross section enlargements and structures to prevent flooding outside of current flood control ROW. Initial modeling indicates that restoring the channel with fully matured vegetation would cause water surface elevations to rise above the current top of bank elevations although they would still be far below all of improvements on adjacent properties.



Channel Velocities. Existing flow velocities within the channel are very high due to the low frictional resistance within the concrete-lined trapezoidal channel and the steep slope. **Figure 4** shows average channel velocity versus discharge for the three different scenarios. These high velocities are an important constraint because the erosion potential of the channel can be linked to the velocity of the water moving through the channel. Once the channel is planted with or colonized by vegetation, velocities will be reduced. The design of the restoration project has to take into account that prior to this vegetation being established the channel will have lower frictional resistance, thus making channel erosion a serious concern during the establishment period.



Groundwater Conditions

Based on the riparian vegetation and generally porous thin soils over bedrock, groundwater levels are expected to be generally commensurate with the channel invert. Most of the water flow in the channel during the dry summer months is generated from urban sources.

GEOMORPHIC ANALYSIS

Background and History

The geomorphology of Medea Creek has highly been affected by anthropogenic activities. The air photo sequence shown below highlights the human development that has taken place within the watershed.

Figure 5. Medea Creek Air Photo 1959

Figure 6. Medea Creek Air Photo 1977

Figure 7. Medea Creek Air Photo 1989

Figure 8. Medea Creek Air Photo 2004

Figure 9. Medea Creek Air Photo 2012

Existing Channel Description

The 400-foot proposed restoration reach is comprised of a concrete-lined trapezoidal channel with a slope of 1%. Upstream from the concrete trapezoidal channel, there is a three-barreled box culvert under Kanan Road with 180-foot length, 36-foot width, 8-foot height and 5.8% slope. The channel upstream of Kanan Road is also trapezoidal and concrete-lined.

The naturalized channel downstream from the channelized portion was used as a reference reach to help determine appropriate channel dimensions and determine level of annual high flow. The channel is characterized by a single low-flow channel, gently sloping terraces, and vegetated side slopes.

Trees within the downstream channel reach are primarily willow ranging from 5 to 15 inches in diameter. Large woody debris has collected around the base of some of the trees growing along the lower banks. This established roughness and decreases flow velocities

along the channel banks in addition to hydraulic jump at the end of the concrete-lined channel has led to the formation of a long pool with a depth of up to 3 feet through this channel reach. The channel slope throughout this reach is very flat (less than 0.5%). In some locations, fine sediment including silts and sands has deposited behind debris and vegetation along the channel banks. Channel bed material is also quite fine consisting mostly of sands and silts, with some cobble material.

Evaluation of Bankfull Discharge

Peak flow with a recurrence interval of 1.5 to 2 years is often considered "bankfull discharge," meaning the flow that is primarily responsible for the delineation or shaping of streambeds and banks. This bankfull discharge is basically the discharge that has a 50 percent chance of being exceeded in any given year. It is important in designing a stable channel to develop a reasonable estimation of the bankfull peak flow. This discharge is important from a design perspective because it generally represents the flow at which bedload becomes mobilized and channel features such as point bars and scour holes are developed and maintained. This discharge is one of the primary starting points of the channel design process.

Bankfull discharge was evaluated and determined using two methodologies. First, channel observations were used to identification physical scour lines to determine bankfull depths. Scour lines are used by the U.S. Army Corps of Engineers to determine the Ordinary High Water Mark for use in delineation of Corps jurisdiction over waters of the United States. The Corps definition of OHWM as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas," is used here to apply to scour line identification in the field to determine bankfull widths and depths.

Scour lines were readily observable in Medea Creek, usually due to the presence of a clear line on the bank, terrace shelving, and/or destruction of terrestrial vegetation. Bankfull discharge rates were estimated by examining which discharge rates from the HEC-RAS model yielded the field measured bankfull water depths.

The second method for evaluation bankfull discharge was a Peak Flow Frequency Regression Analysis completed using the 10-, 100- and 500-year flows listed in the FEMA FIS (Table 2).

Both of these techniques produced a bankfull discharge of approximately 500 cfs.

Width/Depth Ratios

The width/depth ratio is defined as the ratio of the bankfull surface width to the mean depth of the bankfull channel. The width/depth ratio is key to understanding the

distribution of energy within a channel, and the ability of various discharges occurring within the channel to move sediment.

Width/depth ratios were calculated for the creek downstream of the concrete trapezoidal channel. The ratio within the downstream channel was approximately 15-20.

Channel Bed Grain Size Analysis

Bedload observations were made downstream of the concrete trapezoidal channel. Based on field observations, the bed sediments are dominated by smaller sized material including sand and silt. This indicates that coarse gravel and cobble type material is not readily available to the creek system. It is also likely that the amount of channel bank armor and urban development upstream has significantly reduced the quantity and size of material being transported as bedload. Given these findings, a key component of the restoration project will be to armor the channel bed to reduce erosion and scour potential that could occur due to the lack of sediment supply. Conversely, it is unlikely that excessive sediment deposition or bedload transport will negatively impact the project. The bedrock beneath the channel should limit excessive degradation through the reach.

PROJECT CONSTRAINTS AND DESIGN ISSUES

Flood Control

The FEMA FIS provided information on peak flows for the 10-, 50-, 100- and 500-year storm events. Of particular concern is the flow volume of the 100-year event of 7,200 cfs. The existing channel was designed to be very efficient in conveying this flow through the project reach. The concrete channel is vegetation free, and hence, has low frictional resistance. It can convey high flows in a small area. The restoration will significantly alter the efficiency of the channel to convey flow and will raise flood levels. Initial modeling shows that water surface elevations could rise above existing top of bank elevations on the western and eastern sides. This would cause shallow flooding within the maintenance access roads and along the lower portion of the hill slope but adjacent residences would still be significantly above the flood elevations. It will, however, spreading flooding onto adjacent private property. In order to prevent this, a low flood/retaining wall along the eastern side of access road should be considered. This would prevent flooding on this private property and allow for a reduction in the hill slope above it. This could facilitate privacy for the property owners as well increase revegetation success on the hillside.

Adjacent Parcel Ownership

Property on the east side of the channel is privately held and no channel widening is proposed along this bank. However, the west side of the channel is an open space area and channel widening or bank top modifications may be incorporated into the design to expand in this direction. However, additional land and/or easement right-of-ways may

need to be secured by the City of Agoura Hills, which could add cost to the overall project.

Fish Passage

Currently, there are no known migratory fish within the project area. The Ringe Dam downstream on Malibu creek prevents fish migration to this area. However, there are resident rainbow trout living in the channel segment downstream from the project reach. High velocities and shallow depth would prevent fish from gaining access upstream of the project site through the Kanan Road box culvert. The project will create additional habitat area and no new fish passage barriers will be constructed.

Biologic Issues

A biologic reconnaissance was been completed for the project. No significant issues were identified. Though some vegetation clearing will be needed for the project this will be a very small amount and the project will more than compensate for any small riparian or wildlife habitat impacts.

Cultural Issues

The project site is located adjacent (less than 1 mile) to known cultural site. The site was mapped and excavated in late 1960's. The project site was not surveyed at that time nor has it been ground surveyed for this project. Because of the sites proximity to the known village and burial sites, it was recommended that additional walking surveys should be completed prior to the development of final permit packages. However, because of the site's high disturbance history, and shallow bedrock it is unlikely that cultural issues will cause significant project permitting or construction issues.

Bedrock Geology

The underlying geology is composed of Conejo Volcanics that generally consist of hard basalt and andesite rocks. Andesitic flows and breccias of the Conejo Volcanics are exposed along the southwestern slope in the vicinity of the proposed project corridor. This rock is hard and is not rippable with a bulldozer. Excavation into this material will require an excavator equipped with rock bits and ram hoes. Excavation will be likely be slow and time consuming. There is a layer of shallow rocky soils that overlays the bedrock. The soil layer varies in thickness but is believed to be 10 to 12 feet thick adjacent to channel and 2 to 3 feet thick beneath the channel. **Sheet 4** shows where believe the bedrock contact is adjacent to the channel. The contact between the soil and bedrock is critical in determining the feasibility of relocation of any sewer lines discussed below.

Utilities

The project reach is in a very urban location with residential development on the east side of the channel. Thus, utilities within the project area either have to be avoided or relocated to accommodate the channel restoration. **Sheet 2 and 3** shows the existing location of these utilities. On the site are the following:

- Trunk Sewer Line
- Storm Drains

There is a major trunk sewer line that drains a significant portion of Agoura Hills. It parallels the existing channel and presents constraints in widening the floodplain of the creek. If the trunk sewer line can be moved or protected in a safe and cost-effective way, it could be feasible to significantly widen the floodplain. Questa has researched the as-built drawings of this pipe and the sewer line is at a depth that is commensurate with the bottom of the channel. **Sheet 3** shows the depth of this line relative the existing concrete channel. The cross sections on **Sheet 4** show it location in context with bedrock

DESIGN CONSTRAINTS ANALYSIS AND CONCLUSIONS

The primary design constraint for is the bed rock geology and its impact on the potential to relocate the existing sewer line.

If the sewer line can be moved, then the option of adding additional floodplain area and a gentle meander pattern to the creek alignment is more feasible. The geophysical study was completed to map the bedrock immediately to the west of the channel. The bedrock conditions from station 15+50 to 17+50 appear to be a major constraint and will make sewer relocation in this area difficult. Based on analysis of bedrock elevations and contours it does not seem feasible to move the sewer line much more than 20 feet to the west from stations 17+50 to 20+00. Depending on design elevations and slopes some bedrock excavation maybe required. This does not allow for extensive floodplain creation but will add flow capacity and habitat area.

If the sewer line is left in its current position then the options for restoration are more limited. In this case, a likely design scenario would be creating an elevated floodplain terrace on the west side of the channel. The terrace would maintain 3 to 4 feet of cover over the sewer line and extensive armoring and anchoring would protect it during large flow events.

The box culvert that carries Medea Creek flows under Kanan road will have to be protected from scour if the concrete channel downstream is removed. This will require a concrete cutoff wall to be constructed at the upstream extent of the restored channel segment. In addition, there is a second significant storm drain entering the channel near the downstream extent of the site which will also require some type of outlet scour protection depending on how the proposed restoration work and grading transitions into the natural topography in this location.

Appendix A
BIOLOGICAL AND CULTURAL ASSESSMENTS

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

805 644 4455
FAX 644 4240

info@rinconconsultants.com
www.rinconconsultants.com

July 18, 2013
Project Number 13-00990

Sydney Temple, P.E.
Principal
Questa Engineering Corporation
1220 Brickyard Cove Road, Suite 206
Point Richmond, CA 94801-4171
stemple@questaec.com

Subject: Biological Constraints Analysis for the Medea Creek Restoration Project, Agoura Hills, Los Angeles County, California

Dear Mr. Temple:

Rincon Consultants, Inc. (Rincon) was retained by the City of Agoura Hills to provide a Biological Constraints Analysis for the Medea Creek Restoration Project, Agoura Hills, Los Angeles County, California. The purpose of this report is to identify potential "fatal flaws" or items associated with biological resources that may cause an exceptional cost or significant project delays, establish baseline conditions for purposes of CEQA and project permitting, and recommend further studies or mitigation measures, if any, that will be appropriate for the project.

PROJECT LOCATION AND DESCRIPTION

The Medea Creek Restoration project site (project site) is generally located within the City of Agoura Hills (City) in western Los Angeles County. The City of Agoura Hills is in the eastern Conejo Valley between the Simi Hills and the Santa Monica Mountains. The site is depicted in Township 1 North, Range 18 West of the U.S. Geographical Survey (USGS) Thousand Oaks 7.5-minute topographic quadrangle. The project site is specifically located between Canwood Street and Thousand Oaks Boulevard on the east side of Kanan Road. The project site includes an approximately 450 foot reach of Medea Creek and its associated access roads and right-of-way, located between Kanan Road and Chumash Park. Land uses surrounding the project site consist of residential single-family housing and Chumash Park to the east, Kanan Road and commercial mixed-use developments to the north, open space to the west, and a naturalized portion of Medea Creek to the south abutted by residential high-density housing development. The proposed activities will include removing the concrete-lined flood channel containing Medea Creek, reestablishing a native riparian corridor, and providing pedestrian connectivity from Chumash Park to Kanan Road.

METHODOLOGY

The Biological Resources Assessment for the proposed project consisted of a review of relevant literature followed by a field reconnaissance survey. The literature review included information on sensitive resource occurrences within a five mile buffer around the project site from the California Department of Fish and Wildlife (CDFW) California Natural Diversity Data Base (CNDDB), Biogeographic Information and Observation System (BIOS – www.bios.dfg.ca.gov), and U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal (http://criticalhabitat.fws.gov). Site plans provided by the client, aerial photographs, and topographic maps were also examined.

Rincon Senior Biologist, Julie Broughton and Biologist Lindsay Griffin, conducted field reconnaissance surveys to document existing site conditions and the potential presence of sensitive biological resources, including sensitive plant and wildlife species, sensitive plant communities, jurisdictional waters and wetlands, and habitat for nesting birds. The survey area included the project site, the adjacent open space parcel to the west of the project site, the shoulder associated with Kanan Road between Canwood Street and Thousand Oaks Boulevard, and adjacent portions of Chumash Park and the naturalized portions of Medea Creek. Existing biological conditions (e.g. vegetative communities, potential presence of sensitive species and/or habitats, and presence of potentially jurisdictional waters) within the project site and survey buffer were documented. The purpose of the surveys was to identify potential sensitive biological resources and constraints for the restoration project.

The potential presence of sensitive species is based on a literature review and field surveys designed to assess habitat suitability only. Definitive surveys to confirm the presence or absence of special-status species were not performed. Definitive surveys for sensitive plant and wildlife species generally require specific survey protocols requiring extensive field survey time to be conducted only at certain times of the year. The findings and opinions conveyed in this report are based on this methodology.

EXISTING SITE CONDITIONS

The field surveys were conducted on June 18, 2013, between the hours of 1200 and 1500, and July 1, 2013, between the hours of 1000 and 1200. Weather conditions during both surveys included an average temperature of 75 degrees Fahrenheit, with winds between 1 and 3 miles per hour and minimal cloud cover.

Medea Creek flows from under Kanan Road via a concrete-lined channel that continues south for approximately 500 feet until it transitions to a natural bottom channel covered by a dense native riparian vegetated canopy. The adjacent western parcel boundary is a hillside with native trees including Valley oak (*Quercus lobata*), Coast live oak (*Quercus agrifolia*), and California sycamore (*Platanus racemosa*). The remainder of the parcel is dominated by several alliances of coastal sage scrub habitat including *Eriogonum fasciculatum* Shrubland Alliance (California buckwheat scrub), *Opuntia littoralis* Shrubland Alliance (coast prickly pear scrub), *Salvia mellifera* Shrubland Alliance (black sage scrub), *Baccharis pilularis* Shrubland Alliance (coyote brush scrub), and interspersed with an herbaceous California semi-natural stands. Along the eastern side of the channel adjacent to the residential

housing are non-native landscape trees including myoporum (*Myoporum laetum*), palm trees (*Phoenix* sp.), and oleander (*Nerium oleander*).

Wildlife activity during the site visit was very low. California ground squirrel (*Otospermophilus beecheyi*) was observed on the hillside. Approximately six house finch (*Haemorhous mexicanus*) were observed perched on the chainlink fence on the west side of the channel. Three northern mockingbirds (*Mimus polyglottos*) were observed foraging in the coyote bush on the hillside. Western gull (*Larus occidentalis*) were observed flying overhead. One red-tailed hawk (*Buteo jamaicensis*) was observed perched on top of a coast live oak on the hillside. Two killdeer (*Charadrius vociferous*) and two black phoebe (*Sayornis nigricans*) were observed in the concrete-lined portion of the channel. One downy woodpecker (*Picoides pubescens*) was observed foraging in a sycamore tree (*Platanus occidentalis*).

SENSITIVE BIOLOGICAL RESOURCES DISCUSSION AND IMPACT ANALYSIS

The CNDDB has records for 11 sensitive plant species, 3 sensitive plant communities, and 10 sensitive wildlife species within the USGS topographic quadrangle that contains the project site. Sensitive plant and wildlife species typically have very specific habitat requirements and the majority of these species are not expected to occur on the project site or within the surrounding area. The following discusses those species with potential to occur on the project site.

Sensitive Plant Species. The project site within the open space hillside does contain suitable soil to sustain Lyon's pentachaeta; however, the species was not observed within anticipated impact areas on the project site. Although definitive surveys to confirm the presence or absence of rare plant species were not performed, Lyon's pentachaeta (*Pentachaeta lyonii*) was observed at two reference sites less than a mile from the project site and therefore, would be blooming on-site if the species was present. No effects to sensitive plant species are expected to occur from this project.

Sensitive Plant Communities. No sensitive plant communities were observed onsite. *Quercus agrifolia* Woodland Alliance (coast live oak woodland) is present on the north facing slopes. Valley oak is also found on the project site but are represented by only three individual trees. Seven of the oak trees located along the shoulder of Kanan Road, in addition to California sycamore, are a result of landscaping as determined by the presence of supportive tree stakes. Although native oak species are present, they do not form a sensitive community because they are not contiguous with the riparian canopy that occurs to the south of the parcel boundary. Native riparian vegetation is present to the south of the project boundary, within the naturalized portion of Medea Creek, and includes arroyo willow (*Salix lasiolepis*), California sycamore and black cottonwood (*Populus trichocarpa*). Construction effects would occur at the northern fringe of this riparian habitat, but in the long term, effects would be beneficial.

Sensitive Wildlife Species. The CNDDB contains several records for sensitive wildlife species within the vicinity of the project site, many of which are associated with the Las Virgenes Creek. The project site is channelized and not suitable for most species of wildlife.

Marginally suitable habitat for western pond turtle (*Emys marmorata*) occurs within the naturalized section of Medea Creek, south of the project site. This species typically prefers larger areas of suitable habitat with basking sites, sandy banks, and nearby upland soils suitable for egg laying. As the project site lacks larger pools, sandy banks, and suitable upland habitat, this species is not expected to occur onsite except potentially as a transitional individual moving between suitable habitat locations. Western pond turtle was not observed onsite during surveys. Therefore, minimal effects to sensitive wildlife species are expected to occur from this project.

Nesting Birds. The California Fish and Game Code (CFGC) Section 3503 and the Migratory Bird Treaty Act (MBTA) protect native birds and their nests. No nests or breeding/nesting behavior such as courtship displays, copulation, vegetation or food carries, presence of fledglings, or territorial displays (e.g. singing or aggression) was observed during the survey. No evidence of raptor nesting was observed during the site visits; however, one red-tailed hawk was observed perched on top of a coast live oak. However, suitable nesting habitat occurs within and directly adjacent to the project site. Therefore, the project has the potential to affect nesting birds if construction occurs during the nesting season.

Jurisdictional Drainages and Wetlands. Although channelized, Medea Creek is subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE), Los Angeles Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW). As the project includes restoration and creation of wetlands, it will have long-term beneficial impacts by creating wetlands. However, restoration will also have temporary impacts on jurisdictional waters, and as such is subject to permits from the agencies listed above.

Protected Trees. The *City of Agoura Hills Appendix A- Oak Tree Preservation Guidelines* prescribes avoiding impacts to all oak trees unless compelling reasons justify the removal of such trees. Valley oak and coast live oak, both protected species, were found on the project site. Although project activities are not proposed in areas where these trees occur, final design plans could require the encroachment of or removal of trees. Should the project impact protected trees, an oak tree permit may be needed pursuant to the provisions of sections 9657 through 9657.5 of the City Zoning Ordinance.

CONCLUSIONS AND RECOMMENDATIONS

The project site does not contain suitable habitat for sensitive plant species, sensitive wildlife or sensitive plant communities where project impacts are anticipated to occur. Therefore, impacts to these sensitive resources as a result of the proposed project are not expected to occur and no further actions with respect to these resources are recommended unless project impacts extend beyond what is currently anticipated.

Nesting Birds. The project site and adjoining area contains habitat suitable for nesting birds. If project activities will occur during the avian nesting season (typically February to September), a survey of the project site and surrounding area for active nests should be conducted by a qualified biologist 1 to 2 weeks prior to construction. If active nest(s) are located, an appropriate buffer shall be established surrounding the nest(s) and shall be

flagged for avoidance. The avoidance buffer shall be determined by the monitoring biologist based upon the species nesting and the activity being conducted. Alternatively, construction within the buffer area may be conducted at the discretion of a qualified biological monitor. The biologist shall monitor the active nest(s) during initial disturbance activities and/or development activities to determine if the recommended avoidance buffers are adequate and that the nests are not being stressed or jeopardized

Jurisdictional Drainages and Wetlands. A Section 404 permit of the Clean Water Act will be required from the ACOE for alteration of Medea Creek. A water quality certification will be required from the RWQCB. Additionally, a Streambed Alteration Agreement will be required from the CDFW. Compliance with the requirements of the appropriate ACOE, CDFW, and RWQCB permits and implementation of any mitigation therein, will reduce impacts to wetlands to a less than significant level.

Protected Trees. If project activities will impact any oak tree, regardless of the size of the tree, a permit from the City of Agoura Hills Department of Planning and Community Development is required. Encroachment, cutting, pruning, the physical removal or relocation of a tree or causing of the death of a tree through damaging, poisoning or other direct or indirect action shall constitute an impact. The protected zone of an oak tree is defined in the *City of Agoura Hills Appendix A- Oak Tree Preservation Guidelines* as the point five (5) feet outside of the dripline that extends inwards to the trunk of the tree and shall be less than fifteen (15) feet from the trunk of an oak tree.

Please do not hesitate to contact Rincon Consultants if you have any questions regarding this biological constraints analysis or the above recommendations.

Sincerely,
RINCON CONSULTANTS, INC.

Lindsay Griffin
Associate Biologist

Lacrissa Davis, MESM
Principal

Nancy Fox-Fernandez, MS
Biologist/Project Manager

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

805 644 4455
FAX 644 4240

info@rinconconsultants.com
www.rinconconsultants.com

July 12, 2013
Project Number 13-00990

Sydney Temple, P.E.
Principal
Questa Engineering Corporation
1220 Brickyard Cove Road, Suite 206
Point Richmond, CA 94801-4171
stemple@questaec.com

Subject: Cultural Resources Study for the Medea Creek Restoration Project, Agoura Hills, Los Angeles County, California

Dear Mr. Temple:

Rincon Consultants, Inc. (Rincon) was retained by Questa Engineering Corporation to provide cultural resources services for the Medea Creek Restoration Project, Agoura Hills, Los Angeles County, California. Specifically, Rincon was tasked with conducting a cultural resources records search and summarizing the findings in a brief letter report. Because a U.S. Army Corps of Engineers (USACE) 404 Permit may be required, this analysis has been performed in accordance with the requirements of Section 106 of the National Historic Preservation Act (NHPA). This project is also subject to the California Environmental Quality Act (CEQA).

Area of Potential Effects

The project Area of Potential Effects (APE) is located within the City of Agoura Hills in western Los Angeles County. The project APE is depicted in Township 1 North, Range 18 West of the U.S. Geographical Survey (USGS) Thousand Oaks 7.5-minute topographic quadrangle (Figure 1). The City of Agoura Hills is in the eastern Conejo Valley between the Simi Hills and the Santa Monica Mountains. The project site, located between Kanan Road and Chumash Park, includes an approximately 450-foot concrete-lined reach of Medea Creek and its associated access roads and right-of-way. The APE is generally bounded by Kanan Road to the northwest, a modern residential tract to the northeast, Chumash Park to the east and southeast, and undeveloped open space to the west and southwest. Based on the currently proposed site design, project impacts will extend into this open space.

The proposed activities will include removing the concrete-lined flood channel containing Medea Creek, reestablishing a native riparian corridor, and providing pedestrian connectivity from Chumash Park to Kanan Road.

Cultural Resources Records Search

Methods

On June 12, 2013, Rincon requested a search of the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center (SCCIC) located at California State University, Fullerton. The search was conducted to identify all previously conducted cultural resources work within a 0.5-mile radius of the project APE, as well as to identify previously recorded cultural resources within a 0.5-mile radius of the project APE. The CHRIS search included a review of the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), the California Points of Historical Interest list, the California Historical Landmarks list, the Archaeological Determinations of Eligibility list, and the California State Historic Resources Inventory list. The records search also included a review of all available historic USGS 7.5- and 15-minute quadrangle maps.

Findings

The SCCIC records search identified a total of 44 previous studies (Table 1 in Attachment A), of which 16 included all or part of the project APE. Eight of the 16 studies included pedestrian surveys. Two of the studies (LA-1791 and LA-1916) cover the majority of the project APE, but no previous studies have been conducted within the last five years.

A total of six previously recorded cultural resources were identified within 0.5 mile of the project APE (Table 2 in Attachment B). One of these resources (P-19-000243) is located within the APE.

P-19-000243

Prehistoric archaeological site P-19-000243 (CA-LAN-243), also known as the Medea Creek Village Site and the Medea Creek Cemetery, was first recorded by R. Crabtree, C. King, and T. Blackburn in 1963. In 1966, a road cut by the Metropolitan Development Corporation and excavation by amateur archaeologist Dwain R. Write exposed an estimated 22 burials. The cemetery was completely excavated by UCLA Archaeological Survey in 1966. The village site was excavated in 1969 by UCLA Archaeological Survey. The cemetery contained approximately 400 human burials and the occupation area with numerous artifacts such as mortars, clam shell disc beads, and lithic artifacts. According to the site record, the remaining portions of the Medea Creek Village Site were destroyed in 1969 by housing construction.

Native American Scoping

Rincon Consultants requested a search of the Sacred Lands File (SLF) at the Native American Heritage Commission (NAHC) on June 12, 2013. The NAHC faxed a response on June 13, 2013 which stated that "a record search of the NAHC Sacred Lands File failed to indicate the presence of Native American traditional cultural places in the project site submitted." The NAHC also provided a contact list of 8 Native American tribes and individuals who may have information regarding the project area. Rincon prepared and mailed letters to these contacts on June 24, 2013.

Mr. Freddie Romero responded via telephone on July 1, 2013, on behalf of the Santa Ynez Band of Chumash Indians Elders Council. Mr. Romero stated that the Elders Council did not have comments regarding this project but wanted to confirm that Rincon sent letters to all the contacts on the NAHC-provided list. Kevin Hunt confirmed for Mr. Romero that letters were sent to all the provided contacts.

As of July 11, 2013, Rincon has not received any additional responses to the letters or phone calls.

Discussion

Based on the results of the background research and cultural resources survey, the proposed project has the potential to affect cultural resources. CA-LAN-243 was recorded within the northeastern corner of the APE. Although the site has been destroyed by excavation and residential construction, subsurface deposits may nonetheless still be present within the APE. Based on the proposed site design, project disturbance extends into the open space to the west, including widening the floodplain of the creek and developing pedestrian footpaths. No evidence was found that the open space area has been surveyed for cultural resources in the last five years. Because of the lack of a recent survey and the apparent significance of CA-LAN-243, Rincon recommends a Phase I Cultural Resources Survey of the exposed ground portions of the APE. In addition, due to the sensitivity of the area and the previous presence of CA-LAN-243 and human remains, Rincon recommends archaeological and Native American monitoring of any project-related ground disturbance.

Intensive Pedestrian Cultural Resources Survey
A cultural resources survey of the open space area should be conducted under the direction of an archaeologist meeting the Secretary of Interior's (1983) professional qualification standards. Any cultural resources that are encountered should be recorded on State of California Department of Parks and Recreation (DPR) Series 523 forms, and the potential for project-related impacts to such sites should be considered. Any historic-age (over 45 years old) buildings, structures, objects, or landscapes within the project area should be evaluated for NRHP/CRHR eligibility to assess the potential of the project to impact to these resources.

Cultural Resources Technical Report
A cultural resources technical report should be prepared that incorporates the results of this constraints analysis, the survey, and any NRHP/CRHR-eligibility evaluations. It should describe the methods and results of the literature review, Native American consultation, intensive pedestrian survey, and the evaluations of built environment resources for NRHP/CRHR eligibility. It should also provide recommendations for the management of cultural resources within and adjacent to the APE. The report should include maps depicting the area surveyed for cultural resources, the locations of cultural resources identified during the survey, and site records or updates for cultural resources encountered during the survey. The report should be prepared in accordance with the Office of Historic Preservation's Archaeological Resource Management Reports (ARMR) guidelines (OHP 1990). As such, it should include an environmental setting and detailed cultural setting that includes prehistoric, ethnographic, and historic period subsections.

Cultural Resources Mitigation Monitoring and Reporting Plan
Prior to project ground-disturbance an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology (qualified archaeologist) should be retained to prepare a cultural resources mitigation monitoring and reporting plan (CRMMP). The purpose of the CRMMP is to establish a clearly defined plan for the NRHP/CRHR eligibility evaluation and treatment of any archaeological materials identified during project implementation. The CRMPP should include: a discussion of the previously identified archaeological resources present within the project APE (specifically, CA-LAN-243); a research design including prehistoric cultural context, research questions and potential data sources, and data collection procedures; a discussion of the cultural resources mitigation measures for the project and how they will be complied with; an unanticipated discovery plan that clearly defines how archaeological resources will be evaluated for NRHP/CRHR eligibility and standards for eligibility, possible avoidance measures in the case significant (NRHP/CRHR eligible) resources are encountered, a data recovery plan to exhaust the data potential for any significant resources that cannot be avoided, including a curation plan; and the standards for a cultural resources report that will present the results of these efforts and how they reduced the level of impacts to cultural resources to less than significant under the Section

106 of NHPA or the State CEQA Guidelines. The CRMPP will include a plan for archaeological and Native American monitoring as well as a detailed course of action for the treatment of unanticipated discovery of cultural resources and human remains. Brief discussions of these key components of the mitigation and monitoring program are presented below.

Archaeological and Native American Monitoring
Based on the results of the records search, the high sensitivity of CA-LAN-243, and the results of the NAHC Sacred Lands File search, Rincon recommends full-time archaeological and Native American monitoring of all project related ground disturbing activities. Archaeological monitoring should be conducted under the direction of a qualified archaeologist.

Discovery of Human Remains
If human remains are found, State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In accordance with this code, in the event of an unanticipated discovery of human remains, the Los Angeles County coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission, which will determine and notify a most likely descendant (MLD). The MLD would complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

Please do not hesitate to contact Rincon Consultants if you have any questions regarding this cultural resources survey or the above recommendations.

Sincerely,
RINCON CONSULTANTS, INC.

Hannah Haas, B.A.
Cultural Resource Specialist

Robert Ramirez, M.A., RPA
Principal Investigator

Duane Vander Pluym, D. Env.
Vice-President

Attachments:
Figure 1. Project Location Map
Attachment A. Table 1- Previous Studies within 0.5 Mile of the APE
Attachment B. Table 2- Previously Recorded Cultural Resources within 0.5 Mile of the APE
Confidential Attachment C. Map of Study Area with Resource and Previous Study Locations

Imagery provided by ESRI and its licensors, 2013. USGS Topo, Copyright:© 2013 National Geographic Society, i-cubed, Calabasas and Thousand Oaks Quadrangles. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.

Project Boundary
One-Half Mile Buffer

N

0 1,000 2,000 Feet

0 250 500 Meters

1:24,000

Project Location

Figure 1

Table 1
Previous Studies Within 0.5 Mile of the APE

SCCIC Report No.	Author	Year	Study	Relationship to Project APE
LA-00081	Rosen, Martin D.	1975	Evaluation of the Archaeological Resources for the Areawide Facilities Plan for the Las Virgenes Municipal District	Within
LA-00126	Wlodarski, Robert J.	1988	An Archaeological Assessment of CA-LAN-1352, (the Lundin Site) Agoura Hills, Los Angeles County, California	Outside
LA-00393	Clewlow, William C. Jr.	1978	An Archaeological Resource Survey and Impact Assessment of Tract 7661, Agoura, Los Angeles County, California	Outside
LA-00530	Clewlow, William C. Jr.	1977	An Archaeological Resource Survey and Impact Assessment of the Morrison Ranch Property, Agoura, California	Outside
LA-00531	Rose, Martin D.	1979	An Archaeological Resource Survey and Impact Assessment of the Reclaimed Water Distribution System of the Las Virgenes Municipal Water District	Outside
LA-00595	Wessel, Richard L.	1979	Assessment of the Impact Upon Cultural Resources by the Proposed Development of Tentative Tract 36303 in Rancho Las Virgenes	Outside
LA-00725	King, Linda B.	1969	The Medea Creek Cemetery (LAN-243): Social Organization and Mortuary Practices	Within
LA-0747	Gibson, Robert O. and Singer, Clay A.	1969	The Medea Creek Village Site 4-LAN-243v: a Functional Lithic Analysis	Within
LA-00819	Leach, Melinda	1980	An Archaeological Resources Assessment of the Proposed Medical Office Facility Site Located North of Canwood Street and West of Kanan Road, Agoura, California	Outside
LA-00829	Tartaglia, Louis J.	1980	Cultural Resource Survey of Tentative Tract Number 35354, Agoura, California	Outside
LA-00926	D'Atlroy, Terence N.	1976	Assessment of the Impact on Archaeological Resources of the Proposed Development of Two Parcels of Land West of Agoura, Los Angeles County	Outside
LA-01168	King, Linda B.	1982	Medea Creek Cemetery: Inland Canalino Patterns of Social Organization, Exchange, and Welfare	Within
LA-01768	Singer, Clay A. and John E. Etwood	1989	Cultural Resources Survey and Impact Assessment for the Proposed Agoura Canyon Ranch Center in the City of Agoura Hills	Outside
LA-01791	Hatheway, Roger and Jeanette McKenna	1989	Archaeological, Historical, Architectural, and Paleontological Investigation of the Kanan Road Interchange at Route 101 Project Area	Within

Table 1
Previous Studies Within 0.5 Mile of the APE

SCCIC Report No.	Author	Year	Study	Relationship to Project APE
LA-01916	McKenna, Jeanette A., Roger G. Hatheway, and Paul E. Langewalter II	1989	Historic Property Survey Report: the Kanan Road Interchange at Route 101 (Ventura Freeway) Project Area	Within
LA-02409	Stelle, Kenneth and Albert Galiardo	1982	For Improvements of the Operational Characteristics of Route 101, the Ventura Freeway in Los Angeles and Ventura Counties, Between Route 405 in Los Angeles, and the Santa Clara River in Oxnard	Outside
LA-02559	King, Chester	1992	Native American Placenames in the Santa Monica Mountains: First Draft	Within
LA-03256	Singer, Clay A.	1968	The Archaeological Survey, UCLA Announces a Volunteer Excavation at the Medea Creek Village Site (LAN-243)	Within
LA-03529	Barbey, Linda L., Linda Hasten, R. W. Sussman, Joseph L. Chartkoff, Jim Toney, and Donald S. Miller	1966	UCAS-137 Excavation of LAN-243 Medea Creek, Los Angeles County	Within
LA-03543	Boyer, Jackie	1967	UCAS-256 Boyer's Undergraduate Project at Medea Creek: Research of Raw Material for Artifacts	Within
LA-03546	Wlodarski, Robert J.	1996	A Phase I Archaeological Study Bikeway Gap Closure Project Cities of Calabasas, Agoura Hills, Westlake Village and Unincorporated Los Angeles County	Outside
LA-03555	King, Thomas and N. Nelson Leanard III	1973	UCAS-306 Evaluation of the Archaeological Resources of Charmlee County Park, Vasquez Rocks Park, Agoura County Park, Los Angeles County	Within
LA-03557	Singer, Clay A., Thomas F. King, and James N. Hill	1969	UCAS-325 Excavation of the Medea Creek Village Site (4-LAN-243)	Within
LA-03587	King, Chester	1994	Prehistoric Native American Cultural Sites in the Santa Monica Mountains	Within
LA-03642	King, Linda B.	1969	The Medea Creek Cemetery (LAN-243): an Investigation of Social Organization From Mortuary Practices	Within
LA-03742	Romani, John F.	1982	Archaeological Survey Report for the 07-LA/VEN 101 Project P.M. 171-38.2/0.0-22.7 07351 - 076620	Outside
LA-03766	Irvine, Kenneth C.	N/A	Do Chumash Burials Demonstrate Status Difference Among Children? Medea Creek Cemetery Revisited	Within

Table 1
Previous Studies Within 0.5 Mile of the APE

SCCIC Report No.	Author	Year	Study	Relationship to Project APE
LA-04246	Wlodarski, Robert J.	1998	A Phase I Archaeological Study: Agoura Hills Riverwalk EIR Project, City of Agoura Hills, County of Los Angeles, California	Within
LA-06601	King, Chester and Parsons, Jeff	2000	Archaeological Record of Settlement Activity in the Simi Hills Malu'liwini	Within
LA-07675	Singer, Clay A.	2004	Phase II Archaeological Investigations at CA-LAN-41, a Prehistoric Deposit in the City of Agoura Hills, Los Angeles County, California	Outside
LA-07676	Singer, Clay A.	2004	Cultural Resources Survey Reevaluation of Archaeological Site CA-LAN-1352, and Impact Assessment for the Cornerstone @ Agoura Village Project in the City of Agoura Hills, Los Angeles County, California	Outside
LA-07677	Bonner, Wayne H.	2003	Cultural Resources Survey Results for the Cingular Wireless Facility Candidate Vy-343-02 (Agoura), 28545 West Driver Avenue, Agoura Hills, Los Angeles County, California	Outside
LA-07678	Budinger, Fred E., Jr.	2002	Proposed Wireless Device Monopole and Equipment Cabinet; Idle Site, 28545 Driver Avenue, Agoura Hills, CA 91301	Outside
LA-07679	Wlodarski, Robert J.	2004	A Phase I Archaeological Study for 29515 Canwood Street City of Agoura Hills, County of Los Angeles, California	Outside
LA-08119	McKenna, Jeanette A.	2006	A Phase I Cultural Resources Investigation of the Waring-Agoura LLC Tract 7661 in the City of Agoura Hills, Los Angeles County, California	Outside
LA-09752	Gonzalez, Matthew, and Kyle Garcia	2009	Results of the Cultural Resource Assessment for the Southern California Edison Replacement of Deteriorated Pole Nos. 1330735E; Los Angeles County, California; WO 6035-4800, 9-4827	Outside
LA-10092	Singer, Clay A.	2000	Cultural Resources Survey and Impact Assessment for an ~18 Acre Property at the Junction of Kanan Road and Agoura Road in the City of Agoura Hills, Los Angeles County, California: A Status Report on Archaeological Site CA-LAN-41	Outside
LA-10208	Sylvia, Barbara	2001	Negative Archaeological Survey Report: Metal Beam Guardrail (MBGR) Along Sections of Route 1010 From Route 134 to the Ventura County Line	Outside
LA-10475	Toren, A. George and Gwen R. Romani	2010	Phase I Archaeological Survey: The Las Virgenes Municipal Water District 1235 ft. Backbone System Improvement Program: Agoura Hills Pipeline Alignment	Outside

Table 1
Previous Studies Within 0.5 Mile of the APE

SCCIC Report No.	Author	Year	Study	Relationship to Project APE
LA-10778	King, Chester	2010	Archaeological Backhoe Test Excavation Program to Determine if Cultural Deposits Exist beneath Agoura Road in the Areas of CA-LAN-41 and CA-LAN-467, Las Virgenes Municipal Water District (LVMWD) Backbone System Improvement Program	Outside
LA-10785	Romani, John F.	2010	Phase I Archaeological Site Status Update: Cornerstone Mixed Use Project Corner of Agoura Road and Cornell Road, Agoura Hills, California	Outside
LA-11835	Grimes, Teresa and Dory, Elysha	2011	Agoura Road Widening, 29008 Agoura Road, Agoura Hills, CA Historic Resource Report	Outside
LA-11836	GPA Environmental	2012	Agoura Road Widening, Draft Initial Study and Mitigated Negative Declaration	Outside
LA-12027	McKenna, Jeanette	2013	A Cultural Resources Investigation for the Proposed Kanan Road-Agoura Road Roundabout Project in the City of Agoura Hills, Los Angeles County, California	Outside

South Central Coastal Information Center, June 2013

Table 2
Previously Recorded Cultural Resources Within 0.5-mile of the APE

Primary Number	Description	NRHP/CRHR Eligibility Status	Recorded/Updated By and Year	Relationship to Project APE
P-19-000032	Sparse prehistoric artifact scatter	Insufficient information	C. King and C.A. Singer 1967	Outside
P-19-000041	Prehistoric village Site; Paramount Ranch	Presumed NRHP/CRHR eligible	S.L. Peak 1951; E. Chandonet, T. Blackburn, and C. King 1961; C. Singer 2000; J. Parsons and C. King 2010	Outside
P-19-000243	Prehistoric village site with approximately 400 burials	Significant resource reportedly completely excavated and eliminated	R. Crabtree, C. King, T. Blackburn, and C. Singer 1963	Within
P-19-001352	Prehistoric midden deposit	Recommended eligible for CRHR	R. L. Wessel 1987; R. Turner 2011	Outside
P-19-100207	Prehistoric isolate	Presumed ineligible	J. McKenna 1989	Outside
P19-100208	Prehistoric isolate	Presumed ineligible	J. McKenna 1989	Outside

South Central Coastal Information Center, June 2013