E. CULTURAL RESOURCES

Introduction

This section of the EIR is based on the cultural resources study prepared by Holman and Associates. Holman and Associates conducted a literature search of the entire project site for previously recorded prehistoric or historic resources. Holman and Associates also conducted a site reconnaissance for the Phase 1 Area. A report of findings was published in 1990. This report included an inventory of potential cultural resources and recommendations for further research, including historic archival research on the Phase 1 Area and recording of the prehistoric sites identified in 1990. This research was carried out in fall 1991, and the results are presented below.

Subsequent to the original surface reconnaissance in 1990, the western boundary of the Phase 1 Area was shifted east so that identified resources are located outside the Phase 1 Area. However, the findings within the original boundaries are discussed here in their entirety. Discussion of potential impacts to cultural resources and recommendations for mitigation reflect the new boundaries. Another alteration of the Phase 1 Area was the addition of the Entry Road Area to the eastern edge of the Phase 1 Survey Area. In 1992, this Entry Road Area and the Phases 2 through 4 Areas (Figure IV.E-1) were surveyed by Holman and Associates. The results of these surveys also are presented below.

Literature Search

In 1990, Holman and Associates submitted copies of the four relevant USGS quadrangle sheets (Patterson, Orestimba Peak, Copper Mountain, and Wilcox Ridge), marked with the project boundaries and access road, to the Central California Information Center at Stanislaus State University in Turlock, California. Their records indicate that the nearest surface reconnaissance to the project area was conducted by Holman and Associates in the Beltran-Shumake parcel within one mile of the eastern border of the project site (Holman, 1988). Their records also indicate that two cultural resources had been previously recorded in the project area: CA-STA-33 and CA-STA-41.

CA-STA-33 was recorded by James Bennyhoff in 1956 as an occupation midden 1.2 miles from Oak Flats Ranch. The site was recorded on both sides of Salado Creek and included a sizable midden deposit, with 29 bedrock mortars, pictographs, and two "rain rocks".

CA-STA-41 was recorded by F. F. Latta in 1950 along Oak Flats Road outside the Phase 1 Area. The site was described as an occupation site at a spring at the location of the "old Salty Smith place" along Salado Creek. A mortar was noted at the time of the site's recording.

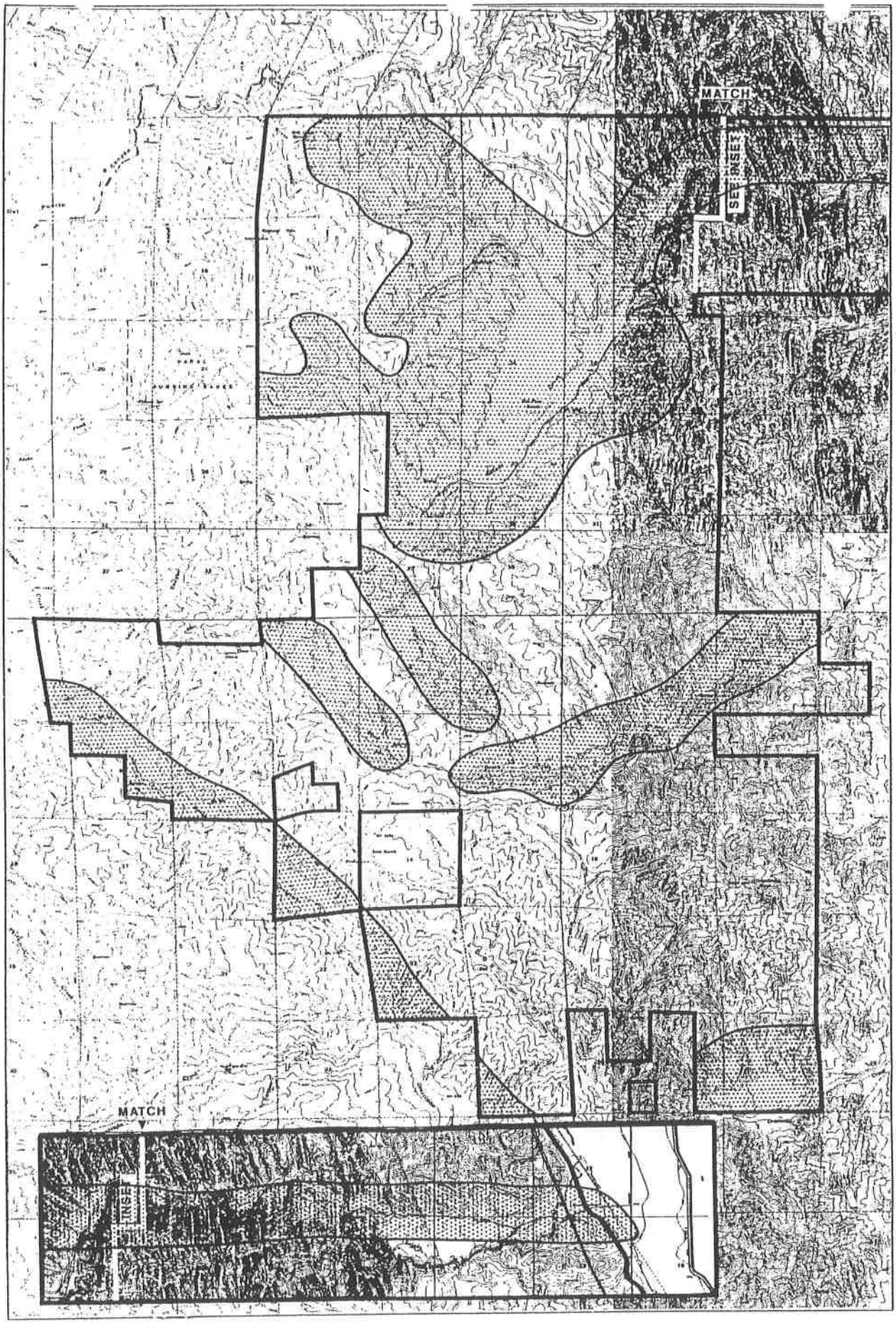

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Figure IV.E-1

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The Central California Information Center indicates that the project area has not been systematically surveyed prior to 1990. Their opinion that numerous cultural resources must be present within the project area is supported by Holman and Associates' experience in the area. Therefore, a surface reconnaissance of the entire project area was necessary to adequately identify the cultural resources present that may be impacted by the project.

The ethnographic literature indicates that the project area lies within the western boundary of the territory of the prehistoric and ethnographic Northern Yokuts (Kroeber, 1925; Wallace, 1978). These hunter-gathers would have exploited a variety of food stuffs in the project area for subsistence. A variety of seasonal camps and settlements, including ceremonial sites, might be anticipated in the area.

Methodology

The surface reconnaissance of the Phase 1 area was conducted by Holman and Associates in late February 1990 and the Phases 2 through 4 Areas were surveyed in April 1992. The entry road area was surveyed in June 1992.

Phase 1 Area

Phase 1 (Figure IV.E-1) was divided into three zones that reflected both topography and potential archaeological sensitivity. These were then subjected to a mixed strategy reconnaissance, using a combination of general and intensive inspection of the ground surface. The first was the Salado, Orestimba, and Crow creeks areas, their adjacent areas including Oak Flat and Orestimba Valley, and the drainages that feed into the creeks. These areas were intensively surveyed with transects spaced approximately 100 feet apart, zig-zagging as the survey team progressed so that the areas surveyed were much close together. The second zone comprised the adjacent slopes (up to 1,300 feet in altitude), and the low bald hills that dot Oak Flats and Orestimba Valley away from the areas near Salado Creek. These were subjected to a more general ground survey with the field crew walking transects of 100 to 200 feet apart, again zig-zagging as they progressed. The third zone comprised the steepest slopes and ridges of the high hills (1,200 to 1,600 feet) that border Oak Flat and its drainage. This last zone was subjected to a general surface reconnaissance as topography and access permitted.

The ground surface was carefully examined for indicators of prehistoric sites such as lithic debitage or tools, grinding implements, fire cracked rock (FCR), bedrock mortars, darkened soil, calcined bone, or shell. Rock outcrops and surfaces were examined for bedrock mortar depressions (BRMs), evidence of occupation in rock shelters, or pictographs painted on protected rock surfaces. Evidence of historic resources included examination of standing structures and the search for fallen architectural debris, surface trash scatters, building foundations, etc. As surface indicators of prehistoric or historic resources

were recognized, they were located on field survey maps with notes taken on the character and location of the sites.

Phase 2-4 Areas

In Phase 2, due to time and budgetary constraints, only the valleys and flats associated with creeks and drainages were surveyed (as the results of Phase 1 indicated these were the most sensitive areas). Each prehistoric and historic resource encountered was briefly described and plotted on United States Geologic Survey maps. Formal site records were not completed for the sites found during survey of the Phase 2 through 4 areas.

All potential cultural resource identified in 1990 were revisited by Holman and Associates in the fall of 1991. A formal site record was completed for each site including a site map, feature record, and photographs. Part of the procedure included hand augering of prehistoric locations to determine depth of midden deposits, and the presence or absence of midden/site at peripheral or suspected area. A backhoe was used to confirm site boundaries by trenching beyond visible boundaries of surface indicators, and probed for evidence of sites where isolated prehistoric artifacts had been observed in 1990. Only those sites within the Phase 1 Survey area were augered and backhoed.

Dr. Catherine Julien conducted historic archival research on the Phase 1 Survey Area in fall 1991 (Appendix B). Her efforts supported the dating and characterization of 19th century historic remains in the Phase 1 Survey Area, and suggested that several others might be present that were not identified in the field. Her data resulted in the consolidation of several historic loci and the recognition of a previously unrecognized potential resource.

Setting

Introduction

Ethnographic, archaeological, and historic background information for the site is included in Appendix A. Five prehistoric sites and three historic resources/ potential resources have been identified in the Phase 1 Survey Area. In addition, three prehistoric (Loci 1, 2 and 3) and two historic (Loci 2H and 4H) are just outside of Phase 1 but, because they could be affected by secondary impacts of Phase 1 development, are addressed in the Phase 1 discussion. In addition, one prehistoric isolate (Locus 6) was included within the boundary of Locus 7. Three other isolates identified in 1990 were not relocated. As a result of historic research, three previously identified historic resources have been merged into a single resource (Locus 10H/11H/12H). A previously unidentified potential historic resource (Locus 18H) was identified from archival research alone.

Eighteen prehistoric sites and 11 historic resources/potential resources were identified in the Villages 2 through 5 Areas. The historic archival research report by Dr. Catherine Julien for the Villages 2 through 5 Areas is pending. Therefore, it is possible that Dr. Julien's report will document additional historic resources which were not discovered during field reconnaissance.

Prehistoric Sites and Locations in the Phase 1 Area

Occupation/Pictograph/Ceremonial Site

Locus 7. Locus 7 is the previously recorded site CA-STA-33. It is located on both sides of Salado Creek and included both an occupation midden and bedrock features. The occupation midden covers a large area of creek margin and an adjacent hill north of Oak Flat Road. The midden deposit appears darkly discolored in contrast to the surrounding soils and horehound appears to favor this location. The surface of the midden area is flecked with sparse fragments of shell and calcined (burned) bone brought up by rodent activity. Fragments of FCR, a complete pestle, hopper mortar fragments, a possible mano (hand grinding stone), and basalt debitage, chert, and obsidian were noted on the surface in 1991 during recording. A probable house depression was recognized within the midden area in 1991. Also associated with the midden are two low bedrock surfaces along the north bank of Salado Creek that have deep bedrock mortars. An extensive area of bedrock occurs on the hill within the midden area but only a single BRM was located there. Another isolated bedrock mortar was identified in 1991 at the northern edge of the site. A total of three *Olivella* beads were observed in 1990 in fresh rodent hole backdirt in two locations, suggesting burials were present. During site recording in 1991, a fragment of a human long bone was observed in similar backdirt. In the process of augering at the site to determine the depth of the midden, fragments of human bone were recovered from another location in 1991. These finds clearly document that at least two, and probably more, human burials are present in the midden portion of the site. All fragments of human bone were reburied immediately where they were found.

Large outcrops of bedrock to the south of the midden area proved to include at least two rock shelters that contained BRMs on the floors of the shelters. This same area of bedrock also contained at least three small panels with pictographs in red, white, and black. It is possible that others are present as well. At least one of the bedrock mortars associated with the shelters bears traces of red pigment. Two previously recorded "rain rocks" (cupule rocks) were relocated during the recording process in 1991. Both rocks bear numerous pits or round depressions, often on vertical and slanting surfaces as well as horizontal parts of the rock, as are common in such features in California (Heizer, 1953). One of these cupule rocks is part of a larger bedrock outcrop bearing bedrock mortar cupules as well.

Other Sites. Locus 2 has several shelters that were apparently inhabited in prehistoric times. One of these shelters bears at least one smudge of red pigment on its fire blackened ceiling. No other pigmented areas in red or other colors were noted during the recording of the site in 1991. At the present time, available data do not justify the reassignment of Locus 2 to the Occupation/Pictograph/Ceremonial site category.

Occupation/Seed Processing Sites

These are prehistoric sites characterized by areas of occupation midden generally associated with rock outcrops and bedrock mortars. The midden deposits exhibit typical darkened discoloration, fire altered rocks, lithics, ground stone artifacts, flecks of shell, and sparse calcined bone. Previously, Loci 13 and 14 were classified as "occupation sites without bedrock mortars" (Holman and Associates, 1990). However, a bedrock mortar feature was identified at Locus 14 during recording in 1991, leaving Locus 13 the sole example of an occupation site without bedrock mortars. Locus 13 is located in an area between two sites with bedrock mortars, and a portable cobble mortar was recorded at Locus 13. Therefore, all the sites in question are now included under the category "Occupation/Seed Processing Sites". These are:

Locus 1. This site is located just outside the western boundary of the Phase 1 Survey Area, and just outside of the project boundary. It was found to be present on both sides of Lotta Creek upstream from its confluence with Salado Creek. The site consists of two large rock outcrops with a total of 33 BRMs on the east side of the creek and an apparently associated occupation just downstream on the west bank. Among the surface indicators noted was a chert projectile point observed within the bounds of the midden area.

Locus 2. This large site is located just north of the confluence of Lotta Creek and Salado Creek, just outside of the Phase 1 Area. The heaviest evidence of occupation and BRM features occurs to the northeast of this confluence. There are three rock outcrops with BRMs at this site. Two small rock shelters are present with evidence of occupation, including several small mortar depressions in each. One of these shelters has a smudge of red pigment on its fire blackened roof that was recognized in 1991. However, this does not justify the label "pictograph" at this time. Also noted on the surface was a mano fragment, core/hammerstone, and a sandstone bowl mortar fragment.

A set of rock walls, possibly a historic corral, (Locus 3H) is also present, although the existence of one of these walls sealing part of an occupation shelter suggests that some or all of the walls may be prehistoric in date (see discussion of Locus 2H).

Locus 3. This site lies outside of the Phase 1 area and is an extensive area located around a small spring area on the north bank of Salado Creek just east of Locus 2. The site consists of widely scattered surface indicators, seven rock outcrops with a total of 27 BRMs, and two areas of concentrated, discolored occupation midden. Chert and obsidian debitage, burned bones, and other artifacts and cultural materials are present. The spring area has been modified in historic times with the digging of a reservoir, but most of the site remained undisturbed. A historic resource (Locus 4H) occurs at this site as well, and historic metal, glass, and ceramics are scattered over the surface of the prehistoric deposit in the southern portion of the site.

Locus 13. This site is an extensive area on both sides of Salado Creek, at the confluence of two small drainages with Salado Creek. The site is located in the eastern portion of the Phase 1 survey area. A small spring on the west side of the creek appears to have been the focus of the most intense midden deposition. A single portable cobble mortar and a small triangular chert projectile point were observed at that location. Backhoeing in 1991 on the east bank of Salado Creek demonstrated that Locus 13 and Locus 15 to the east are separate occupation sites.

Locus 14. This site is an extensive scatter of FCR and lithics along the south bank of Salado Creek to the west of Locus 13. Among the artifacts noted on the surface were two manos, a shaped pestle, a possible cobble pestle, and a basalt core. A "cobble mortar"is present in the creek bed and, in 1991, an outcrop with two bedrock mortar holes was identified on the west side of the creek bank.

Locus 15. This site is an extensive scatter of sparse FCR and lithics on the east and west side of Salado Creek at the east end of the Phase 1 research area. Surface artifacts include a fragment of a sandstone metate, and very sparse lithics. Two rock outcrops with five bedrock mortar holes are associated with the site.

Isolated Bedrock Mortar

Locus 5. A small outcrop of sandstone with a single BRM was identified in 1990 on the south side of Salado Creek between Locus 4 and Locus CA-Sta-33 (Holman and Associates, 1990). It was observed on the north edge of Oak Flat Road. No other artifacts, midden, or other surface indicators of an occupation site were observed in 1990 or during recording in 1991. Because this locus lies outside the Phase 1 boundary, the area was not backhoed in 1991. It may be a detached outlying feature of Locus 7.

Isolates

These loci represented one or two isolated flakes, apparent FCR, or an isolated artifact observed in 1990 that may represent single, isolated events of use or deposition (Holman and Associates, 1990). However, given the proximity to creeks, it was believed at that time that they may represent evidence of buried resources brought up by rodent activities.

Locus 8. Two isolated basaltic flakes were observed on the south bank of Salado Creek in 1990. No other cultural indicators were observed at that location at the time of the surface reconnaissance.

Locus 16. A single fragment of possible FCR was observed on the south bank of Salado Creek in 1990. Despite careful searching, no other cultural materials were observed, although a possible buried resource was suspected at that time. However, the item was not relocated in 1991, and backhoe trenching in the area failed to reveal any evidence of a midden deposit at the location.

Locus 17. A single basalt flake was observed in 1990 on the south edge of Oak Flat Road near where a major drainage enters Oak Flats. It was viewed as an isolate or possibly evidence of a buried resource at this location. The item was not relocated in 1991, and backhoe trenching did not reveal any evidence of a prehistoric site at that location.

Other Isolates. In the course of recording historic sites Locus 9H and Locus 10H/11H/12H, single prehistoric artifacts were found. A complete portable slab hopper mortar was found among the scattered rocks at Locus 10H/11H/12H. No other evidence of a prehistoric occupation was observed during recording. Two backhoe trenches failed to document evidence of a prehistoric site. A fragment of a portable slab mortar was observed in 1991 in the yard of the Oak Flats Ranch (Locus 9H). Again, no evidence of other artifacts or midden deposits were observed in an auger hole placed in the area. Both cases appear to reflect the historic or recent removal of artifacts from other sites, probably Locus 7, and their transport to the historic locations as oddities; or, in the case of Locus 10H/11H/12H, one of the rocks for a now disturbed foundation.

Possible Procurement Areas

The original surface reconnaissance in 1990 identified five areas (Loci A-E) with surface scatters of water-rounded cobbles of quartzite, chert, blocky quartz. Other materials were observed in several areas of the Phase 1 survey area that were apparently derived from the sediments or decomposing conglomerates at those locations. Many of the cobbles were fractured but

their edges were sufficiently rounded to suggest that breakage was due to the same natural agencies that rounded and transported the cobbles to the locations where they are found today. However, sparse, widely scattered cobble fragments bear scars fresh enough to indicate they were probably battered intentionally in prehistoric times. As the materials were hard silicates, the cobbles on the surface would have made suitable hammerstones or sources of material for stone working. Thus, the fragments noted in the field initially appeared to be debris of testing cobbles for the proper material which was carried off for use later.

Each of these locations was revisited and examined during the site recording process in 1991. After careful examination of the surface cobbles, the field team concluded that no evidence of intentional stone working, battering, or material assaying was present at any of the five locations originally identified. Much of the material exhibited natural internal, intersecting planes of fracture that would account for the fractured, angular character of the items originally suspected to be evidence of possible stone working. No bifaces, retouch, or recognizable flakes with bulbs of percussion were observed anywhere in the areas in question. Agencies of breakage would include freezing, plowing, and harrowing. The latter agent appears to be the most probable cause of the "fresh appearing" items at the site. Sandstone cobbles in the same context were heavily scratched and faceted by plowing or harrowing. Several quartzite pieces exhibited deep, narrow notches on their edges that were the result of a thin, hard object like a plow or harrow blade, and not the expected broader flake scar resulting from the blows of a hammerstone. During careful recording of the prehistoric sites in 1991, no artifacts or debitage of the materials present in the cobble scatters in question were identified at any of the prehistoric sites within the Phase 1 area.

Loci A-E are not cultural resources. Therefore, the category "Potential Procurement Areas" identified in the initial survey of the Phase 1 area has been eliminated from the inventory of cultural resources.

Historic Sites and Locations in the Phase 1 Area

The historic archival research on the Phase 1 Area conducted by Dr. Catherine Julien (Appendix B) documented the land ownership and land use patterns of the area from the 1850s to the 20th century. This research served to identify several individuals who were likely associated with the historic resources identified in 1990 and outline the occupation history of these locations. In several instances, this research has identified locations of 19th century occupation that were not visible from ground reconnaissance. These historic data have also served to suggest which historic loci are better considered part of a single resource.

Ranches or Homesites

Locus 9H - The Oak Flats Ranch Complex. The entire complex of buildings of the existing Oak Flats Ranch was recognized as a historic resource during surface reconnaissance of the complex for prehistoric resources. The ranch is located on both sides of Salado Creek, approximately in the middle of the survey area. A total of ten structures are present within the ranch complex. These include a residence, two barns, an apparent former stable, a water tower, and various other structures. An extensive corral system and an alignment of black walnut trees line the east side of the Oak Flat Road.

The residence and several metal-sided structures are recent in date. The remainder appear to be at least 50 years old or older, although most exhibit evidence of recent use. All structures, including the barns and former stable, exhibit round nails in their construction, indicative of post-1890 construction. However, one structure (Structure 2A) is a small wooden building with an add-on located on the south bank of Salado Creek northeast of the residence. This building has a number of square nails on its south side, suggesting that the structure may be older, or that the building materials were reused from an earlier structure.

Dr. Julien's historic research revealed that by 1876, David Hays and James T. Chism were partners who each owned part of the Oak Flat area. The land was used for cattle and sheep grazing. Hays sold his property to Hiram Gist in April 1876 and later, another partner, Rogers, was added. In 1880, Rogers bought out his partners, but Chism apparently continued as manager until 1890 when the ranch was acquired by Frederick Hyde. During the period circa 1870-1880, Chism was apparently the junior partner who managed the stock raising operation on the ranch for his partners. He continued as manager, even after selling his interest to Hyde. The senior partner was believed to have owned and used the house spotted at the location of today's Oak Flats Ranch. Chism lived on his original holding in 1876 at a location east of the ranch complex (Locus 18H). There is no information as to his place of residence in the period 1880-1890.

No evidence of the original Oak Flats Ranch house of the period circa 1876-1890 has been identified. However, structure 2A may be a remnant of an outbuilding of the period, or one that contains materials reused from an earlier building constructed prior to 1890. Although no surface artifacts or other evidence of trash deposits were observed in survey and recording, buried resources such as outhouses, trash pits, and demolished structures are likely to be present.

Locus 4H. This is a possible historic homesite within the boundaries of prehistoric resource Locus 4. The surface indicators consist of two rough unmortared stone foundations, and an associated turn-of-the-century trash scatter. Among the artifacts noted were fragments of glass, china, metal cans, a cast-iron pot fragment, and a cast-iron stove part. To the east of the

foundations, a scatter of sawed lumber may indicate a demolished structure, fence or other feature. The foundation was close to the same spring that attracted the occupation (Locus 3) of the location in prehistoric times. Amethyst glass suggests a date of circa 1880-1915 (Munsey, 1970). The solder-sealed metal food cans suggest a date prior to 1905 (Duffield, 1986).

Historic data suggest that Locus 4H was likely to have been the area occupied between 1880-1895 by Joseph Choate. The southeast quarter of Section 26 (T6S,R6E) was later divided in 1895 so that the west half was retained by Joseph, and the east half was acquired by L. R. and M. S. Choate. Trash deposits, privies, and other resources related to this occupation may be present in addition to the surface artifacts and existing foundations. This locus is outside the Phase 1 area.

Locus 2H. An extensive intermittent complex of rock walls defining a rectangular enclosure was observed on the east side of Lotta Creek among the BRM rock outcrops of prehistoric site Locus 2. The location was originally identified as a possible historic period corral (Holman and Associates, 1990). The absence of wood fixtures or barbed wire fence line suggested that the enclosure has been abandoned for a long time. No historic artifacts were observed on the ground within the area of rock walls or nearby. It was originally suggested that if 19th century in date, the "corral" may have been part of the homesite recognized to the east at Locus 4H.

Reexamination of the rock alignments, and the surrounding prehistoric site Locus 2 failed to provide any more chronological information on the rock walls that appear to create an enclosure. An associated rock shelter (Shelter A) has a portion of its opening sealed by a dry laid wall as well, possibly suggesting that this portion and, by extension, the other rock walls, may in fact be prehistoric (See discussion of Locus 2).

However, Dr. Julien's archival research revealed that the location of Locus 2H might be that of "Groondika's or Grundike's Camp" and "March's Sheep Camp" spotted on a map dating to 1876. Her research suggests that the location may have been used later in the 19th century for a chicken ranch by the Choate family. Given the location, her suggestion that Locus 2H might be associated with Edward's Spa or Health Camp in the 1880s appears unlikely. This locus lies outside the Phase 1 Area.

Locus 10H/11H/12H. This resource represents the combining of three loci identified and discussed separately in the preliminary inventory of 1990 (Holman and Associates, 1990). Dr. Julien's historic research suggests that the three might best be treated as a single resource area.

The area of Locus 10 consists of large heavy timber cribbed platform supporting a windmill and water tank, and an adjacent more modern water tank, located on the south side of Salado Creek to the west of the Oak Flats

Ranch Complex. Only round nails (post-1890) were observed in its construction at the time of the surface reconnaissance and, at that time, it was considered only as part of the Oak Flats Ranch complex (Holman and Associates, 1990). Revisiting the site for recording purposes revealed that a concentration of large rocks around the platform might represent the scattered remains of a foundation, now dismantled. One of these rocks, incidentally, bore a single mortar depression, but no other evidence of prehistoric occupation was found in the area. Locus 12H was recorded as a standing well pipe and associated lumber that might represent a dismantled windmill and possible former home site. Locus 11H was a single fragment of 19th century brown pattern transfer ceramic found as an isolate to the northeast of Locus 10H. The fragment in question was not relocated during the site recording process.

Dr. Julien's research suggests that the area of Locus 10H/11H/12H might represent remnants of a possible occupation associated with Stephen Rogers. The northwest quarter of Section 25 was the property of Rogers and was transferred by his widow to Frederick Hyde in 1890. Only the shred of ceramic and possible much scattered rock concentration suggest a possible former structure and associated trash. The well pipes, windmill, metal water tanks, and probably the wooden platform itself are of the 20th century and represent much later use of the area for stock watering by the Oak Flats Ranch. There remains the possibility that earlier, 19th century resources remain somewhere in the area.

Locus 18H (Possible). Dr. Julien's archival research revealed that the 1876 road map of the area spotted a structure labeled "Chism's" south of Salado Creek on the north side of Oak Flat Road near the southern edge of Section 13. This was apparently the residence of James T. Chism, the partner of David Mays who owned and resided at the Oak Flats Ranch. Chism may have lived at that location until circa 1880. The structure was apparently removed before the turn of the century.

No evidence of a stone foundation, trash scatter, or other historic period remains was observed in the area during the original surface reconnaissance in 1990. Therefore, Locus 18H remains only a possible historic resource. The absence of trash or other surface indicators may have resulted from burial through colluvial deposition in that area.

Phases 2 through 4 and Entry Road

Introduction

The following inventory of potential cultural resources in the Phases 2 through 4 and Entry Road project area has been prepared using data obtained in a preliminary surface reconnaissance of the area, and the results of historic archival research. As will be noted, several potential resources were recognized from archival data that were not found during the initial surface

reconnaissance. These have been included in the inventory and would be addressed in later field investigations.

Fifteen prehistoric and 12 historic cultural resources sites were recognized in the surface reconnaissance. Review of the results of Dr. Julien's archival research indicate that at least three and possibly five additional historic resources may be present which were not located durinng the surface reconnaissance. Potential historic resource locations derived from archival data but not located during the initial survey are indicated by a "?" after the locus number. Therefore the following inventory lists a total of 36 potential cultural resources. These include 21 prehistoric resources and 15 historic resources. However, only 30 locations are actually represented, as Loci 22 and 22, 29 and 29H?, 33 and 33H?, 35, and 35H, as well as 42 and 42H are all locations where both prehistoric and historic resources are found together either overlapping or contiguous to one another.

Prehistoric Sites and Locations for Phases 2 through 4 and Entry Road

Occupational/Seed Processing Sites.

Locus 25. This large site is located just north of the Phase 1 area at the confluence of two unnamed drainages which drain into Salado Creek. The site consists of a large bedrock outcrop with 21 BRMs and a surrounding midden area on the east side of the drainage. The midden is well defined and contains numerous pieces of calcined bone, bits of shell and chert, and obsidian and basalt lithic debitage.

Locus 26. This site is located on the north fork of the two drainages which lead to locus 25. The site is apparently a small camp on a flat-topped knoll on the east side of the drainage. The site is distinguished by a poorly developed midden containing several pieces of calcined bone and lithic debitage. A portable sandstone mortar and a small chert side-notched projectile point fragment were also discovered.

Locus 28. This site lies just north/east of locus 25 on the north side of a steep rocky slope which forms a minor drainage. The dominant feature of this site is a rock shelter which is approximately 30 meters long by 15 meters wide and 2 meters high. Just outside the mouth of the rockshelter are 3 BRMs. In the minor drainage just above the rockshelter is a small milling station consisting of 6 BRMs. Inside the shelter are numerous cupules arranged in straight rows. Also inside the shelter is a dry-laid sandstone wall which shows evidence of fire blackening and which probably served as a wind break. There was no obvious midden associated with this site. However, subsurface testing may expose a midden deposit within and around the rock shelter.

Locus 30. This site is located on both sides of Salado Creek just within the eastern portion of the project area where the Entry Road Area meets the project boundary. On the north side of the creek is a sparse midden deposit with a few bits of shell and lithic debitage. Along the creek bed are 3 BRMs. On the south side of the creek, on the side of a steep rocky slope, is a small rock shelter with three BRMs at its mouth. It is possible that the sparse midden deposit extends to both sides of the creek.

Locus 32. This site is located on both sides of Salado Creek within the Entry Road Area approximately 3/4 mile east of locus 30. On the north side of Salado Creek the site is situated on an alluvial terrace which contains a sparse midden deposit with several pieces of shell. To the north of this terrace, at the base of a steep slope, are several small sandstone outcrops with 14 BRMs. On the south side of Salado Creek, directly opposite the alluvial terrace, is a rock shelter near the base of a steep rocky slope which contains 3 BRMs.

Locus 37. This site is located along the north/west side of Crow Creek just north/east of the fork in the dirt road which leads from Crow Creek to Orestimba Peak. The site is situated around an outcrop of sandstone boulders which contain 33 BRMs. The surrounding midden is well defined and exhibits numerous bits of shell and calcined bone. Several pieces of chert, basalt, and obsidian debitage were also noted.

Locus 39. This site is located on the north/west side of Crow Creek just outside the easternmost project boundary. However, it is very possible that subsurface testing will demonstrate that the site extends onto the project area. The site consists of some 20 BRMs in a low bedrock outcrop and a very sparse surrounding midden deposit.

Locus 44. This large site is located on both sides of Orestimba Creek at the far western side of Orestimba Valley, at the junction of Orestimba Valley and the Orestimba Narrows. The site exhibits at least 80 BRMs located on both sides of Orestimba Creek. The habitation area (which is partially outside the project boundary) is on the south side of the creek along an alluvial terrace which is approximately 5 meters above creek level. Although no well-defined midden was discovered on this alluvial terrace, 2 portable sandstone mortars, a basalt uni-face scrapper, and a few pieces of chert and basalt lithic debitage were discovered. The presence of these artifacts, their relative association with the large number of BRMs, and the fact that the alluvial terrace represents an ideal location for a large habitation site are all strong indications that an extensive buried midden deposit

probably exists at this site. Several small rockshelters and one large rockshelter were also discovered on a rocky bluff along the western side of the habitation area. However, no obvious evidence of habitation was present in these shelters.

Seed Processing Sites.

These are prehistoric sites characterized by the presence of BRMs without associated midden deposits. These sites are generally considered to be outlying seed processing areas which were probably associated with nearby habitation sites. It should be noted, however, that subsurface testing may locate buried midden deposits in direct association with these BRMs thus relegating these sites to the category of Occupation/Seed Processing Sites.

Locus 19. This site is located just outside the south western edge of the Phase 1 Area at the base of a minor drainage which empties into Salado Creek. The site consists of 21 BRMs within the bedrock at the base of the drainage.

Locus 22. This site consists of a single BRM located on the south side of Salado Creek opposite historic site Locus 22H. No midden deposits were observed at the time of the surface reconnaissance.

Locus 24. This site is located on the south bank of a bend in Salado Creek 0.08 miles northeast of Locus 23H. The site consists of 4 BRMs with no apparent surface manifestations of midden deposit.

Locus 29. This site is located approximately 3/4 mile south/west of locus 30 on the west side of Salado Creek. The site consists of 3 BRMs on large sandstone boulders at the base of a steep hill which lies between two small seasonal drainages.

Locus 31. This site lies within the Entry Road Area just east of the Phase 1 area. The site consists of two BRMs at the base of Salado Creek.

Locus 33. This site lies within the Entry Road area and is located 0.15 miles east of Locus 32. The site consists of 3 BRMs located on the south side of Oak Flat Road on the south side of Salado Creek.

Locus 34. This site is located approximately 3/4 mile east of Locus 28 (an Occupation/Seed Processing Site) within the Entry Road Area. The site consists of 14 BRMs within the bedrock on both sides of Salado Creek.

Locus 35. This site is located within the Entry Road Area approximately 1/2 mile east of locus 34. This site was originally recorded in 1950 by F. F. Latta and was given the permanent trinomial site number of CA-STA-41. The site was described as an occupation site at the location of the "Old Salty Smith place". A mortar was noted at the time of the site's recording. However, although we discovered 17 BRMs at this site, no evidence of midden or other artifacts was noted. Subsurface testing may demonstrate the presence of a buried midden deposit.

Locus 38. This site is located on the north side of Crow Creek, approximately 1/2 mile north/east of locus 37, at the confluence of a seasonal drainage and Crow Creek. The site consists of seven BRMs on the west side of the seasonal drainage and a chert core on the east side.

Locus 40. This site is located at the eastern end of Orestimba Valley at the far south/east corner of the project boundary. The site consists of at least 40 BRMs scattered along an approximately 1/8-mile-long section of the Orestimba Creek bed. A single chert flake was also discovered in this vicinity.

Locus 42. This site is located approximately 1/2 mile west of locus 40 and lies just outside the southern edge of the project boundary. The site consists of 11 BRMs which are situated on both sides of Orestimba Creek. Although the site lies outside the project boundary, it is possible that subsurface testing will uncover an associated midden deposit within the project area.

Locus 43. This site is located approximately 1/3 mile west of locus 42 and, similar to locus 42, it lies just outside the project boundary. The site consists of six BRMs and a single basalt flake, all on the north side of Orestimba Creek. Subsurface testing may also uncover an associated midden deposit within the project area.

Locus 45. This site is located on the north fork of Orestimba Creek near the western most edge of the project boundary and west of the Isom Ranch property. The site consists of 4 BRMs at the base of the

creek. A single obsidian bi-face fragment was also discovered within a meter of the BRMs.

Entry Road Area

The potential prehistoric archaeological sensitivity of the Secondary Entry Road corridor is low. This is due to the general topography of the area which is hilly grassland and exhibits only minor drainages. This lack of major drainages combined with the fact that the area is virtually bereft of oak trees and bedrock outcrops are the primary reasons why the area's prehistoric archaeological sensitivity is deemed to be low.

Historic Sites and Locations for Phases 2 through 4

Ranches or Home Sites

Locus 20H. This possible historic home site is located along an unnamed dirt road near the north/east corner of section 3 of the 7.5 minute Wilcox Ridge quadrangle map. The site consists of a house, shed, and outhouse, which were probably built in the mid-20th century. All three structures are wood-sided and constructed with wire nails. The house is constructed on a concrete slab foundation. However, surrounding these structures are turn-of-the-century trash deposits. These artifacts include applied lip bottles, amethyst glass, square cut nails, hand painted porcelain, and red-on-white transfer print ware. Thus, earlier structures almost certainly preceded the existing ones and may be buried on site. The evidence of late 19th century-early 20th century occupation observed at Locus 20H, and the later existing structures, were apparently associated with individuals who leased the land from the Southern Pacific Railroad.

Locus 21H. This possible historic home site is located approximately 1/3 mile south of locus 20H at the base of a small hill just west of an unnamed dirt road. The site consists of a scatter of manuported sandstone rocks, a possible historic grave or privy hole, some cast iron stove parts, and the remains of a horse-drawn buckboard. The scatter of manuported rocks may be the remains of a structural foundation. The possible grave or privy hole is indicated by a rock filled depression approximately 6.5 ft. long by 2.5 ft. wide with a worn oak post sticking up vertically at one end. The post is flattened at the top and exhibits nail holes indicating that a (now missing) cross piece was once attached to it. The evidence of late 19th century-early 20th century occupation observed at Locus 20H, and the later existing structures were apparently associated with individuals who leased the land from the Southern Pacific Railroad.

Locus 22H. This possible historic home site is located just north of Oak Flat Road, approximately 1/5 of a mile east of where Oak Flat Road exits the project boundary. The site consists of a house, a concrete well, a collapsed shed and outhouse, and an associated trash scatter. The structures are wood sided, constructed with wire nails, and are built on redwood foundations. The artifacts in the trash scatter include mid-20th century cans and bottles. A structure was spotted at that location on the 1943 United States Geologic Survey map of the area, supporting the dating by surface artifacts of mid-20th century. However, an earlier occupation may have been present at this location or nearby.

Locus 23H. This site is located on the north side of Oak Flat Road approximately 1/8th mile north/east of locus 22H. The site is apparently a trash dump which may have been associated with a now destroyed or buried structure but which probably is associated with locus 22H. The artifacts in the trash dump are mostly bottles and cans which date approximately from the 1930s to the 1950s, and includes a license plate which dates to 1939. It remains for future research to document whether there was a 19th century occupation or period of deposition at Locus 23H.

Locus 27H. This possible historic home site is located approximately 200 meters north/east of locus 26 on the west side of an unnamed dirt road which leads from Oak Flat Road to the Salt Grass Springs. The site consists of a partially buried dry-laid sandstone foundation (approximately 25 ft. square) with an associated trash scatter. The artifacts in the trash scatter include non-diagnostic white ware and crockery, a porcelain coffee cup shard, and window glass. No structure was spotted at the location of Locus 27H on the United States Geologic maps of 1943, 1956(a), or 1971(a).

The occupational remains at Locus 27H may have been associated with tenant use of the land, perhaps by the Oak Flat Ranch, in the late 19th or early 20th century. However, early 20th century data suggest that another structure may have been located in the area that may have been associated with the occupation of this locus, or represents another separate undiscovered historic resource.

Locus 29H (Possible). This potential historic resource was spotted on the 1919 United States Geologic Survey map as a single structure on the west side of Oak Flat Road just east of prehistoric Locus 29. No structure was spotted at that location on the Road Survey map of 1876, nor on the United States Geologic Survey maps of 1940, 1953, and 1978. No surface indicators of this possible resource were observed during the Phase 2-5 surface reconnaissance. It would seem that the structure spotted on the 1919 map was associated with either the Rogers' ownership or that of F. Hyde after 1890.

Locus 33H (Potential). This potential historic resource was spotted on the 1919 United States Geologic Survey map as a single structure on the north side of Oak Flat Road just north of prehistoric Locus 33 at a point 0.15 miles east of prehistoric Locus 32. The structure was not spotted on maps of the area in 1940 and thereafter (United States Geologic Survey 1940, 1953, 1978). No surface indicators of an historic site were recognized during the Phase 2 through 5 surface reconnaissance. Locus 33H was probably associated with the ownership of the location by McKenney, Paray, or Manual Rogers ca. 1878-1919.

Locus 35H. This possible historic home site is located within the boundaries of the prehistoric locus 35. The prehistoric locus was recorded in 1950 by F. F. Latta who noted its location as the "Old Salty Smith place" along Salado Creek. The historic component of this site consists of the partial remains of a concrete well. No evidence of other structures is present. However, such associated structures could be buried or demolished which would be determined during subsurface testing of the site. No structure was spotted at this location on the 1919, 1940, 1953, and 1978 United States Geologic Survey map of the area. This location may correspond with a sheep camp run by Smith in 1875.

Locus 36H. This possible historic ranch site is located on the south side of Crow Creek just east of the junction of the south fork of Oak Flat Road and the unnamed dirt road which parallels Crow Creek. The site consists of a house, two outbuildings, a privy, corral, and windmill. The house is built atop concrete pilings and the house and outbuildings are constructed of standard cut wood and wire nails. Thus the structures were probably constructed in the mid-20th century. No diagnostic artifacts and very little associated trash was noted. A structure was spotted at the location of Locus 36H on the 1943, 1956(b), and 1972(c) United States Geologic Survey maps of the area. However, this does not preclude an earlier occupation at the site.

Locus 41H. This possible historic ranch site is located approximately 1/8 mile west of locus 40 on the north side of Orestimba Creek just south of the project boundary. The site consists of a rectangular, dry-laid rock wall feature approximately 100 ft. wide by 130 ft. long which is probably the remains of a corral. Although this feature is outside of the project boundary, subsurface testing may locate associated features (a house, outbuildings, etc.) within the project boundary. No structures were spotted at the location of Locus 41H on the 1919 United States Geologic Survey map of the area. However, a structure was spotted approximately 1/8 mile farther east, close to the west edge of prehistoric Locus 40, on the map of 1940. The structure was no longer spotted at that location on the maps of 1955 and 1971(b). These data suggest that Locus 41H was probably associated with the house or barn spotted just to the east in 1940, but does not preclude the possibility that an earlier (pre-

1919) occupation may have occurred in the general area that may have extended into the Project Area.

Locus 42H. This possible historic home site is located within the boundaries of the prehistoric locus 42 on the north side of Orestimba Creek, just south of the project boundary. The site consists of a partially buried dry-laid stone well and some cast-iron stove parts. Although the well is outside the project boundary, associated buried features may be discovered during subsurface testing. No structure was spotted at that location on the 1919 United States Geologic Survey maps of 1919, 1940, 1955, and 1971(b). However, as noted in the discussion of Locus 41H, a structure was spotted farther east on the map of 1940, although the surface indicators suggest a possible 19th century-early 20th century occupation at Locus 42H.

Locus 44H. This possible historic home site is located within the boundaries of the prehistoric locus 44 on both sides of Orestimba Creek at the far west side of Orestimba Valley. The site consists of a partially buried dry-laid stone foundation on the south side of the creek, and two dry-laid rock retaining walls and a possible historic cemetery or privy area on the north side of the creek. The possible cemetery is located near the top of a low hill on the east side of the junction of the dirt road which parallels Orestimba Creek and a jeep trail which leads north to a modern hunting camp. This feature is distinguished by a leveled area approximately 60 ft. by 60 ft. with two oval, rock filled depressions approximately 6.5 ft. long by 2.5 ft. wide. Although a light scatter of clear bottle glass and white-ware ceramics was noted across the site, no diagnostic artifacts were found.

No structure is spotted at or near the location of Locus 44H on the 1919 or 1940 United States Geologic Survey maps of the area. However, both the 1955 and 1971(b) maps spot a structure at the spring northwest of the flat and another to the south outside the project area. While suggesting that the occupation of the area of the site is late, the fact that the foundation and other features are located away from the structures spotted on the maps suggsts that an earlier, pre-1919 occupation may have been present as well.

Locus 46H. This possible historic home site is located approximately two miles north/east of locus 45 at the junction of an unnamed seasonal drainage and the north fork of Orestimba Creek. The site consists of a mostly buried dry-laid stone foundation approximately 8 ft. wide by 12 ft. long with no associated artifacts present on the ground surface. No structure was spotted at this location on the United States Geologic Survey maps of 1943, 1956(b), and 1971(c). This suggests a possible late 19th-early 20th century occupation at Locus 46H.

Locus 47H. This historic cultural resource is located 2.2 miles north of Oak Flat Road just east of the dirt road along the entry road survey corridor. The resource is a possible home site which consists of a windmill, three water tanks, a water pump shed, a corral and an outbuilding. No evidence of a ranch house or farm house was noted. However, the presence of several shards of amethyst glass and a few shards of hand painted porcelain and non-descript transfer print wares indicates that the site was in use by at least the early part of the twentieth century. No structures are spotted at the location of Locus 47H on the 1919 United States Geologic Survey map of the area. No structures, save the windmill, were spotted on later maps of the same area (ibid. 1940, 1953, 1978). However, the location of Locus 41H along the road may mark the original location of a homestead.

Locus 48H (Possible). The potential historic resource Locus 48H was located approximately 2.7 miles north of Oak Flat Road on the north (west) side of the unnamed dirt road along the Entry Road survey corridor. The locus was situated about 0.5 miles northeast of Locus 47H. This locus was not identified during the Phase 2 through 5 surface reconnaissance, but a single structure is spotted at that location on the United States Geologic Survey map of 1919. No structure was spotted there on later maps of the same area (United States Geologic Survey 1940, 1953, 1978). The structure spotted on the 1919 map (Locus 48H) may represent a late 19th century structure or homesite.

Summary of Findings

Prehistoric Resources in the Phase 1 Area

The eight prehistoric sites in the Phase 1 survey area were all found in proximity to the course of Salado Creek and its tributary, Lotta Creek. The intensive survey of the other drainages and survey of the remainder of the Phase 1 survey area revealed no other prehistoric resources, with the exception of isolates.

The seven occupation sites with midden deposits and an isolated bedrock mortar located along Salado and Lotta creeks indicate that proximity to water for camp use and acorn processing was the primary criterion for the location of occupation sites. Favored areas were those at or near bedrock outcrops suitable for bedrock mortars. The lack of suitable bedrock was apparently compensated for, in the case of Locus 13, with portable hopper mortars. Given historic changes in vegetation in the area, including tree cutting and grazing, it is not clear just how extensive were the original stands of oaks along Salado Creek. They certainly occur in considerable numbers at the west and eastern portions of Salado Creek where occupation sites appear to concentrate.

The apparent absence of evidence of prehistoric occupation or use of areas away from the creekside locations is probably due to a number of factors. The drainages and hillsides away from the creeks were apparently too steep-sided

and waterless to attract occupation. Distant stands of oaks and other resources would still be close enough to be collected and brought back to the creekside campsites for processing and use. The lack of evidence of hunting behavior away from occupation sites remains unexplained at this time. Hunting certainly did occur in the area as reflected by projectile points, calcined animal bones, and flake tools at occupation sites. Yet the expected lithic scatters were not found. It is possible that the extensive overgrazing of the area has resulted in sufficient slope erosion to disturb or cover ephemeral flake scatters.

A large area along Salado Creek appears to lack evidence of occupation sites. This area of flat stream border extends from Locus 7 in the west to Locus 14 in the east, a distance of approximately 1.7 miles (2.74 km). The existing Oak Flats Ranch complex is located in the middle of this stretch of Salado Creek. The area is virtually treeless today, although historic woodcutting and grazing may have reduced the numbers of oaks in that portion of the survey area. However, the area is distant from both surviving oak stands and outcrops of sandstone suitable for bedrock mortars, suggesting why no occupation sites were observed in this area.

As a group, the identified prehistoric resources exhibit the potential for providing important information on the lifeways of the Northern Yokuts who once exploited the area. The constituents and features in the midden deposits can provide information on ancient diet, seasonality, technology, and settlement patterns. Items such as shell beads and obsidian reflect long distance trade patterns as well. Shell beads and projectile points also serve as time markers that provide chronological information on the sites. Dates for the sites can also be provided by carbon-14 dating of charcoal from hearths and obsidian hydration if present in the sites.

Identification of human bone during augering, and on the surface of Locus CA-Sta-33, confirms that human burials are present at that site. Although shell beads or human bone have not been observed at other occupation middens located within the Phase 1 survey area, human burials may be expected at any of these as well. Burials are not only important sources of information of physical anthropology, and social and wealth differences, but are of special concern to the Native Americans. The presence of pictographs and cupule rocks at Locus CA-Sta-33 indicates that site also contains information on the ritual life of the ancient inhabitants of the area. Cupule rocks have been recorded to have served as "baby rocks", "rain rocks", or social/territorial markers in Central California (Heizer, 1953; Parkman, 1986).

Locus 7 appears to be the richest, most intensively occupied of the occupation sites in the Phase 1 survey area. Given its character and special features, it may have served as a local ceremonial and social center. The status of Locus 2 as a site with pictographs is not confirmed at this time.

Prehistoric Resources in the Phases 2 through 4 Areas

Eight occupation sites with midden deposits and 13 seed processing sites were discovered during the Phases 2 through 4 archaeological survey. Of these, loci 25 and 44 are apparently the richest and most intensively occupied of the occupation sites. The locations of all the sites are consistent with the locational criteria discussed above relative to the eight prehistoric sites discovered in the Phase 1 Area. The sites in the Phases 2 through 4 Areas were also located in close proximity to major creeks and drainages and favored those areas which were near or at bedrock outcrops suitable for bedrock mortars. No site locations falling outside these criteria were noted.

These areas also display the same lack of evidence of hunting behavior away from occupation sites as noted in the Phase 1 area. Evidence that hunting did occur is reflected by the presence of projectile points, calcined bone, and flake tools at occupation sites. Yet, here too, we did not find the expected lithic scatters. As noted in the Phase 1 summary, it is possible that overgrazing has resulted in slope erosion sufficient to disturb or cover ephemeral flake scatters.

The identified prehistoric resources in Phases 1 and Villages 2 through 5 exhibit the same potential for providing important information on the lifeways of the Northern Yokuts who once exploited these areas. The constituents and features in the midden deposits can provide information on ancient diet, seasonality, technology, and settlement patterns. Items such as shell beads and obsidian reflect long distance trade patterns as well. Shell beads and projectile points also serve as time markers that provide chronological information on the sites. Dates for the sites can also be provided by carbon-14 dating of charcoal from hearths and obsidian hydration, if present in the sites. Although shell beads or human bone have not been observed at the occupation middens located within the Phases 2 through 5 survey areas, human burials may be expected at any of these sites.

No pictographs were discovered in the Phases 2 through 4 Areas. However, the presence of extensive cupule marks at Locus 25 indicates that this site contains information on the ritual life of the ancient inhabitants of the area. Cupule rocks have been recorded to have served as "baby rocks", "rain rocks", or as social/territorial markers in Central California (Hizer 1953; Parkman, 1986).

Historic Resources in the Phase 1 Area

Five historic locations have been located along Salado and Lotta creeks during the Phase 1 survey. Four were previously identified in 1990, and the fifth (Locus 18H) was not recognized in 1990 or 1991 field efforts and remains only a potential location derived from historic data. All are homesites and ranches located on flat areas near water for the same reason that prehistoric sites were frequently located in the same places. Wells and windmills would be located

in areas where the water table was close, and were part of the historic land use pattern. Corrals and trash deposits would be located as needed, again with convenience as a factor.

Historic research on the Phase 1 survey area (Appendix B) indicates that the locations in question date to the 1870s-circa 1900, although the Oak Flats Ranch (Locus 9H) has continued to be occupied up until the present time. Early land owners/inhabitants include Joseph Choate, L. R. and M. S. Choate (Locus 4H), "Grundike" (Locus 2H), David Hays (Locus 9H), James T. Chism (Locus 18H), and Stephen Rogers (Locus 10H/11H/12H). Significant buried resources such as foundations, trash deposits, privies, etc. may be present at these locations, although only Locus 4H has a surface scatter of trash at this time. Loci 2H, 4H, 10H/11H/12H have surface remnants of structures or features associated with them. Although none of the structures at the Oak Flats Ranch appear to date to the 1870s, remnants of that occupation may still be present as buried resources.

The recording and documentation of existing historic structures and the search for and analysis of buried historic archaeological resources provides a means of documenting the lifeways of people in the research area during the historic period. Analysis of architecture and trash deposits, and the placement of facilities and outbuildings can illustrate much about the ethnicity, socio-economic position, and land use patterns of the ranchers who took up the use of the area in historic times.

Historic Resources in the Phases 2 through 4 Areas

A total of 15 potential historic have been inventoried, of which 12 were recognized during the surface reconnaissance. Three potential resources, Loci 29H?, 33H?, and 48H?, are known solely from archival data to date, but physiical manifestations may be present below surface. All are potentially historic home sites and ranches located on flat areas. As in Phase 1, wells and windmills were located in areas where the water table was close, and were part of the historic land use pattern. Corrals and trash deposits would be located as needed, again with convenience as a factor.

Of the 12 sites identified, three of them (Loci 20H, 22H, and 36H) consist of standing structures which were apparently built in the early to mid-20th Century. At least one of these sites (Locus 20H) is located on or near a buried or demolished site which probably dates to the late 19th Century. Locus 21H is a site with dry-laid stone foundation with associated historic artifact and trash, and two sites, Loci 27H and 46H, consist of partially buried dry-laid stone foundations, without surface artifacts but which almost certainly date to the historic era. Loci 35H and 42H are well features and Loci 23H and 41H are trash dumps and corral features, respectively. These four loci are only possibly associated with buried homesites. The rock filled depressions at Loci 21H and 44H may be privy holes or possible historic graves.

Potential Impacts

Direct Impacts

These are impacts that directly destroy or disturb cultural resources as a result of construction. Sources of these impacts include grading, excavation, trenching, landscaping, rock and soil removal for materials, installation of utilities, road construction, etc. Also included are impacts resulting from demolition of existing structures, foundation and tree removal, and excavation or augering for replanting and landscaping, posts, fences, etc. Deep burial for grading purposes can be another source of impact due to compaction, as can pre-fill surface treatment procedures such as vegetation removal and the use of a sheepsfoot.

Secondary (Indirect) Impacts

Secondary impacts to cultural resources are expected to result from the increased access and growth of residents in the project area. Impacts to cultural resources would result from unauthorized surface collection of prehistoric or historic artifacts, looting of sites for bottles or prehistoric artifacts, and looting of prehistoric graves at midden sites during or after construction. Another impact would be vandalism to special features such as pictographs, cupule rocks, and historic foundations.

Resource-Specific Potential Impacts

Prehistoric Resources in the Phase 1 Area

Locus 1. This resource lies entirely outside the Phase 1 area and would not suffer direct impacts during Phase 1. However, it may suffer secondary impacts.

Locus 2. This resource lies entirely outside the Phase 1 area and would not suffer direct impacts during Phase 1. However, it may suffer secondary impacts.

Locus 3. This resource lies entirely outside the Phase 1 area and would not suffer direct impacts during Phase 1. However, it may suffer secondary impacts.

Locus 5. This resource lies entirely outside the Phase 1 area and would not suffer direct impacts during Phase 1. However, it may suffer secondary impacts. Any widening of the existing road west of the boundary of the Phase 1 area would impact this resource.

Locus 7. This resource lies within the Phase 1 area and has been set aside as open space as part of Indian Rocks Park. As such, it would not be subject to the same construction-related impacts as other resources in the area. However, any installation of paths, benches, lights, watering systems, other facilities, landscaping, planting, etc. would potentially impact the resource. The resource would be exposed to considerable potential secondary impacts as a result of its visibility, ease of access, and attention drawn to it by its status and any signage or educational information or tours provided. An additional factor is that the midden area is heavily occupied by ground squirrels that constantly bring up soil, often containing artifacts and at times human bones. Any casual, unsupervised access to the site could result in the carrying off of these materials.

Locus 13. Direct impacts to this resource would result from the construction of planned attached single family dwellings, the 14th hole of the proposed Oak Flat Golf Course, a portion of the community park, and associated roads, etc. proposed in that area. Secondary impacts in the park area and golf course may result as well.

Locus 14. Direct impacts to this resource would potentially result from construction of the 13th hole of the proposed Oak Flat Golf Course. Secondary impacts would probably impact that portion of the resource located on the opposite (west) side of the creek. Direct impacts may result from construction of single family dwelling units uphill from the resource in the same area.

Locus 15. Direct impacts to that portion of the site on the east bank of the creek would result from construction of attached single family units proposed for that area. Due to the proximity of residences, indirect or secondary impacts are likely to result as well.

Historic Resources in the Phases 1 Area

Locus 2H. This resource lies entirely outside the Phase 1 area and would not suffer direct impacts during Phase 1. However, it may suffer secondary impacts.

Locus 4H. This resource lies entirely outside the Phase 1 area and would not suffer direct impacts during Phase 1. However, it may suffer secondary impacts.

Locus 9H. Portions of the standing structures of the existing Oak Flats Ranch are threatened directly by construction of proposed single family dwellings

and Salado Creek Golf Course, and potentially by preparation of Oak Flats Historic Park. Removal of existing buildings, grading, etc. within the park may impact potentially significant resources and buildings. Indirect secondary impacts may result as well.

Locus 10H/11H/12H. This resource would probably suffer direct impacts resulting from construction of the 9th and 10th holes of the proposed Salado Creek Golf Course in that area.

Locus 18H. The location of a potential resource would be potentially threatened directly by construction of attached single family dwellings and golf course features proposed for the area.

Archaeological Resources in the Phases 2 through 4 Areas

Because construction plans for the Phases 2 through 4 Areas are not presently available, resource-specific potential impacts on the archaeological sites within these areas cannot be specifically ascertained. However, Loci 29, 30, 31, 32, 33, 34, 35 and 35H would all probably suffer direct and/or indirect impacts resulting from the widening of Oak Flat Road in the Entry Road Area. Furthermore, with the construction of the Phase 1 Area, potential secondary impacts to all cultural resources in the Phases 2 through 4 Areas can be expected. These secondary impacts would result from the increased access and growth of residents in the project area.

When construction plans are made for the Phases 2 through 4 Areas, attempts should be made to avoid the identified cultural resources. Of particular concern in this regard would be the avoidance of prehistoric occupational sites with midden deposits (particularly loci 25 and 44) and important historical sites. The important historical sites will be more clearly defined when the results of Dr. Julien's historical research are added to this report. Additional information concerning the relative importance of the prehistoric occupational sites with midden deposits will also be added to this report when site testing and formal site recording are conducted. At the level of our present knowledge, it can be stated that loci 25 and 44 are the richest and most intensively occupied habitation sites in the Villages 2 through 5 Areas.

Mitigation Measures

Overall Site

1. The surface reconnaissance of the Phase 2 through 4 Areas should be completed by examining those potential resources identified in archival research but not found during the surface reconnaissance of 1992.

2. Prior to construction, complete evaluation of resources within the Phases 2 through 4 Areas potentially impacted by construction should be undertaken, so that more complete and appropriate mitigation measures may be formulated for the resources in question. A program of subsurface testing must be formulated and implemented to better evaluate the character, constituents, size, and depth of the deposits at each prehistoric resource. This should consist of at least two to three hand-excavated one-meter by two-meter test units at each site. The purpose of the hand excavation of test units is to collect information in a controlled manner on the depth, constituents, and stratigraphy of each site to better evaluate them as archaeological resources. Results of the test excavations must be analyzed and presented in a report of findings with recommendations for mitigation of the resources.

   Of particular concern in this regard would be the avoidance of prehistoric occupation sites, particularly Loci 25 and 44 and the more important historic sites. An architectural historian should also evaluate standing structures at the identified loci at that time as well. Buried midden may be present at some or all of the seed processing sites that lack obvious surface midden indicators. Therefore, subsurface augering or testing of these sites should be undertaken well in advance of plans' formulation for the relevant areas of Phases 2 through 4 to determine if midden is present. Although Loci 25, 44 and 3(CA-STA-274/H appear to be the richest of the prehistoric occupation sites in the Phases 2 through 4 Areas, further research at other sites, including those now listed without midden deposit may increase the number of such rich, very significant prehistoric resources.

3. To the extent feasible, the applicant should implement the following strategies to minimize impacts:

   a) redesign portions the project to avoid direct impacts;
   b) cover prehistoric resources and sensitive portions of historic resources with one to two or more feet of fill to protect the resource;
   c) build on the fill cover with no excavation below the fill deposit;
   d) monitor all construction in covered or uncovered sensitive areas; and
   e) Implement surface collection of significant data prior to construction, covering with fill, or other impacts.

   In the event direct impacts to a resource are unavoidable, further data collection may be warranted, depending on the results of the test excavation evaluation. A monitoring program must be formulated and implemented during construction or other impact-producing activities at these sites.

4. The local community of Northern Yokuts should be contacted by the EIR consultant and the applicant to alert them of potential threats to

both burial sites and probable ceremonial features such as pictographs and cupule rocks. Input from the Northern Yokuts on treating potentially disturbed burials in Locus 7 should be obtained.

5. A monitoring program should be formulated prior to construction and implemented for all historic resources within the Phases 2 through 4 Areas. All standing historic structures in Phases 2 through 4 shall be preserved or otherwise treated as recommended by the architectural historian.

6. All prehistoric and historic sites identified in surface reconnaissance and archival rsdearch should be formally recorded on site record forms and trinomial site designations obtained from the Central California Information Center at Stanislaus State University in Turlock.

Phase 1 Area

7. Locus 7 (CA-Sta-33)

   a. Access to rock shelters where pictographs are present should be closed off with iron grills fitted with gates. Keys or combinations should be available only to the applicant, their representatives, and access limited to members of the archaeological community, Native American community, and closely supervised educational groups.

   b. Although slated for inclusion and "protection" in Indian Rocks Park, potential direct and secondary impacts are likely. Serious consideration should be given to redesignating the site and its immediate vicinity to an undisturbed, open space status. Ideally, it would be permitted to revert to a natural vegetation community with no signage or other source of attracting attention. Any planned educational use of the site could be reduced and reassigned to other prehistoric features not impacted by construction within the Phase 1 area, or those sites outside the Phase 1 area. These might include Locus 1, 2, or 3, or another of those as yet unidentified elsewhere in the remaining project area.

   c. If public access to the Park must be part of the project plan, then all aspects of the General Recommendations discussed above must be applied to this site. These include surface collection, test excavation, covering of the site with sterile fill, and revegetation with native grasses or plants. Plantings of introduced plants and lawn are less desirable but acceptable alternatives. Any subsurface trenching below the fill deposits should be avoided. Subsurface disturbance for any reason should be monitored by an archaeologist.

Test excavation of one to two, one-meter by two-meter test units has been recommended in Locus 7 to provide data on that site as a record prior to any future impacts. The data would also serve as a comparative sample in discussing and evaluating the remaining prehistoric midden sites in the Phase 1 Area and elsewhere in the project area.

d. Periodic inspection of the site by an archaeologist or other trained full-time project inspector. Any human remains or artifacts brought up by rodents should be reburied immediately where found. This procedure should be maintained in perpetuity.

8. Locus 9H

a. All standing historic structures at the Oak Flats Ranch shall be preserved or otherwise treated as recommended by the architectural historian.

Entry Road Area

9. Holman & Associates' preliminary recommendation concerning the historic cultural resource loci 47H and 48H is that the resources be formally recorded utilizing methodologies consistent with those used to record the cultural resources in the Phase 1 Area.

F. PUBLIC SERVICES AND UTILITIES

Introduction

The project area would require extensive infrastructure improvements. Bookman-Edmonston Engineering, Inc. drafted a Utilities Master Plan to determine the location, capacity, and estimated cost of the facilities required to serve the project (Bookman-Edmonston Engineering, Inc., October 1991). The Master Plan is designed to coincide with the 25-year phased development of the project. More detailed plans are available for Phase 1. Analysis of water demand, wastewater generation, and solid waste generation were based on land use and dwelling unit designations presented in the Draft Specific Plan. The proposed project also would require additional facilities, staff, and equipment to provide adequate fire and police protection, schools, and parks and recreation areas. Land and office space would be provided in the town center for a Community Service District (or other form) for management and operation of Diablo Grande. The Public Facilities Plan is shown in Figure III.D-2. Throughout this section reference is made to the proposed Lakeborough project because certain service and utility requirements of the project and Lakeborough overlap. Because approval of the Lakeborough project is uncertain, consideration is given as to how to mitigate potential services impacts of Diablo Grande both with or without Lakeborough.

Water Supply

Setting

Overall Site

An analysis of the on-site groundwater potential in the greater Phase 1 area (i.e., 4,600 acres surrounding Phase 1) was conducted by Richard C. Slade, Consulting Groundwater Geologist, in October 1989. Due to the lack of substantial alluvial aquifers on the site, it was projected that the rest of the site would have a very limited supply of groundwater (Slade, 1989).

Phase 1 of the project site is within the service area of the recently formed Western Hills Water District. The next closest water districts are the Oak Flat, Orestimba, and Sunflower water districts. The Oak Flat Water District obtains water from the California Aqueduct through a contract with the California Department of Water Resources (DWR). The Orestimba and Sunflower water districts receive water from the Delta-Mendota Canal under contract with the U.S. Bureau of Reclamation (USBR) (Bill Harrison, pers. comm.).

Phase 1

The Phase 1 groundwater study reported that a few wells and water tanks are located on the site serving domestic and livestock purposes (Slade, 1989).

Existing wells in the area are located in the alluvial sediments associated with Salado Creek. Most of these wells are shallow (30 to 50 feet) and produce only a few gallons per minute (gpm) for stock watering. During drought periods some of these wells may become dry. A "good" well in the region was reported to have a depth of approximately 150 feet and to have flow rates of 12 gpm and as high as 30 to 50 gpm. The lower part of the Panoche Formation beneath the property contains approximately 4,200 to 8,500 acre-feet of groundwater. Approximately 725 acre-feet of water are available annually on the Phase 1 site and from areas tributary to that site (total of about 4,600 acres).

Potential Impacts

Overall Site

Supply. The project's water supply system will involve any one or a number of the following: offsite groundwater, water purchases and exchanges, participation in water conservation projects with other water districts in exchange for water saved; utilization of wastewater effluent, both onsite and acquired offsite; development of groundwater storage facilities in Madera County; utilization of the California Aqueduct and Delta-Mendota Canal for exchange deliveries; and playing an active role in the existing trading network among California water districts south of the Delta.

Bookman-Edmonston Engineering, Inc. prepared, on behalf of the City of Patterson, a "Reconnaissance Evaluation of Ground Water Resources Available to the City of Patterson" ("the Patterson Study") dated August 1991 (see Appendix E). This report concludes the valley floor in an around the City of Patterson has recharge in excess of potential demands. The report finds the recharge could support the projected 20-year growth for the City of Patterson and an additional 15-20,000 acre-feet per year of groundwater withdrawal without creating a groundwater imbalance (Bookman-Edmonston Engineering, Inc., May 27, 1992). The Patterson Study has been included in the Technical Appendix to this document.

Diablo Grande has acquired two agricultural properties encompassing about 310 acres in the Salado Water District (the Marshall Davis property south of Patterson) within the area included in the Patterson Study. These lands have both surface and ground water supplies. One or more wells would be developed on these properties (the "Well Sites"). Pipelines would be constructed from the Well Sites to the project. As needed, water treatment facilities would be constructed to treat groundwater piped from the Well Sites. The impacts of these facilities would include short-term geologic, noise, and dust impacts related to trenching.

The well site properties are currently irrigated with groundwater from existing on-site wells and with surface water from the Delta-Mendota Canal by allocation through the Salado Water District. Groundwater in an amount

equivalent to reasonable net irrigation use, about 1,100 to 1,200 acre-feet annually, would be pumped to supply the first five years of development of Phase 1 of the project[1]. Total pumpage during the first five years would be less than 5,000 acre-feet. Surface water entitlements from the Delta-Mendota Canal, which average up to about 1,100 acre-feet annually, would continue to be used for farming. A small amount of groundwater (25 to 50 acre-feet per year) would be used for the nursery for plants and trees for Diablo Grande landscaping.

Groundwater levels in nearby wells on properties adjoining the well sites would be monitored. While it is not anticipated that there would be any increase in the pumping heads (decrease in groundwater levels) on neighboring wells, if pumping heads are significantly increased by pumping from the well sites for the five-year buildout, the suface water entitlements for the properties could be made available to the impacted well owners. Low-water using crops would then be grown on the well site properties to compensate for the reduced water availability.

Prior to developing any portion of Diablo Grande beyond the five-year buildout, Diablo Grande and/or Western Hills Water District would need to acquire water supplies from one or more sources to meet the demand for additional developments. This water could be delivered via the California Aqueduct, Delta-Mendota Canal, or possibly new facilities. About two-thirds of the demand at full development, about 12,900 acre-feet annually, would be used for irrigation of golf courses and horticulture, and the balance would be used for potable purposes.

The applicant proposes to deliver directly to Diablo Grande by pipeline from the Canal or Aqueduct with potable water treatment at Diablo Grande or, alternatively, to irrigation districts in the area around the City of Patterson. The districts and farmers could then reduce their groundwater pumping. This would allow Western Hills Water District to pump an equivalent amount of groundwater which would require less treatment for potable purposes than would be required for canal water. Alternatively, a raw water pipeline and a potable water pipeline could be constructed to Diablo Grande and about one-third of the water supply could be exchanged for groundwater.

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[1]The first five years of buildout would include the following:

a) The golf club;
b) The Oak Flat 18-hole golf course;
c) The winery and 40 acres of vineyards;
d) Up to 200 single family units, or fewer units and the hotel conference center;
e) The maintenance center; and
f) The swim and tennis center.

Effects on groundwater levels caused by pumping from the well sites to Diablo Grande for development of the five-year buildout would not likely be significant. Pumping for Diablo Grande would not be likely to cause subsidence. Monitoring would be required to determine if mitigation is necessary. There would not be any significant change in groundwater quality due to pumping from the well sites to Diablo Grande.

Western Hills Water District is evaluating options to buy surplus water and treated wastewater effluent for delivery to and use for irrigation in lieu of groundwater pumping in the Patterson area. Such in lieu groundwater recharge would further assure the adequacy, particularly in dry years, of the local water supplies and groundwater for Diablo Grande.

Joint studies are currently underway with Metropolitan Water District of Southern California to develop a groundwater storage facility in Madera County underneath 13,600 acres, which is presently a dewatered aquifer that Diablo Grande has acquired rights to develop. Ability to exchange purchased water south of the Delta would allow Western Hills Water District along and in combination with other Central Valley Water Districts to acquire and store water to utilize in exchange for California Aqueduct water from a turnout near Oak Flat Road.

Purchased and exchanged water, which requires storage for subsequent use, would be wheeled through the California Aqueduct and the Delta-Mendota Canal to Mendota Pool on the San Joaquin River. This water would be wheeled principally in the non-irrigation season when capacity is available. A two-way canal with pumping stations would be constructed to convey water from Mendota Pool to recharge basins on Madera Ranch. These basins would have wide berms between them to provide habitat for wildlife. Groundwater levels in the area of the Ranch would be raised during recharge operations and lowered during withdrawal operations.

When Metropolitan needs water it would be pumped from groundwater storage and returned to Mendota Pool during times when local districts are diverting from the Pool. This would allow the Bureau of Reclamation to reduce deliveries to the pool and a like amount of water would be pumped from the Delta-Mendota Canal into O'Neill Forebay and the California Aqueduct for delivery to Metropolitan.

Diablo Grande would receive a seasonally regulated share of Metropolitan's water from the California Aqueduct at a new turnout near Oak Flat Road. From the turnout, raw water would be pumped up Oak Flat Road to Diablo Grande by Western Hills Water District.

If all of the storage capacity of Madera Ranch is not required for regulation of Metropolitan's water, Western Hills would seek to acquire and regulate additional supplies for Metropolitan or other entities. The Madera Ranch groundwater project would require CEQA environmental review upon its formal proposal.

Diablo Grande is investigating several options for purchasing water in the Sacramento Valley and the San Joaquin Valley. One option is the purchase of water surplus to local needs in Yuba County. Discussions were opened with the Yuba County Water Agency in 1990. Yuba River water released from New Bullards Bar Reservoir would be pumped from the Delta into the California Aqueduct. Other purchases might be exchanged with entities which receive water through the California Aqueduct.

Demand. The proposed project would use potable and non-potable water. Water demands are summarized in Table IV.F-A: Estimated Water Use. The average daily water demand would be about 11.5 million gallons per day (mgd), or 13,000 acre-feet per year (AF/yr). The maximum daily demand would be about 26.7 mgd. Approximately one-third of the water would be used for potable uses and two-thirds for irrigation. The majority of potable water deliveries would be to residential or commercial uses. The golf courses, polo center, creekways, and parks would receive primarily a blend of raw and reclaimed water.

Potable water would be used for indoor and outdoor uses in residential and commercial areas. Average daily potable water demand was estimated using a water use factor of 275 gallons per capita per day (gpcd) for the residential and service housing and 80 gallons per employee per day (gped) was assumed for the research campus, resort facilities, and commercial areas. The average daily demand for potable water for residential and commercial uses in the entire project is estimated to be 3.7 mgd. The maximum daily demand would be 8.2 mgd.

Non-potable water demand was estimated using a water use factor of 6.0 acre-feet per acre per year for the golf courses, parks, creekways, and the equestrian center. A water use factor of 3.4 acre-feet per acre per year was assumed for the vineyards and 10.0 acre-feet per acre per year was assumed for the plant nursery. The average daily water demand for non-potable water for the entire project will be approximately 7.7 mgd. The maximum daily demand for non-potable water would be 18.5 mgd (Table IV.F-A). Approximately 14 percent of the non-potable water supply would be derived from reclaimed water. This percentage reflects the maximum amount of reclaimed water which could be obtained from on-site wastewater facilities (80 percent of the waste water flow is reclaimable). The entire irrigation demand of the project could be satisfied by the raw water supply if the reclaimed water is temporarily unsuitable for irrigation.

Table IV.F-A - Estimated Water Use

Village	Land Use	Village Area (acres)	Population (3)	Employees	Unit Water Use (gpcd)	Unit Water Use (gped)	Unit Water Use (AF/ac/yr)	Average Daily Demand (gpd)	Maximum Daily Demand (1) (gpd)
Oak Flat (Phase 1)	Residential	685	5,150		275			1,416,300	3,115,860 (p)
	Commercial	93		1,320		80		105,600	137,280 (p)
	Open Space(2)	579					6.0	3,101,400	7,443,360 (i)
Oak Flat (Phase 2)	Residential	1,400	620		275			170,500	375,100 (p)
Copper Mountain	Residential	1,950	1,240		275			341,000	750,200 (p)
	Open Space	60					6.0	321,400	771,360 (i)
Indian Rocks	Residential	1,586	1,240		275			341,000	750,200 (p)
	Commercial	4		68		80		5,400	7,020 (p)
	Open Space	430					6.0	2,303,300	5,527,920 (i)
Crow Creek	Residential	3,100	2,820		275			775,500	1,706,100 (p)
	Commercial	7		119		80		9,500	12,350 (p)
	Open Space	240					6.0	1,285,600	3,085,440 (i)
Orestimba	Residential	2,205	2,260		275			621,500	1,367,300 (p)
	Commercial	4		68		80		5,400	7,020 (p)
	Open Space	130					6.0	696,300	1,671,120 (i)
TOTALS		12,473	13,330	1,575				11,499,700	26,727,630
(AF/yr)								12,881	N/A

Notes: (1) Maximum Day Use = Average Day Use x Peaking Factor

Water Use	Peaking Factor
Residential	2.2
Commercial	1.3
Open Space	2.4 (3.36 used for vineyards)

(2) Open Space includes golf courses, parks, creekways, vineyards, the swim and tennis club, and the equestrian center. Hill Area Preserves not included.

(3) This is a worst-case projection that may be reduced on the basis of updated market projections (ERA, November 1991).

(gpcd) = gallons per capita per day
(gped) = gallons per employee per day
(p) = potable
(i) = irrigation (raw/reclaimed)

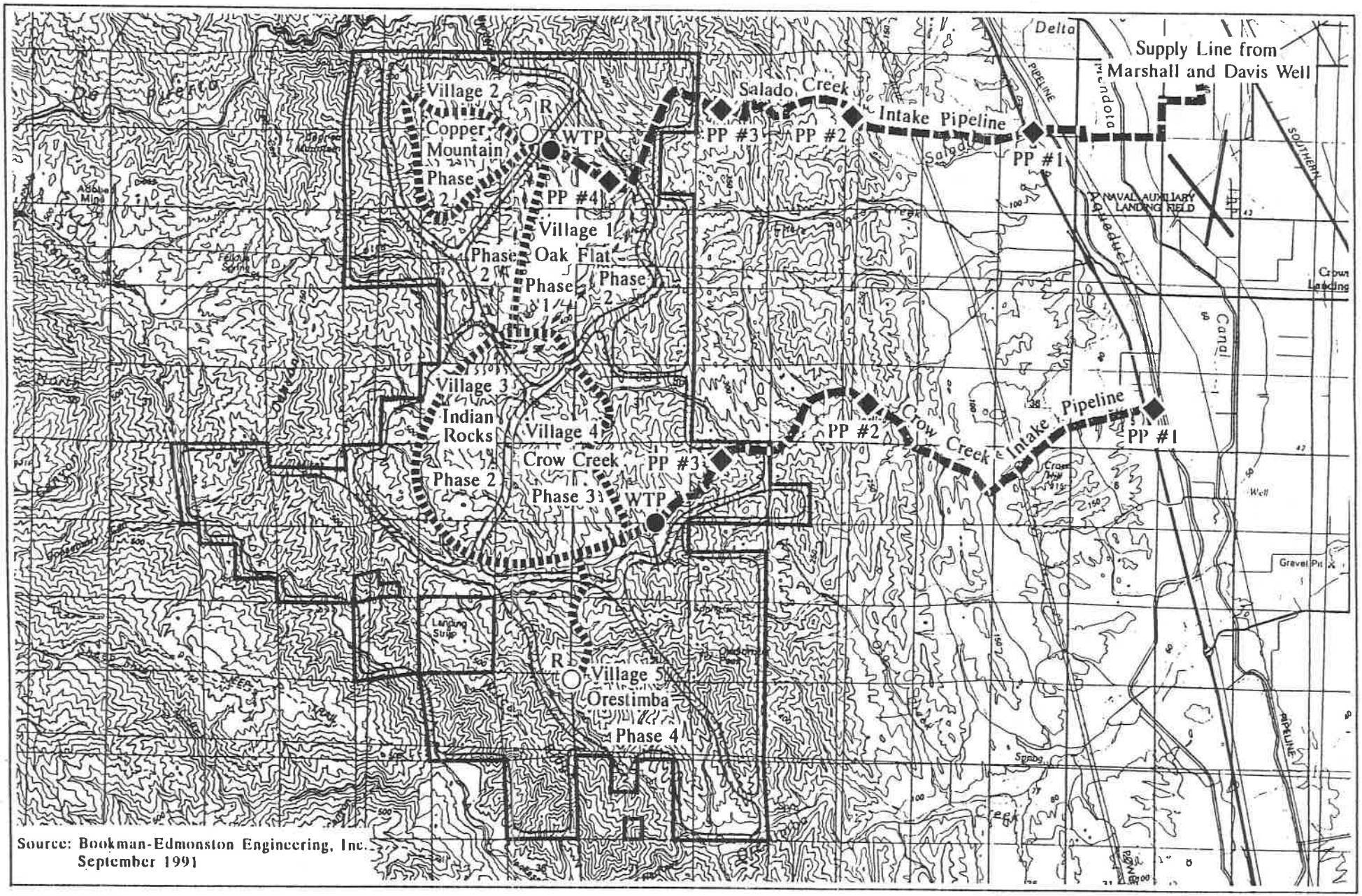
Distribution System. Raw water for potable and non-potable uses would be diverted from the Aqueduct at two locations. Pumping facilities on the Aqueduct, in-line booster pumps, and pressure pipelines would convey the water to the site. The Salado Creek Intake would generally follow the alignment of Oak Flat Road and Salado Creek, and would serve primarily Phases 1 and 2. It would have an ultimate capacity of 18.9 mgd (29.2 cfs). Four pumping facilities would be installed along the Salado Creek Intake to pump raw water from the aqueduct to the site. The interim water supply from the well sites would require a well-head booster pumping plant and approximately three miles of pipeline to a connection with the permanent pipeline from the Aqueduct. The Crow Creek Intake would generally follow the alignment of Crow Creek, and would serve Phases 3 and 4 and a portion of Phase 2. It would have a design capacity of 7.8 mgd (12.1 cfs). Three pumping facilities would be installed along the Crow Creek Intake. These intake pipelines would terminate at their respective water treatment facilities, the Salado Creek Filtration Plant and the Crow Creek Filtration Plant.

The conceptual raw water and backbone potable water system for the entire project is shown in Figure IV.F-1. Potable water transmission lines would be looped together to minimize disruptions due to intentional or accidental interruption of service. Treated water would be supplied from the plant with available capacity.

The Salado Creek Intake Pipeline would branch in three directions in the northern portion of Oak Flat Village, east of pumping plant number 4. One branch would deliver raw water to the irrigation system serving Oak Flat Village and Indian Rocks Village, and another branch would deliver raw water to the water treatment plant. The third branch from the Salado Creek Intake would deliver raw water in a line with a design capacity of 1.2 cubic feet per second (cfs) to meet irrigation demands in Copper Mountain Village. Raw water delivered during the day through the Salado Creek Intake would be stored in ponds on the golf courses and in steel tanks. Water would be applied at night, drawing from the ponds, tanks, and intake pipeline. The development and operation of the Crow Creek Intake would be coordinated with the proposed Lakeborough development.

Treatment Plants. The nominal ultimate capacity of the Salado Creek Filtration Plant would be 5.1 mgd. The Crow Creek Filtration Plant would have a nominal ultimate capacity of 3.1 mgd. Initial plant construction for Phase 3 would include two process streams, each rated at 1.0 mgd. A third process stream of 1.1 mgd is planned for Phase 4.

The proposed water treatment plants would be designed to conform with current American Water Works Association (AWWA) standards. The levels of treatment would be in compliance with the California Department of Health Services (DOHS) requirements. Turbidity reduction would be the primary water treatment needed because turbidity can interfere with disinfection and/or maintenance of chlorine residual. Both treatment facilities would be



Source: Bookman-Edmonston Engineering, Inc.
September 1991

12-02-91 (STC102)

LEGEND

- Raw Water
- Potable Water
- WTP Water Treatment Pl
- PP Pumping Plant
- R Reservoir Study Area

N

LS

Scale in Miles

0 2.5 5

Figure IV.F-1

Project Site Wat ystem

conventional filtration plants. Chlorine and potassium permanganate would be used as bactericides, to provide an initial pathogen kill and to maintain a chlorine residual level required by the DOHS.

Primary treatment would consist of rapid mixing, flocculation, and sedimentation. Filtration facilities would include a gravity filtration structure, mixed-media filters, back wash and surface wash systems, and a wash water surge tank. The primary disposal product of the water treatment process is alum sludge. Approximately 16,000 tons per year of alum sludge would produced by the project and would be landfilled off-site. Ancillary facilities at the treatment plant would include in-plant pumping of raw and treated water, an administrative building, a laboratory, and a maintenance building. Clear well storage would be provided at the treatment plants. This storage would attenuate mismatches between the treatment plant and distribution system demand and provide distribution storage for the low and middle pressure zones of the Phase 1 potable water delivery system.

There are no plans for the distribution of reclaimed water to the entire site; there are plans for Phase 1. Reclaimed water may be used for irrigation or if there is no demand for irrigation, it may be released to each of the creeks on which the plants are constructed.

Conclusion. Adequate supply, distribution system and treatment plants are planned to meet the demands of the proposed project. According to the preliminary Patterson Study, the local aquifers can generally supply the project's water demands without overdraft of the basin. This supply could, however, adversely affect nearby wells, seasonal aquifer water levels, and cumulative impacts on groundwater. Additional studies would be necessary to determine the extent of these potential impacts.

Phase 1

Demand. During the first 18 months of the project, the water usage would be less than 500 AF with very little potable water supplied to the site. In the period from 18 months to three years, the water usage would be less than 1,150 AFY. During the period of three to five years, water usage would not exceed 1,200 AFY. The Phase 1 development average daily water demand would require 4.6 mgd or 5,000 AFY. The maximum daily demand, which would be met from on-site storage, would be 10.7 mgd. The maximum daily demand for non-potable water would be 7.4 mgd, of which 1.1 mgd would be from reclaimed water.

Distribution System. Preliminary layouts of the potable and non-potable water systems have been prepared for Phase 1. These are shown in Figure IV.F-2: Phase 1 Potable Water System, and Figure IV.F-3: Phase 1 Irrigation System.

Distribution of raw water to these systems is described in the section about the water distribution system for the overall site.

Within the Phase 1 development of Oak Flat Village a 33- to 42-inch raw water pipeline with a design capacity (based on the maximum daily non-potable water demand; minimum pressure at each turnout of 20 psi) of 46 cubic feet per second (cfs) would run along the eastern edge of the village for about 2.7 miles. In addition, a pipeline of six to 18 inches with a design capacity of eight cfs would run along the western portion of the Oak Flat Village.

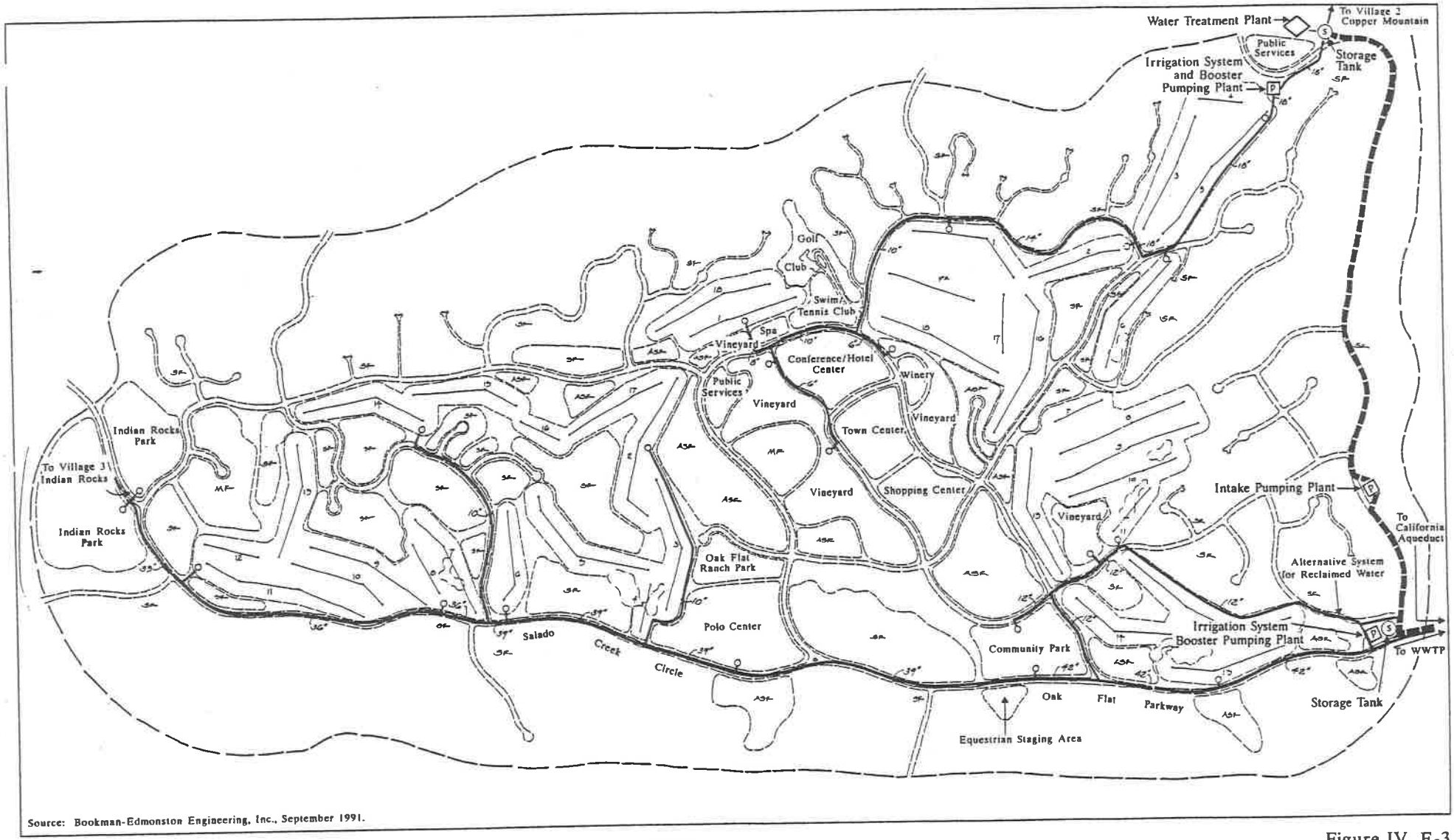
There are three pressure zones within Phase 1 for the potable water system (Figure IV.F-2). The hydraulic grade lines of the pressure zones are shown in Table IV.F-B. There would be an elevation differential between 115 and 125 feet for each pressure zone. Pressure zones would overlap by 15 to 25 feet. The High Zone would be supplied from a 1.3-million-gallon steel tank located on the hill southwest of the Salado Creek Filtration Plant. The High Zone Reservoir would be filled by an 18-inch pipeline and booster pump drawing water from the water treatment plant clear well. The middle and low zones would be supplied directly by gravity from the clear well. The clear well would be a steel reinforced concrete structure with a storage volume of 5.6 million gallons. Table IV.F-C shows the potable water distribution reservoir requirements.

The backbone of the Oak Flat Village potable water distribution would be an 18-inch pipeline from the clear well of the Salado Creek Water Treatment Plant through the village and ending at the border of the Indian Rocks Village. This pipeline is shown in Figure IV.F-1.

Reclaimed water would be discharged from the Salado Creek Wastewater Treatment Plant and be conveyed in a 12-inch line for two miles along Oak Flat Road to the northeastern portion of the Oak Flat Golf Course. The design capacity of this line would be nominally 3.0 cfs. The reclaimed water distribution line for Phase 1 is shown in Figure VI.F-3: Irrigation System.

Treatment Plant. Phase 1 would be served by the Salado Creek Filtration Plant. That plant is discussed above, with regard to the overall site. The Phase 1 development would produce approximately 6,300 tons per year of alum sludge.

Conclusion. The Well Sites provide assured water supply for only the amount of development planned for the first three to four years of Phase 1. The preliminary Patterson Study indicates that the remaining six to seven years of the Phase 1 development have a possible source, but additional study is necessary to determine if this source would result in seasonal or cumulative impacts on the aquifer, or on other local wells. The distribution system and treatment plant are designed to meet the needs of Phase 1.



Source: Bookman-Edmonston Engineering, Inc., September 1991.

11-27-91(STC102)

N

LSA

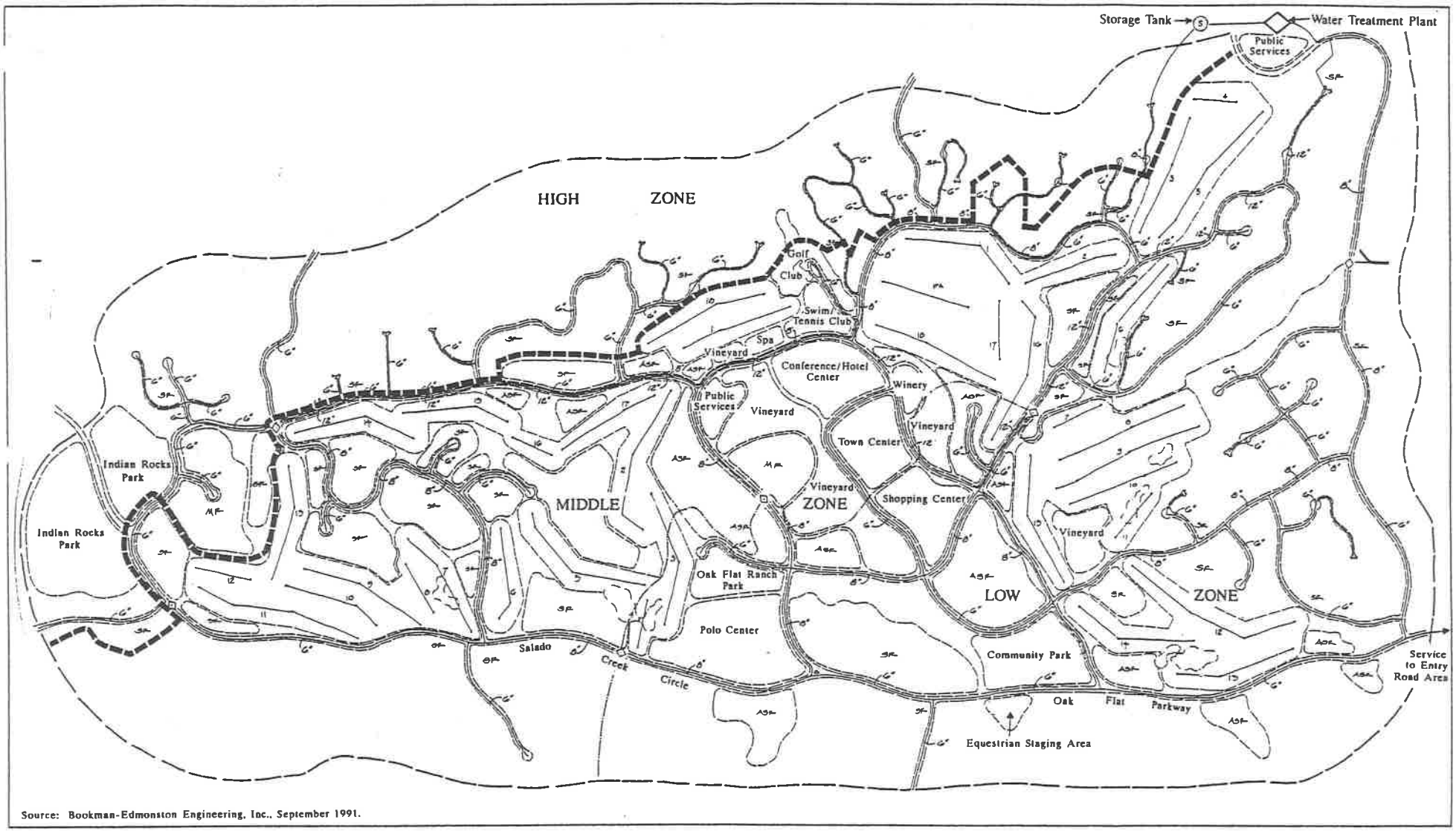
Scale in Feet
0 450 900

LEGEND

- Intake Pipeline
- Irrigation Pipeline
- Irrigation System Delivery Location

Figure IV. F-3

Phase 1 Irrigation System



Source: Bookman-Edmonston Engineering, Inc., September 1991.

11-27-91(STC102)

N

LSA

Scale in Feet
0 450 900

LEGEND
- Pipeline
- ◇ Pressure Reducing Valve
- Zone Boundary

Figure IV. F-2

Phase 1 Potable Water System

Table IV.F-B - Oak Flat Village (Phase 1)
Pressure Zones
Hydraulic Grade Lines and Water Demands

	Minimum Hydraulic Grade Line	Average Daily Demand	Maximum Daily Demand
	(Elevation in feet)	(Millions gallons per day)	
Low Zone	1,390	479,700	1,001,400
Middle Zone	1,265	729,100	1,552,200
High Zone	1,115	313,100	699,500
Oak Flats Total		1,521,900	3,253,100

Table IV.F-C - Oak Flat Village Potable Water Storage Requirements (Million Gallons)

	Emergency Storage	Regulatory Storage	Fire Storage	Total Storage
Low Zone	1,001,000	350,000	1,080,000	2,431,000
Middle Zone	1,552,000	543,000	1,080,000	3,175,000
High Zone	700,000	245,000	360,000	1,305,000
Oak Flat Total	3,253,000	1,138,000	2,520,000	6,911,000

Mitigation Measures

Overall Site

1. The long-term environmental impacts of the Yuba River water diversion and storage at Madera Ranch should be studied prior to approval of detailed supplies.

2. The applicant should establish a system of monitoring wells adequate to determine if the project would affect nearby wells. These could consist of existing wells. These wells should be monitored on a daily basis, and any correlation with pumping by Western Hills Water District for Diablo Grande should be noted. Monitoring wells should be established prior to operation of Western Hills Water District wells. Monitoring results should be provided monthly to the County Environmental Resources Deparment.

3. If groundwater levels at wells near the Western Hills Water District well sites decline by 10 percent or greater, and that decline can be reasonably correlated with increased pumping from the Western Hills Water District wells, Western Hills should offset increased pumping needs by allocating portions of their Salado Water District water allocations to the impacted neighboring owners.

4. Because long-term water supplies beyond the five-year buildout have not been assured, development requiring over 1,200 acre-feet per year of water shall not be permitted unless the applicant can show to the County's satisfaction that adequate water supplies have been made available, and that environmental impacts of those sources have been studied and mitigated per CEQA requirements.

5. Sludge produced by the water treatment plants should be properly contained, handled, and disposed of to avoid soil or groundwater contamination.

6. Water treatment plants should meet requirements of the Stanislaus County Department of Environmental Health, the American Water Works Association, and the California Department of Health Services.

7. The project applicant should demonstrate the project's conformance with County fire flow and water pressure requirements to the satisfaction of the West Stanislaus Fire Protection District and the County Fire Marshall. Required hydrant flows are specified in the recommended mitigation measures in the Fire Protection section for this EIR.

8. The project should be equipped with water conserving devices such as low-flow faucets, shower heads and toilets.

9. Drought-tolerant vegetation should be used in all landscaping to minimize irrigation requirements. The on-site nursery should specialize in native drought-tolerant species to ensure that replacement plantings maintain low irrigation requirements. Where possible, runoff should be channeled toward landscaped areas to further reduce the need for landscape watering and to promote groundwater recharge.

Phase 1

All mitigation measures above are applicable and no additional mitigation measures are required.

Sewage Disposal

Setting

The site has no wastewater collection or treatment services. Although septic systems are currently used on the site, the suitability of the site for septic systems is limited due to shallow sediments and the underlying bedrock near the surface. Most of the site is underlain by shaley rocks of the Panoche Formation, which have low permeability (Slade, 1989).

Potential Impacts

Overall Site

Currently, preliminary development plans are not available for Phases 2 through 4. Design concepts for the Overall Site are extrapolated from the Preliminary Development Plan for Phase 1. Reclaimed water may be used to irrigate golf courses and parks, or released directly into nearby creeks. The sewerage system would be designed to handle wastes from the entire site, including estates in the Conservation Areas. The sewerage treatment facilities and the disposition of treated wastewater would need to be investigated in project-level environmental review to determine their potential impacts on water quality and hydrology. These impacts could be significant.

Generation. Wastewater is assumed to be generated by return flows from indoor potable water uses. Storm drainage and return flows from non-potable uses are not treated. Average daily wastewater production was estimated using a wastewater flow rate of 100 gallons per day per capita for the residential and service housing areas. A wastewater flow rate of 80 gallons per day per employee was assumed for the research campus, resort facilities, and commercial areas. Maximum daily flow was estimated by increasing the average daily flow by a factor of 2.25 to account for daily variation. Wet weather peaking factors of 4.0 and 2.5 were applied to laterals and mains

respectively, to reflect infiltration. Approximately two mgd of wastewater would be produced by the entire project based on the average day, and 3.3 in the maximum day.

Collection. No details are available for the collection system for Phase 2 through 4. Refer to the description below the Phase 1 collection system for an example of how the system for the overall site will be designed.

Treatment Plants. Sewerage treatment facilities would be provided on-site. The facilities would reclaim wastewater for irrigation to the maximum amount practicable. Eighty percent of the wastewater is reclaimable. The treatment facilities would be conventional waste-activated sludge plants (secondary treatment), with the addition of tertiary filtration to meet more stringent reclaimed water reuse standards. The treatment facilities and effluent would meet the requirements of Title 22, Division 4 of the California Administrative Code, the California DOHS, and the RWQCB).

Three wastewater treatment plants would be used. Plant locations are proposed so that all flow to the wastewater treatment facilities would be by gravity. The plants would be located along Salado Creek, Crow Creek, and Orestimba Creek and serve their respective drainage basins. The nominal capacity of Salado Creek Wastewater Facility would be about 1.9 mgd. Initial plant capacity would be about 1.4 mgd to serve Phase 1. The ultimate capacities of the Crow Creek and Orestimba Creek wastewater facilities would be about 0.9 mgd and 0.5 mgd, respectively. Phased construction is not planned for these plants, and due to the low flow rates, package plants may be used. The capacity is equal to estimated maximum day wastewater production. Mismatches between system production and treatment plant flow rate would be attenuated in retention ponds as set forth in Title 22. Reclaimed water also may be released to the creeks adjacent to the treatment plants if there is no concurrent irrigation demand. This could be considered a significant water quality impact unless mitigated.

Phase 1

Generation. Phase 1 development would produce 0.6 mgd of wastewater under average daily conditions. Under maximum daily conditions Phase 1 development would produce 1.4 mgd.

Collection. A wastewater plan has been developed for Phase 1. The plan includes criteria and assumptions used to determine the load on the wastewater system as well as layout, sizes and costs associated with the preliminary design of the wastewater system.

Currently, Stanislaus County does not have published criteria for the design of wastewater systems. Therefore, design criteria for the wastewater systems were developed using a combination of site-specific factors, established design criteria from other municipalities, and standard engineering practices.

The wastewater system would be divided into four zones determined by the topography of the site, as shown on Figure IV.F-4. Zone One would be comprised of single family residences and would be about 23 percent of the total flow for Phase 1. This would include the estimated flow from the future development of Copper Mountain during the development of Phase 2. Zone Two would be comprised of single family, attached/single-family, and commercial areas. Flow from this zone would be about 35 percent of the total flow estimated for Phase 1. Zone Three would be comprised of single-family and attached single-family and multiple-family areas. This zone would contribute about 24 percent of the total flow estimated for Phase 1. Zone Four would be comprised of single family, attached single family, and multiple-family areas. This zone would provide about 18 percent of the total flow estimated for Phase 1. The flow for Zone Four would include the estimated flow for the development of the Phase 2 portions of Oak Flat Village and 100 dwelling units in Indian Rocks Village.

The components of the wastewater collection system would include lateral and main conduits, fittings and manholes (Figure IV.F-4). Pipe sizes range from eight to 14 inches in diameter. Sewer lines would generally be located within the street right-of-way. Exceptions to this would be in areas where it is necessary to locate pipes across golf courses or between housing lots.

Treatment Plants. The Salado Creek Wastewater Facility would treat wastewater from Phase 1 development. The facility is designed to meet the estimated maximum day conditions for Phase 1.

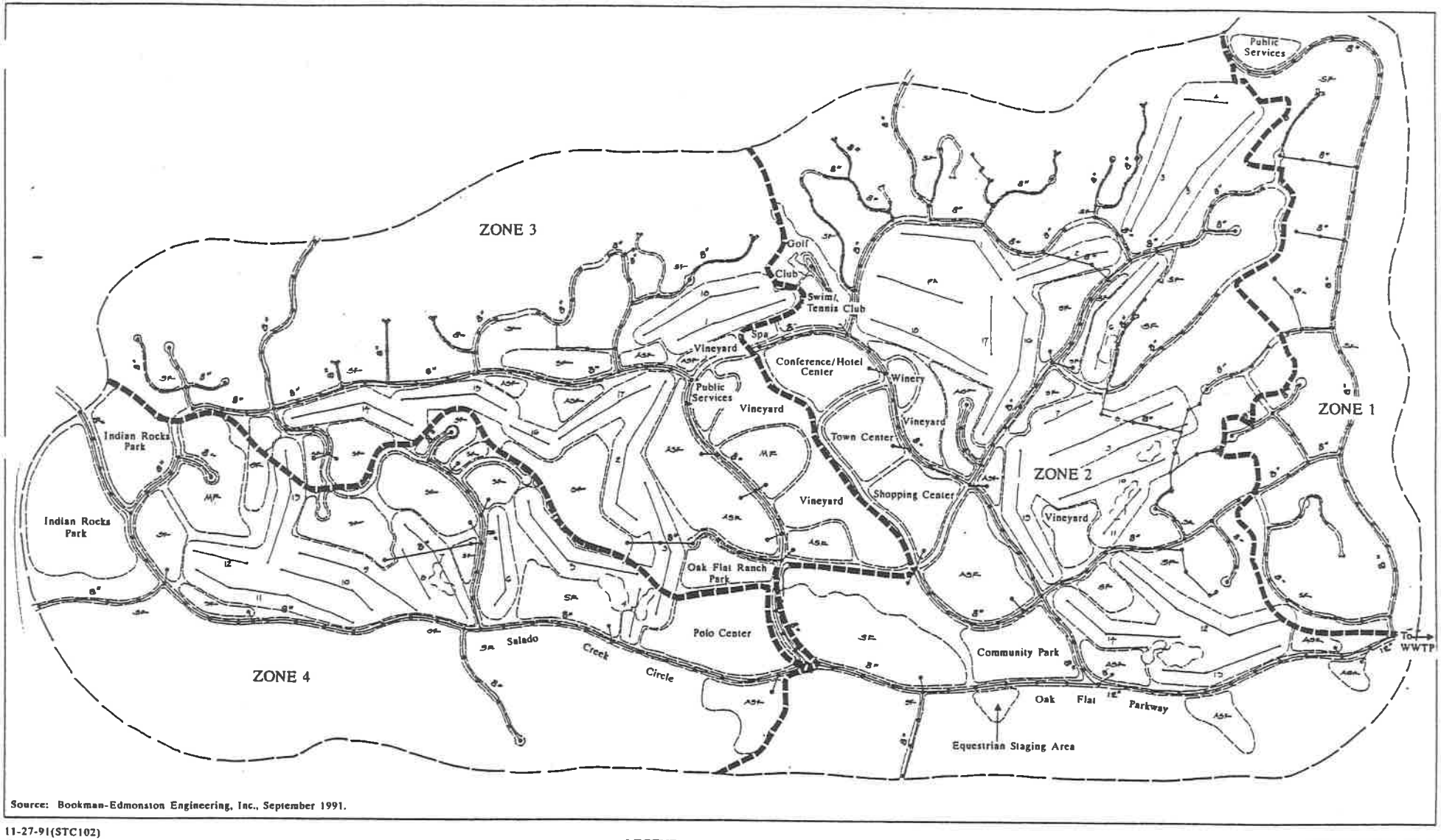
Mitigation Measures

Overall Site

1. Reclaimed water used for irrigation should be monitored to ensure that it meets the requirements of the California DOHS and the RWQCB.

2. Prior to discharge of excess reclaimed water into the creeks, the Stanislaus County Department of Environmental Health, California DOHS, and RWQCB should confirm that no deleterious impacts would occur as a result of this release.

3. A services district shall be formed to provide the sewer service (or sewer service shall be provided by the Western Hills Water District).



Source: Bookman-Edmonston Engineering, Inc., September 1991.

11-27-91(STC102)

LEGEND

- Manhole
- Sewer Pipeline
- Zone Boundary

LSA

Scale in Feet

0 450 900

Figure IV. F-4

Phase 1 Sewage System

Phase 1

All mitigation measures above are applicable and no additional mitigation measures are required.

Solid Waste

Setting

Overall Site

Solid waste from the project site would be hauled to the Fink Road Landfill and Waste-to-Energy (WTE) facility by Bertolotti Disposal Service. Under a recent County ordinance all new non-agricultural uses must contract with a disposal service to pick up garbage and recyclables at the curbside. Recyclables would be taken to the transfer station at Flamingo Road for distribution to recycling centers (Michele Sackman, pers. comm.).

Under the County's Integrated Waste Management Plan, currently 24.4 percent of the County's solid waste is landfilled, 50.6 percent is incinerated, and 25 percent is recycled. The Stanislaus County Waste Stream Analysis 1990-2020 estimates that approximately 47 percent of the waste produced in 2010 will be diverted, recycled or reduced at the point of origin. The Integrated Waste Management Act of 1989 (AB 939) requires that each city and county achieve a 25 percent reduction in the amount of waste landfilled by the year 1995 and a 50 percent reduction by 2000. It further requires that each city and county prepare a Source Reduction and Recycling Element (SRRE). Stanislaus County is in the process of preparing the SRRE for the cities and for the unincorporated areas of the County. The Draft SRRE is to be completed and submitted to the California Integrated Waste Management Board in late 1991 (Jamie Aggers, pers. comm.). Discrepancies between the County's existing Integrated Waste Management Plan and AB 939 should be resolved in the Draft SRRE.

The Fink Road Landfill was opened in 1973 and is 219 acres. The landfill is divided into several uses: a Class III landfill, Class II landfill, and a WTE facility. The Class III landfill handles general garage, refuse, and non-hazardous materials, while the Class II landfill is used for the disposal of ash from the WTE plant and similar materials with more restrictive disposal requirements (Western Ecological Services Company, Inc., May 1990).

A 100-acre expansion of the Class III landfill is approved and scheduled to be in operation in 1992. The design capacity of the landfill expansion is three million tons. It is estimated that the Fink Road Landfill has a remaining capacity of 3.2 million tons and can accept solid waste county-wide for approximately 20 years (Western Ecological Services Company, Inc., May 1990). This assumes that diversion program goals under the Integrated Waste

Management Act of 1989 (AB939) are met, and annual waste stream growth does not exceed the county's 3.5 percent projection.

The WTE Facility is the only such plant operating in the County. It is operating under a 30-year contract to dispose of 243,000 tons of waste per year until the year 2016 (LSA Associates, Inc., September 25, 1990). At present, the plant is operating at capacity, which is 800 tons/day between May and October and 725 tons/day between November and April or 292,000 tons/year. The remaining capacity at the ash landfill is 2,822,000 tons or 32 years of WTE facility operation. Approximately 127,750 tons/year is recyclable (Perkins/White, September 3, 1991).

Phase 1

Currently, waste from the existing Oak Flats Ranch is self-hauled to the Fink Road landfill. The discussion above for the overall site applies to Phase 1.

Potential Impacts

Overall Site

Solid waste generation calculations for the project are based on data from a similar community, Morgan Hill, California located in the Coyote Valley area of Southern Santa Clara County. Diablo Grande is assumed to have similar demographics to those in Morgan Hill based on the similarity of land uses including residences, office parks, town centers, parks, wineries, vineyards, and town center. The project waste stream would represent approximately 30 percent of the total increase in the County waste stream at the end of Phase 1, and 37 percent at full buildout.

The residential and commercial uses in the project would generate approximately 22,000 tons per year of solid wastes at build out[2]. In addition, sludge from the water treatment plant and the wastewater treatment plant would be landfilled. The water treatment plant would generate 16,000 tons per year of alum sludge at build out. The wastewater treatment plant would generate 30,000 tons per year of sludge at build out (Mark Salmon, pers. comm.). Therefore, total solid wastes from the project would be about 68,000 tons/year. This would comprise about 13 percent of the waste disposed of by the County in the build out year, according to waste projections in the Stanislaus County Wastestream Analysis 1990-2020. If the wastewater sludge

[2]The estimate is based on a population of 12,850, with the first year of residential development of Phase 1 being 1994. Choosing a different starting year or different projected total (13,330 elsewhere in this EIR) would change waste projections an insignificant amount. The buildout year is 2018 (Mark Salmon, December 4, 1991).

could be disposed of in a method other than landfilling (i.e., composting), Diablo Grande's contribution to County solid waste would be reduced to slightly over seven percent.

AB 939 assigns the responsibility for achieving waste diversion goals to local government. The SRREs being prepared by cities and counties require various segments within a locale to achieve waste reductions to aid in meeting area-wide goals. It is possible that Diablo Grande would be given the responsibility for reducing its own waste. Therefore, it may establish programs to collect recyclables at the curbside, separate recyclables from the mixed waste at a central material recovery facility, and compost yard waste.

Phase 1

The Phase 1 development would generate approximately 5,100 tons per year of solid waste from residential and commercial uses[3]. Sludge from the water treatment plant and the wastewater treatment plant would be landfilled. The water treatment plant would generate 6,300 tons per year of sludge, and the wastewater treatment plant would generate 16,400 tons per year of sludge in Phase 1. Therefore, total solid wastes from Phase 1 would be about 31,600 tons/year. This would comprise about 19 percent of the waste disposed of in the County in the Phase 1 buildout year, according to projections in the Stanislaus County Wastestream Analysis.

According to estimates provided by the Stanislaus County Department of Public Works, adequate capacity is available at the Fink Road landfill expansion to serve the residential and commercial uses of the project through the end of Phase 1.

Mitigation Measures

Overall Site

1. The project should conform to provisions of the County SRRE to reduce the amount of waste that is landfilled. Curbside pickup of recyclables or a collection facility for recyclables should be provided within the development.

2. When the Fink Road Landfill is nearing capacity, studies should be conducted for later phases of development to determine whether a countywide or private on-site landfill would be required to accommodate the proposed project. Environmental impacts of any such landfill would need to be assessed.

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[3]This assumes a worst-case population of 6,425 at the end of Phase 1 (prior to updated November 1991 market surveys).

3. Composting and land application of sludge from the wastewater treatment plants should be investigated for later phases of the development.

Phase 1

Refer to measure #1.

Fire Protection

Setting

Overall Site

The site is within the West Stanislaus Fire Protection District (WSFPD), which extends from the San Joaquin River to the Santa Clara County line. The site is in an area of relatively high fire hazard for wildland fires. The closest fire station to the site is located in Patterson, approximately 3.5 miles from the intersection of Ward Avenue and Oak Flat Road. The Patterson Station has three engines, a water tender, and a rescue/salvage vehicle. In addition, the Patterson Station has a stationary breathing air compressor for self contained breathing apparatus tanks. The present staffing is approximately 39 volunteer fire fighters. This level of staffing is minimally adequate for current fire protection. Response time from the Patterson Station to the Oak Flat Ranch is 25 minutes (Richard Gaiser, October 1991).

The Crows Landing Station provides back-up service, with a response time of 27 minutes. This station is approximately five miles from the Ward Avenue/Oak Flat Road intersection. It has one engine and a water tender (Richard Gaiser, October 1991). In the summer, the California Department of Forestry (CDF) assists the District with non-structural fires. The CDF is located on Sperry Road in Patterson (Joe Hughes, pers. comm.).

Phase 1

The discussion above for the overall site is applicable to Phase 1 and the Access Roadway.

Potential Impacts

Overall Site

Due to the long response time from the existing fire stations, all initial fire, rescue, and medical operations would have to be provided on-site to provide response in the first several minutes. Adequate fire protection can be defined

as a fire station within 1.5 miles for all areas where improvements exist or will exist. As many as three or four fire stations may be needed to adequately cover the response areas of the project (Richard Gaiser, October 1991). The availability of facilities in Lakeborough may reduce the number of stations required. Each fire station would require one engine and a salvage/rescue vehicle or brush unit. At least four personnel would be needed with each engine at all times. Eighteen to 20 line personnel for each engine company would be required for 24-hour service, seven days a week. Additional personnel would be required if an aerial apparatus was required. Additional clerical, training, and support personnel would also be needed (Richard Gaiser, October 1991). The project proposes a helistop for emergency medical use. The helistop would improve response time. Three access roads to Interstate 5 are proposed.

The CDF would retain primary responsibility during the summer for wildland fire protection after the project is implemented. It is possible that the State Board of Forestry would remove the developed areas from State Responsibility Area designation, thereby eliminating CDF control.

Two-way radio coverage for police, fire, and local government/public works may be difficult because the dispatch tower is located in the shadow of the West Side Hills. Two-way communication is essential for emergency response.

In accordance with the Draft Specific Plan, the following fire protection policies would be adhered to with project development:

- Roofs would be made of tile, asphalt shingle, or treated wood shingles.
- Commercial development would be provided with internal sprinkler systems.
- Landscape buffer zones would be provided between development and existing grasslands and woodlands.
- Back-lighted street numbers would be provided on residential dwellings.

The location of development of the scale of the project at the proposed site, which is a remote, high fire hazard area, is a significant impact. However, the fire hazard can be mitigated to below a level of significance with the inclusion of fire protection policies of the Draft Specific Plan and the requirements and recommendations of the WSFPD and the EIR consultants.

Phase 1

The project applicant proposes to construct a fire station in Phase 1. The WSFPD ascertains that one fire station would be adequate to service Phase 1 for emergency medical aids and minor fires. The WSFPD recommends that initially, the Phase 1 fire station have at least two engines and a rescue/salvage vehicle. As additional stations are put into service, one of the engine companies may be moved from the Phase 1 station to a more remote station.

Phase 1 would require 40 fire fighting personnel for the two engines plus administrative staff (Richard Gaiser, October, 1991). The Phase 1 development would present a significant impact with regard to fire hazard. As stated for the overall project, the impact can be mitigated to below a level of significance.

Mitigation Measures

Overall Site

The following mitigation measures are required or recommended by the WSFPD:

1. Hydrant spacing should not exceed 500 feet in residential areas and 300 feet in commercial/industrial areas.

2. Hydrant flows should be a minimum of 1,000 gallons per minute in residential areas and 2,500 gallons per minute in multiple residential, commercial, and industrial areas.

   The project proponent should pay the applicable Capital Facilities Fees to cover facilities and equipment which are not provided on-site by the project proponent.

3. Depending on the level of service required, an annual benefit assessment fee may be needed to cover expenses of day-to-day operations of the WSFPD. This will be determined through discussions between the project proponent and the WSFPD.

4. Automatic fire sprinklers should be installed in commercial buildings. The WSFPD also recommends the fire sprinklers be installed in the residences, which may reduce the personnel required to provide fire protection to the site.

5. To provide adequate two-way communication for emergency response vehicles, a communication system should be retrofitted on the existing equipment and another should be placed on an additional tower overlooking the site (at Mike's Peak).

The following mitigation measures are recommended by this EIR:

6. Road widths, road grades, and turnaround radii should be adequate for emergency equipment.

7. Wildfire fuel reduction prescriptions should be adhered to as outlined in the Land Use section of this EIR.

Phase 1

All mitigation measures above are applicable and no additional mitigation measures are required.

Police Protection

Setting

Overall Site

The County Sheriff's Department is responsible for responding to criminal offenses and the California Highway Patrol is responsible for responding to traffic offenses in the project area.

A patrol officer from the Sheriff's Department in Modesto is assigned to the site vicinity. The current response time to the site is approximately one hour from headquarters and is considered to be inadequate. However, the patrol car could respond in 15 minutes if on Interstate 5 (Pat Glattke, October 1991). In an emergency, back-up service could be provided by any other station in the vicinity, such as Patterson, through a mutual aid agreement maintained by all incorporated cities in the County (Pat Glattke, October 1991). The Sheriff's Department is currently understaffed (Dave Richards, pers. comm.).

A minimum of one unit from the California Highway Patrol is assigned to Interstate 5 at all times. The CHP does not patrol the site, but is responsible for investigation of motor vehicle accidents involving injuries, hit and run, or driving under the influence (Ken Brandt, pers. comm.). Because the one unit also handles the unincorporated areas near Interstate 5, it is often unavailable due to accident investigations. Occasionally the area is patrolled by air during daylight hours. The airplane is stationed in Fresno. The Highway Patrol in Modesto is near capacity (John Stearman, pers. comm.).

Phase 1

The discussion above for the overall site is applicable to Phase 1 and the Access Roadway.

Potential Impacts

Overall Site

The project would add substantially to the demand for police services on the site. A Sheriff's station site is proposed to be located in the town center unless the proposed Sheriff's station in Lakeborough is built first.

Additionally, the project would have its own private patrol services to augment County protection.

Personnel and vehicles required to meet the demand for police protection by each phase of the development of the proposed project were recommended by the Sheriff's Department are shown in Table IV.F-D. The substation should be a minimum of 5,600 square feet and include storage space and an employee break room. Adequate parking would also be needed.

The project proposes a helistop for emergency medical use. The helistop would improve response time. Three access roads to Interstate 5 are proposed.

Two-way radio coverage for police, fire, medical, and local government/public works may be difficult because the dispatch tower is located in the shadow of the West Side Hills.

In accordance with the Draft Specific Plan, back-lighted street numbers would be provided on residential dwellings.

The impact on police services would be below a level of significance provided that security provisions of the Draft Specific Plan and recommendations of the Sheriff's Department and the EIR consultants are included in the project.

Phase 1

The Phase 1 development would require additional police staff, equipment, and facilities than is currently available. The project applicant proposes to construct a police station as part of the public safety center for the Phase 1 development. The impact would be below a level of significance provided that the station includes, as recommended by the Sheriff's Department, eight deputies and detectives, one sergeant, two support staff members, and three vehicles (Pat Glattke, October 1991).

Mitigation Measures

Overall Site

The following mitigation measures are recommended by the Stanislaus County Sheriff's Department:

1. Access roads should be year-round all weather roads with access to Interstate 5.

2. A study should be conducted to determine what equipment would provide proper communications.

Table IV.F-D - Estimated Demand for Police Personnel and Equipment

	Cum. Pop.	Empl.	Cum. Deputies and Detectives[1]	Sergeants[2]	Lieutenants[3]	Support Staff[4]	Vehicles
Phase 1	5,150	1,320	8	1	0	2	3
Phase 2	8,230	1,390	11	1	1	2	3
Phase 3	11,100	1,510	15	2	1	3	5
Phase 4	13,360	1,580	18	2	1	4	6

SOURCE: Pat Glatte, Stanislaus County Sheriff's Department, November 4, 1991.

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[1]Deputies and detectives are figured at 1.19 per thousand population.

[2]Sergeant ratio is 1:7 deputies/detectives.

[3]Lieutenant/station commander required for size of operation.

[4]Clerical ratio is 1:5 deputies/detectives.

The following additional mitigations are recommended by this EIR:

3. Access, lighting, and other crime prevention measures should be included as part of final development plans. Parking areas, pathways, and the common areas should be lighted to provide maximum visibility.

4. Residents who intend to incorporate alarm systems into their homes should, from the outset, be advised of Sheriff's Department and Communications Department policies and asked to consult with the representatives of these two departments prior to installation.

5. Road widths, road grades, and turnaround radii should be adequate for emergency equipment.

Phase 1

All mitigation measures above are applicable and no additional mitigation measures are required.

Medical

Setting

Overall Site

The site is within federally-designated Health Facilities Planning Area (HFPA) 511 (Modesto, Patterson, and Oakdale), and primarily within the more local boundaries of the Patterson Hospital District. The southern quarter of the site, which would include a portion of Village 5, is within the Westside Hospital District. There are six other hospitals in the HFPA 511, all of which are outside the Patterson Hospital District's boundaries. These hospitals are Doctors Medical Center (Modesto), Memorial Hospital (Modesto), Memorial Hospital (Ceres), Modesto City Hospital, Oak Valley Hospital (Oakdale), and Stanislaus Medical Center (Modesto). A study prepared for the Lakeborough EIR revealed that 78 percent of the patient days of residents from Patterson and Crows Landing were captured by hospitals within HFPA's 511, 509 (which includes Tracy), and 516 (which includes Turlock), while 22 percent were captured by the Patterson Hospital District (Western Ecological Services Company, Inc., May 1990).

The Patterson Hospital District operates the Del Puerto Hospital in Patterson and provides acute care, convalescent, and paramedic services. The hospital is licensed for 39 beds; the skilled nursing facility handles 18 beds. In addition, there are six perinatal and 19 medical/surgical beds (City of Patterson, April 1991).

Phase 1

The discussion above for the overall site is applicable to Phase 1.

Impacts

Overall Site

With the potential addition of project demand, with a population projection of up to 13,000, and Lakeborough, with a projected population over 28,000, it is possible that the Patterson Hospital District would expand its services and thereby attract more local residents. In addition, because most of the site is within the Patterson Hospital District and because Village 5 would be the last village to be built, the following discussion emphasizes the Patterson Hospital District.

The Patterson Hospital District estimates that the project would require 16 beds in a hospital (acute care) and 27 beds in a convalescent facility[4] (Del Puerto Hospital, June 12, 1991). A paramedic station would be built within the town center during Phase 1. The Patterson Hospital District recommends that the station be designed to house two Emergency Medical Service personnel, one or two ambulances, a small meeting room and an office for administration purposes (Thomas Lynn Avery, June 12, 1991).

The project proposes a helistop for emergency medical use. Three access roads to Interstate 5 are proposed.

Two-way radio coverage for police, fire, medical, and local government/public works may be difficult because the dispatch tower is located in the shadow of the West Side Hills. Until adequate medical services are assured, the project would cause a significant but mitigable impact (see Mitigations).

Phase 1

The Phase 1 development would require approximately six acute care hospital beds and 10 convalescent beds (Thomas Lynn Avery, June 12, 1991). The paramedic station would be built during Phase 1. These additional beds and paramedic station would have to be built prior to Phase 1 occupancy to reduce the impact to below a level of significance.

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[4]The demand for beds in an acute care hospital is estimated at 1.21 beds/1000 population. The demand for beds in a convalescent facility is estimated at 2.05 beds/1000 population.

Mitigation Measures

The following mitigation is proposed by the applicant:

1. Diablo Grande will make space available at its Public Safety Center for an emergency medical vehicle.

The following mitigations are recommended by the Patterson Hospital District:

Overall Site

2. A formal financing mechanism (i.e., special district) should be formed to extend for 40 years. Once the boundaries of the Hospital District vis-a-vis Village 5 have been determined, and a commercial/retail assessment mechanism determined, the final amount of the funding can be calculated.

3. If a special district is not formed, the project applicant should pay an appropriate developer fee to be determined in negotiations with the Patterson Hospital District and commensurate with Diablo Grande's impact on the District, or show to the County's satisfaction that other hospital facilities are adequate to meet the project's needs.

The following mitigation measures are recommended by the EIR:

4. Road widths, road grades, and turn-around radii should be adequate for emergency equipment.

Phase 1

All mitigation measures above are applicable to Phase 1 and no additional mitigation measures are required.

Public Schools

Setting

Overall Site

The site is located in the Newman-Crows Landing Unified School District. All of the schools are located in Newman, except Bonita Elementary School, which is located in Crows Landing. Table IV.F-E shows schools in the District and their enrollments and capacities. The enrollment at Von Renner Elementary School is growing the fastest, followed by Yolo Junior High School, both of which are currently over capacity. Under existing conditions (that is,

Table IV.F-E - School Enrollments and Capacities

School	Grade Level	Enrollment[1]	Capacity[2]	Percent of Capacity
Von Renner Elementary School	K-5	677	630	Over capacity
Bonita Elementary School	K-5	156	180	87
Yolo Junior High School	6-8	375	360	Over capacity
Orestimba High School	9-12	391	500	78

Source:

Edward Williams, Newman Crows Landing Unified School District, September 27, 1991.

City of Newman, General Plan Background Report, September 1990.

[1]Based on 1991-1992 school year.

[2]Based on 30 students per classroom; includes permanent and portable facilities.

excluding any proposed projects), average school growth is expected to be five to 10 percent per year (Edward Williams, pers. comm.). The District plans to purchase a new elementary school site in Newman. However, this may not occur until 1993. The proposed development of the Lakeborough project is expected to result in the construction of several elementary schools, one junior high school, and one high school. Students from the project area may attend these schools. Current District enrollment is approximately 1,600 students, serving a population of about 5,000 (Edward Williams, pers. comm.).

Phase 1

The discussion above for the overall site is applicable to Phase 1 and the Access Roadway.

Potential Impacts

Overall Site

The number of students which would be generated by the project is based on the number of housing units that would have school-age children. Therefore, retirement and seasonal housing are deducted from the total number of dwelling units, as shown in Table IV.F-F. The percentages of retirement and seasonal housing are based on a market study conducted by ERA for the project applicant (July 1991). These percentages have been approved by the County.

Based on the adjusted total of 3,100 units with school-age children and student generation factors provided by the Newman-Crows Landing Unified School District, the project would generate approximately 2,015 students in grades K-6 (factor of 0.65), 403 students in grades 7-8 (factor of 0.13), and 682 students in grades 9-12 (factor of 0.22). It should be noted that the school factors totaling one student per dwelling unit are high, and that the Newman-Crow's Landing Unified School District's consultant has used 0.71 students/unit on other developments. The State of California generally uses 0.7 students per dwelling unit. Using the total factor of 0.7 students per dwelling unit and similar grade distribution of students, the project would generate approximately 1,395 students in grades K-6 (factor of 0.45), 279 students in grades 7-8 (factor of 0.09), and 465 students in grades 9-12 (factor of 0.15), for a total of 2,139 students. This estimate may still be high because the attached single family residences and multiple family residences are likely to have less than 0.7 students per dwelling unit. In addition, due to the forecasted cost of the dwelling units in the project, it is likely that there would be fewer school-aged children per household. Proportionally, more high school students and less elementary school students would also be expected than in a conventional single-family development.

Table IV.F-F - Adjusted Total of Residences with School-Age Children
Overall Site

Dwelling Type	Percentage[1]	Number of Units
Detached Single-Family		2,940
Retirement Housing	23	680
Seasonal Housing	6	180
Adjusted Total		2,080
Attached Single-Family		1,010
Retirement Housing	33	330
Seasonal Housing	12	120
Adjusted Total		560
Multiple-Family		1,050
Retirement Housing	44	460
Seasonal Housing	12	130
Adjusted Total		460
Total Project		5,000
Adjusted Total		3,100

[1]Diablo Grande, Ltd. Percentages of seasonal and retirement housing are based on a market study prepared by ERA in July 1991. These types of housing would not generate school-age children and are, therefore, subtracted from the total number of units proposed for each dwelling type.

Students from the project could attend one of the seven elementary schools and the junior high school and the high school proposed by the Lakeborough project. If the Lakeborough project is not built prior to the project, one or two new elementary schools would be needed to accommodate the development at build-out. Students would be bussed to the Yolo Junior High School and the Orestimba High School (Edward Williams, pers. comm.). Because Yolo Junior High School is already functioning above its current capacity, the proposed project would present a significant impact. With the provision of funding or facilities this impact would be reduced to below a level of significance.

Phase 1

The Phase 1 development would generate approximately 802 students in grades K-6, 166 in grades 7-8, and 272 in grades 9-12, based on the same premises as stated above for the overall site (Table IV.F-G), and the Newman-Crows Landing Unified School District factor of one student per dwelling unit. Using the State of California factor of 0.7 students per dwelling unit, the Phase 1 development would generate approximately 556 students in grades K-6, 111 students in grades 7-8, and 185 in grades 9-12. An elementary school site would be designated outside Phase 1 in the Draft Specific Plan if it is determined that an elementary school is needed at buildout. However, as with the overall site, the proposed project would present a significant impact because the Yolo Junior High School is already functioning above its current capacity. With the provision of funding or facilities, this impact would be reduced to below a level of significance.

Mitigation Measures

Overall Site

1. Developers should pay the required fees per square foot for financing new school construction or should construct schools to the District's specifications. A developers' fee of $1.58 per square foot may not cover the full cost of school construction.

2. Additional financing, if needed, should be coordinated with the school districts to pay for new school facilities and services such as bussing.

3. The construction of new school facilities should be phased in accordance with the construction of Phases 1 through 4 of the proposed project.

Table IV.F-G - Adjusted Total of Residences with School-Age Children
Phase 1

Dwelling Type	Percentage[1]	Number of Units
Detached Single-Family		1,005[2]
Retirement Housing	23	230
Seasonal Housing	6	60
Adjusted Total		715
Attached Single-Family		595
Retirement Housing	33	195
Seasonal Housing	12	70
Adjusted Total		330
Multiple-Family		420
Retirement Housing	44	185
Seasonal Housing	12	50
Adjusted Total		185
Total Project		2,020
Adjusted Total		1,230

[1]Diablo Grande, Ltd. Percentages of seasonal and retirement housing are based on a market study prepared by ERA in July 1991. These types of housing would not generate students and are, therefore, subtracted from the total number of units proposed for each dwelling type.

[2]Includes 55 single-family units on Polo Center site to be developed later in Phase 1 (ERA, November 1991).

Phase 1

All mitigation measures above are applicable and no additional mitigation measures are required.

Parks and Recreation Service

Setting

Overall Site

There are no existing developed parks or recreation areas on the project site. A range of recreational activities are available in the project vicinity. Stanislaus County maintains parks totaling more than 10,000 acres. These parks provide picnic areas, sports fields, campsites, equestrian facilities, swimming, water skiing, fishing, boating, hunting, and off-road vehicle areas. Frank Raines County Park is located approximately three miles west of the northern boundary of the project site (see Figure IV.A-2). Other non-County maintained recreational facilities in the area include the 228-acre Turlock Lake State Park, the California Aqueduct Bikeway, a country club, a fisherman's club, gun clubs, and city parks (Stanislaus County, June 1987). The Army Corps of Engineers maintains parks along the Stanislaus River (Chain of Pearls).

Phase 1

There are no existing developed parks or recreation areas in Phase 1.

Potential Impacts

Overall Site

The Stanislaus County General Plan (June 1987) recommends that three acres of neighborhood parks should be provided for every 1,000 residents, or one acre per 333 residents. Therefore, 40 acres of neighborhood parks should be provided for the 11,920 residents of Diablo Grande. Neighborhood parks should be approximately seven acres, and should include play equipment, a basketball court, picnic facilities, and security lighting (County of Stanislaus, Parks and Facilities Department, 1986).

Community parks should be no less than 25 to 30 acres and located within two miles of the area that it serves. It should include the same facilities as the neighborhood park as well as restrooms, picnic shelters, free play area, softball fields, tennis courts, horseshoe courts, lighting, and onsite parking for 50 cars (County of Stanislaus, Parks and Facilities Department, 1986).

Parks should be sited in a central location, easily accessible to the population it is intended to serve. One larger park is preferable to several smaller parks (Bob Gregory, pers. comm.).

Proposed parks and recreation areas and facilities at the site include seven parks, six golf courses, a swim and tennis club, a polo center, an equestrian staging area, creekside and hillside trails. Parks and golf courses are shown on the Public Facilities Plan, Figure III.D-2. Proposed facilities are shown on the Preliminary Phase 1 Development Plan, Figure III.D-6, Riding and hiking trails are shown on Figure III.D-3, Circulation Plan. Acreages of open space and recreation areas are summarized in the Project Description of this EIR.

Parks and recreation areas (facilities not included) are summarized in the Project Description, Table III.D-D. They range in function from active recreation to passive creekside and hillside parks. All park areas would be owned and maintained by the Diablo Grande Community Service District. These areas are proposed to meet the requirements of Stanislaus County. However, it cannot be determined if they meet the specific acreage and facilities requirements because detailed plans for the parks are available for Phase 1 only.

The proposed seven parks would be located throughout the development as recommended by the Stanislaus County Parks and Facilities Department. They are, however, not centrally located with respect to the development area. In particular, the park in Village 5 is located along the southern project boundary (where flatter lands are available adjacent to other proposed facilities).

Outside of the Phase 1 development, recreational facilities proposed include four golf courses including two 18-hole courses in Village 3, one 18-hole course in Village 4, and a nine-hole course in Village 5 that may be expanded if additional level lands are acquired.

The trail system proposes peripheral and internal trails. Approximately 14 miles of peripheral riding and hiking trails are proposed primarily along the eastern portions of the project site in the Orestimba and Salado Conservation Areas. This would allow access to about 4,900 acres of Conservation Areas including Orestimba Peak, ridges with valley views and portions of Salado Creek. Approximately 18 miles of private riding and hiking trails are proposed to be used primarily by residents, guests and visitors. These internal trails would be located in the Copper Mountain and Wilcox Ridge Conservation Areas and provide links to the Salado and Orestimba Conservation Areas, allowing access to 12,700 acres of the major Conservation Areas.

Although the proposed project includes ample park lands and open space and recreational activities suited to the anticipated population, it does not specifically meet the requirements of the County for neighborhood and community parks. If the parks and recreation facilities are designed to suit the County, the impact would be reduced to below a level of significance.

Phase 1

Phase 1 would include approximately 435 acres of parks and recreation areas and facilities, including parks, golf courses, swim and tennis clubs, a polo center, and equestrian staging area.

A 15-acre community park would be located on the looped portion of Oak Flat Parkway, and would include Salado Creek. The area south of Salado Creek would have a combined soccer and baseball field, and the area north the creek would be used for free play areas, lawn areas, picnicking, and nature trails. In order to meet the criteria for community park recommended by Stanislaus County, the park would have to be expanded by ten to twenty acres and include tennis courts, horseshoe courts, lighting, and parking facilities.

However, the resort area includes a large number of recreational areas, including tennis courts, so that additional acreage or facilities should not be necessary.

The Oak Flats Ranch Park would encompass 10 acres and would include part of the historic ranch site along Salado Creek. The historic barn would be preserved as a historic and prehistoric information and crafts center. Picnicking and nature trail activities would be available.

The Indian Rocks Park would be located on approximately 53 acres, partially within Phase 1. It would include Salado Creek. The primary intent of this park would be for the preservation of prehistoric artifacts and sites of the Yokut Indians. Use of the park would be limited to picnicking, trails and educational signs in proximity to the roadway.

Although 84 acres of parks in the Phase 1 development is probably more than sufficient, no neighborhood parks, as defined by the Stanislaus County Parks and Facilities Department, would be provided. According to recommendations of the Department, 15 acres, or two neighborhood parks, should be provided, compared with the one proposed 15-acre community park.

Two golf courses would be located in the Phase 1 area. The Oak Flat Golf Course, a 7,100-yard, par-72 championship course, would be located in the eastern half of Phase 1. The Salado Creek Golf Course, a 6,600-yard, par-71 golf course, would be located west of the town center and partially adjacent to Salado Creek.

The swim and tennis club is proposed on four acres of land adjacent to the golf club and health spa.

The proposed winery would provide specialty shop and restaurant uses, and would host community music, art, and commercial recreation events.

The proposed polo center would be located on 21 acres between Salado Creek and the intersection of Oak Flat Parkway with Salado Creek Circle. It would

serve as an interim open space and recreation use during Phase 1 only. It would be converted to residential uses at the end of Phase 1.

As with the overall site, Phase 1 has parks and recreational activities to suit the needs of the anticipated population, but does not meet the County requirements for neighborhood and community parks. This can be mitigated to below a level of significance.

Mitigation Measures

Overall Site

The following mitigation measures are recommended by the Stanislaus County Parks and Facility Department (Bob Gregory, 1992):

1. Neighborhood parks shall be located within two to three blocks of the area they serve and shall be about seven acres.

2. Community parks shall be located within two and a half miles of the area they serve and shall be 25 to 30 acres.

3. Restrooms are recommended for neighborhood parks and required for community parks.

Phase 1

All mitigations above are applicable and no additional mitigation measures are required.

Gas and Electricity

Setting

Overall Site

Pacific Gas and Electric Company (PG&E) would provide gas and electric services to the proposed project site. The closest gas lines to the project site are located east of Interstate 5 east of the California Aqueduct off of Fink Road. Major electrical lines are located west of Interstate 5 near the Fink Road Landfill. Permits and/or easements for natural gas facilities would be required from Stan Pac, Caltrans, Stanislaus County, and the State of California. Gas and electric extensions must be in accordance with standard tariffs of the California Public Utilities Commission (CPUC) (Marsial Fernandez, PG&E, 1990).

Phase 1

The discussion above for the overall site is applicable to Phase 1.

Potential Impacts

Overall site

Electric and gas lines would have to be extended throughout the site. Specific plans for the entire site, and energy consumption estimates are not available. This project is expected to consume substantial energy for various uses. To reduce impacts to below a level of significance, utilities shall be provided in accordance with the phases of development.

Phase 1

Phase 1 of the proposed project would generate a peak electrical load of about 11,000 kilowatts (4,700 of which is associated with the Salado Creek Intake pumping plants). According to PG&E representatives, a load of this magnitude would require expansion of an existing PG&E substation located just west of the California Aqueduct on Oak Flat Road. Alternatively, a new substation would be constructed about two miles west of the existing substation where a high voltage PG&E line crosses Oak Flat Road. PG&E would prepare a detailed study to evaluate which of these alternatives is the least costly. Up to seven miles of 12-kilowatt overhead power line would be constructed from the expanded or new substation to the project site. The power line would roughly parallel Oak Flat Road within the road right-of-way.

Natural gas service would be provided at the project site by means of the construction of a pressure regulation station at PG&E's high-pressure gas main located just east of and parallel to the California Aqueduct. Seven miles of eight-inch steel gas pipeline would be constructed from the regulation station to the site within the Oak Flat Road right-of-way. Phase 1 would not create a significant impact because adequate supplies of electricity and gas are available and the project proposes extensions and facilities to supply it.

Mitigation Measures

Overall Site

1. The project proponent shall be financially responsible for expansion of facilities and extensions.

2. Residences shall be positioned to reduce energy use.

Phase 1

The mitigation measure above is applicable and no additional mitigation measures are required.

Communications

Overall Site

The project area would be serviced by Evans Telephone Company. At this time there are a few scattered lines in the area extending from Oak Flat Road and Del Puerto Canyon Road (Linda Reding, Evans Telephone Company, 1990).

Cable television service would be provided to the project by Televents of Los Banos, California.

Phase 1

The discussion above for the overall site is applicable to Phase 1.

Potential Impacts

Overall Site

Evans Telephone Company have indicated that initial telephone service could be provided by microwave link between the site and their system on the valley floor. Once loads increase, a buried fiberoptic line would be constructed between the site and the valley floor, approximately seven miles away.

A television cable would be constructed on the overhead power line to be constructed along Oak Flat Road.

The project would provide extensions and facilities to provide service. Therefore, it does not present a significant impact.

Phase 1

The discussion above for the overall site is applicable to Phase 1.

Mitigation Measure

Overall Site

1. The project proponent shall be financially responsible for expansion of facilities and extensions.

Phase 1

The mitigation measure above is applicable and no additional mitigation measures are required.

G. VISUAL RESOURCES

Introduction

Visual resources and visual quality are terms used to describe subjective human perceptions of visual stimuli. Because of their subjective nature, visual resources are difficult to quantify. Definitive and universally applicable visual quality standards are not available by which to measure visual conditions and project impacts. Nevertheless, visual quality issues are important environmental concerns subject to CEQA evaluation. The approach used to prepare this visual resource evaluation is based on a three part process, as described below.

First, the existing visual resources are evaluated based on scenic quality (including landforms, vegetation, adjacent scenery) and the distance from which the site is viewed.

Second, viewsheds are evaluated for their sensitivity to potential modifications. Generally, these include areas considered to be very sensitive where none to very little activity would be allowed, less sensitive areas where some changes are acceptable, and insensitive areas where higher levels of change could be allowed to occur.

Third, visual impacts are determined based on the following contrasting changes to form, line, value and hue:

- Contrast in form would result from changes in the shape and mass of landforms or structures. The degree of change would depend on how dissimilar the introduced forms are compared to the natural forms in the landscape.
- Contrast in line would result from changes and interruptions of edges, bands, and silhouette lines; new lines may differ in their elements (boldness, complexity, and orientation) from existing lines.
- Changes in colors (i.e. value and hue) would tend to create the greatest contrast; other factors such as chroma, reflectivity, color temperature, may also increase the contrast. Noticeable contrast in texture would usually stem from differences in grain and density; other factors such as irregularity and directional patterns of texture are also considered.

Setting

On July 11, 1991, and June 10, 1992, LSA's environmental planner toured the project site and photographed the site from 33 viewpoints on or near the site's network of existing roadway. Location and direction of viewpoints are indicated on a topographic map in Figure IV.G-1: "Key to Photographs of Oak Flat Road and Primary Access Road" and Figure IV.G-2: "Key to Photographs

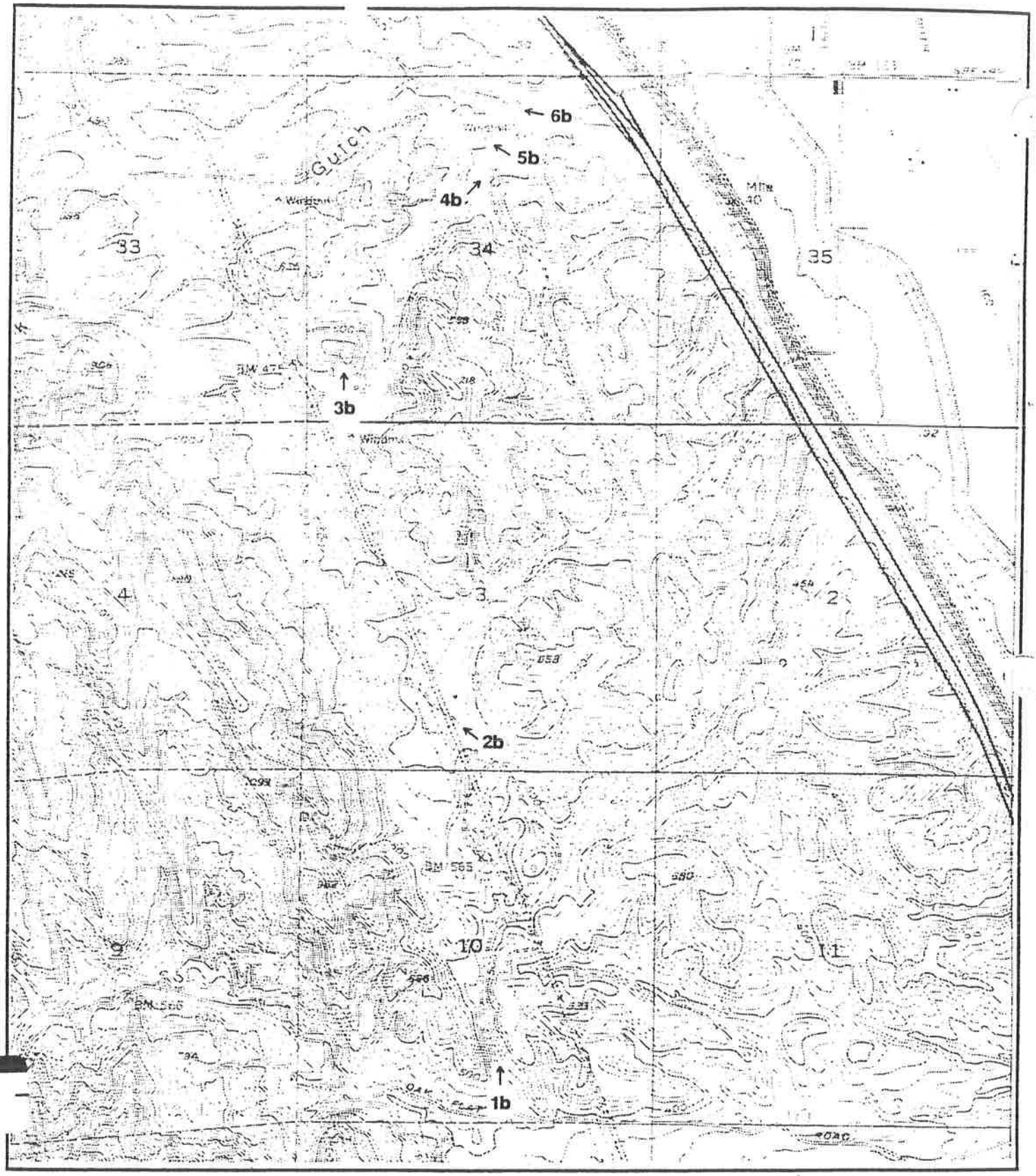

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Figure IV.G-1

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LSA

Scale in feet

0 2000

Key to Photographs of
Oak Flat Road and Primary Access Road

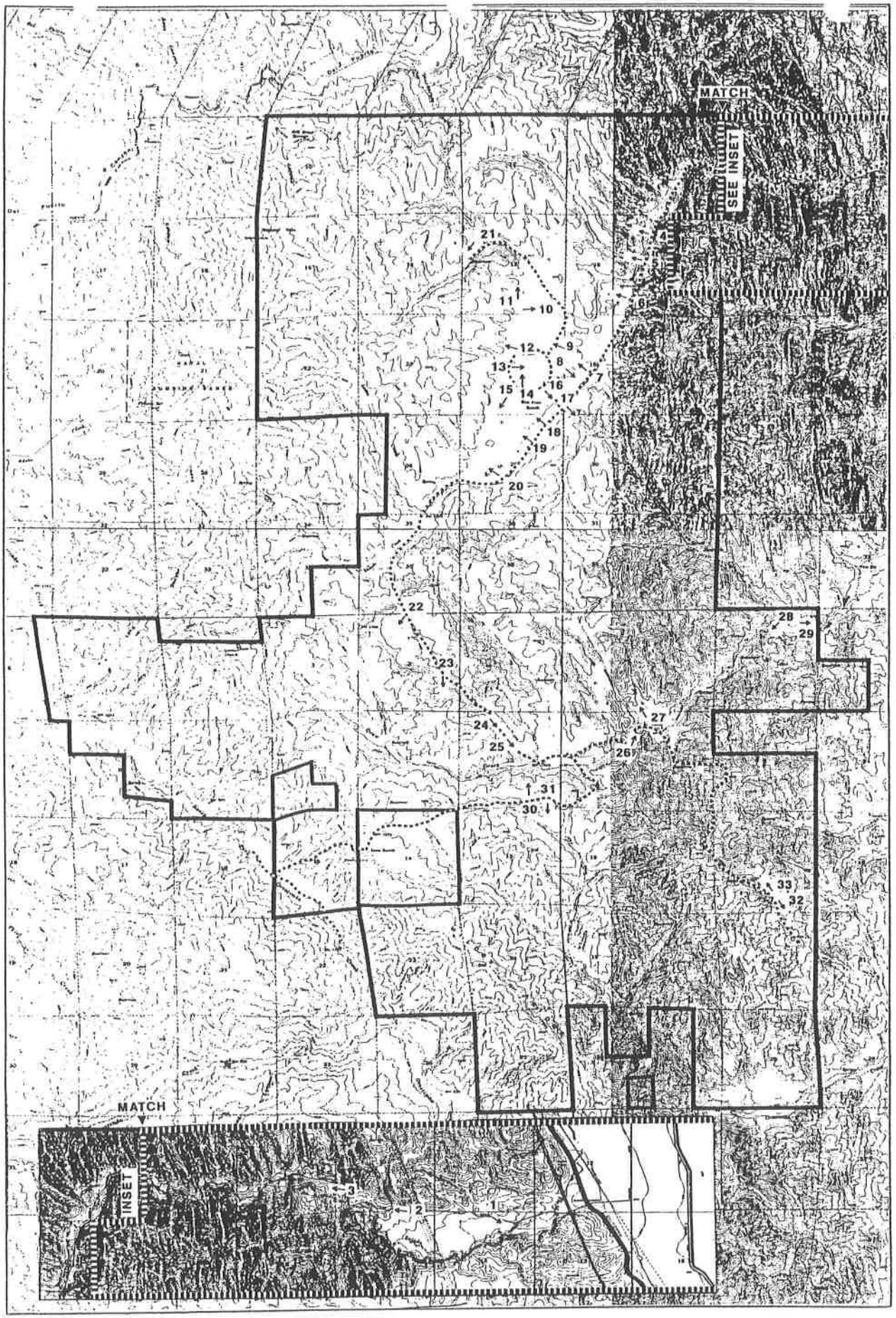

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Figure IV.G-2

←1 Location of Photographer and Direction of Photographic View.

N

LSA

Scale in miles

of Phase 1 and Overall Site". Both figures are keyed to the photographs that are introduced in the discussion below.

Phase 1 Site

Views from Oak Flat Road

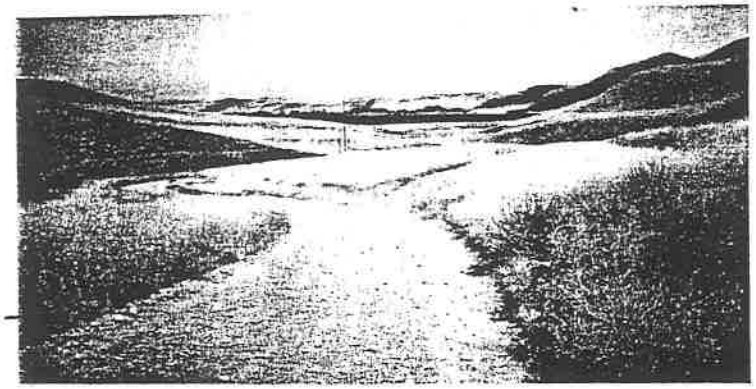
Phase 1 includes the 100-foot right-of-way (ROW) of the Oak Flat Road corridor west of I-5. The corridor is approximately nine miles long, extending east-west from Ward Avenue to the Village 1 entry. It is County-maintained, except for the eastern-most 3.5-mile segment which is a private road on the project site. Figure IV.G-3: "Photographs of Oak Flat Road Views" shows four views from Oak Flat Road.

From I-5, Oak Flat Road winds along Salado Creek at the eastern side of the valley. The east-most segment is paved. At the mouth of the valley adjacent to the south side of the paved segment is a cherry orchard. West of the orchard the road is unimproved dirt and gravel and surrounded by hillside open space. Photograph 1 shows a southeast view of the orchard from a point several hundred feet west of the orchard. Photograph 2 shows a west view from a location west of Photograph 1. As shown in photographs 1 and 2, the landscape along both sides of Oak Flat Road in this area is dominated by grass-covered, rolling hills. Other vegetation is sparse, except for occasional trees in canyon drainage ways, as can be seen in the left corner of photograph 2. Overall, the visual interest in this area consists of the rolling topography and ravines which create a rural, but generally simple and repetitive visual impression.

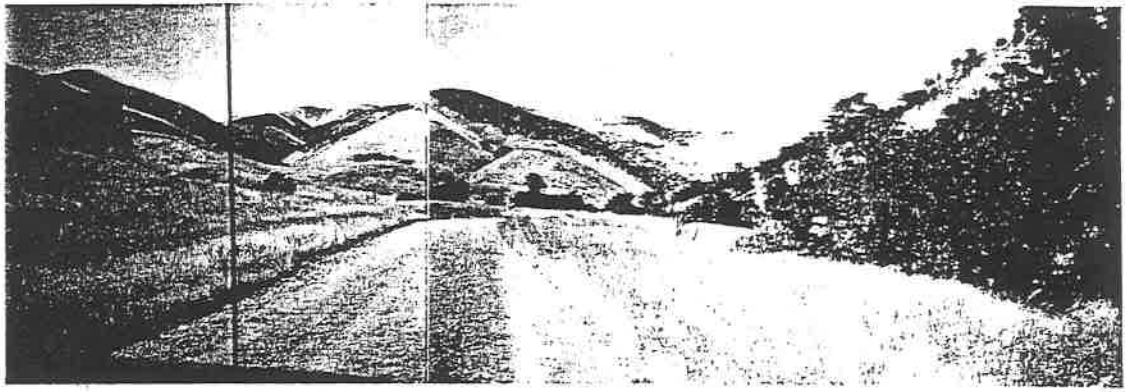
Approximately 2.5 miles west of I-5, Oak Flat Road crosses Salado Creek with a one-lane bridge. From this point the roadway generally follows the creekway, winding through increasingly hilly terrain. Various elements modify the landscape, contrasting with the visual impression of the previous "bald hills" segment of roadway. These elements include areas of multi-layered riparian vegetation, numerous stands of old oak, pepper and other trees, brush areas, and rock-outcroppings. Photograph 3 shows a typical view with some of these elements, facing west to a road bend.

Approximately seven miles west of I-5 is the entry to the Phase 1 site. The roadway trends southwest for approximately four miles to the Village 1 boundary. Photograph 4 is a view north along the entry roadway, showing a valley clearing framed by rolling hills dotted with oak clusters.

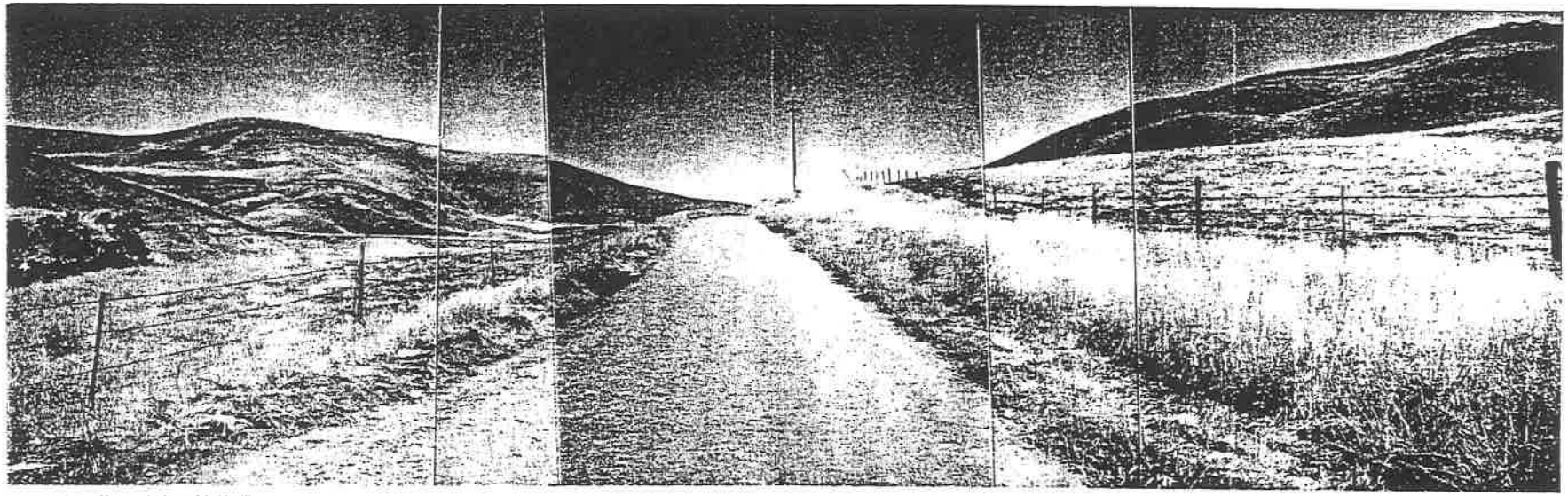
Photograph 5 shows the view west with the Village 1 site boundary near the center, near the juncture where Lotta Creek flows into Salado Creek.



Photograph 1. Southeastward view of orchard.



Photograph 3. Westward view west of Salado Creek.



Photograph 2. Westward view of bald hills.

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Figure IV.G-3

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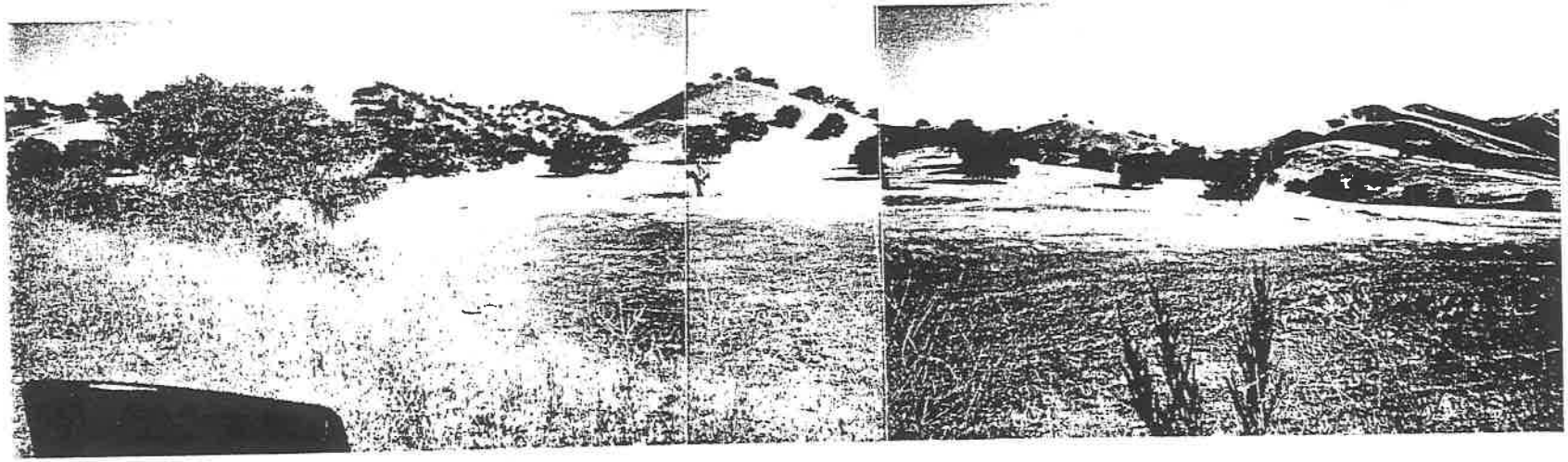
Photographs 1-5; Oak Flat Road Views



Photograph 4. View north along entry road.

Photograph 5. View west at Village One boundary.

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Figure IV.G-3

LSA

Photographs 1-5; Oak Flat Road Views

Views from Primary Access Road

Phase 1 includes the ROW of the primary access road extending from Sperry Road to its junction with Oak Flat Road just west of where the high voltage transmission lines cross Oak Flat Road. Figure IV.G-4: "Photographs of the Primary Access Road" shows six views from this route.Photograph 1b shows the north view from the primary access road near the intersection of Oak Flat Road. The landscape is dominated by grass-covered, rolling hills. Also seen from this viewpoint are power lines along the existing roadway and, peering over the top of the hill to the right of the photograph are the high voltage transmission lines which run alongside approximately two-thirds of the length of the access road.

Photograph 2b shows the north-to-northwest view from a point approximately one mile north of photograph 1b. This view shows the roadway winding through a flatter portion of grass-covered landscape bordered by rolling hills. This view illustrates how the transmission towers and lines tend to dominate the landscape in those areas it crosses or is alongside the roadway, denigrating the landscape's natural appearance. This view shows ranchstead structures and fencing in various states of condition and grazing cattle. Effects of overgrazing is apparent in some denuded portions of the surrounding hillsides.

Photograph 3b shows the west view at a point approximately one mile north of photograph 2b and illustrating a severely overgrazed hillside.

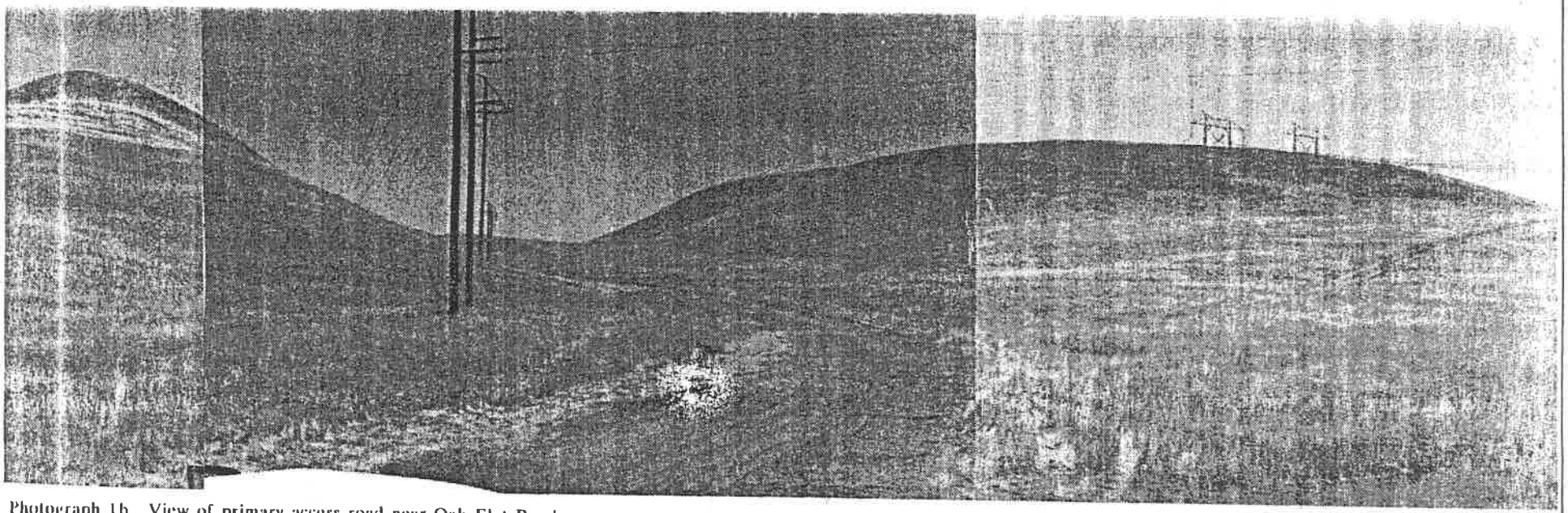
Photograph 4b shows the northeast view from a point approximately one-half-mile north of photograph 3b and approximately one-quarter-mile southwest of I-5 and Sperry Road. Again, this view shows the grass-covered rolling hills typical of the entire length of this access roadway. In midview just left of the fence is a saline seep. Between the opening of the hills, truck traffic on I-5 is visible, as well as the cultivated valley east of the freeway.

Photograph 5b is a close-up view of the saline seep area. Here the vegetation includes high-growing bunch grass and other green forbs. Not apparent in this photograph is the presence of water in the seep area.

Photograph 6b is the south-to-southwest view just west of the intersection of the access road and Sperry Road; the existing gate would appear just left of the photograph and the paved roadway is Sperry Road.

Views from Oak Flats Ranch (Village 1)

Overview. The Village 1 site is 3,400 acres in a portion of the Salado Creek watershed. Its most significant landform is Oak Flats valley, approximately 2,000 to 4,000 feet wide, extending over the outlet from the northeast to the southwest and surrounded by gently rolling hills. The Oak Flat valley is the overall site's largest valley. It is bounded on the south by an unnamed



Photograph 1b. View of primary access road near Oak Flat Road.

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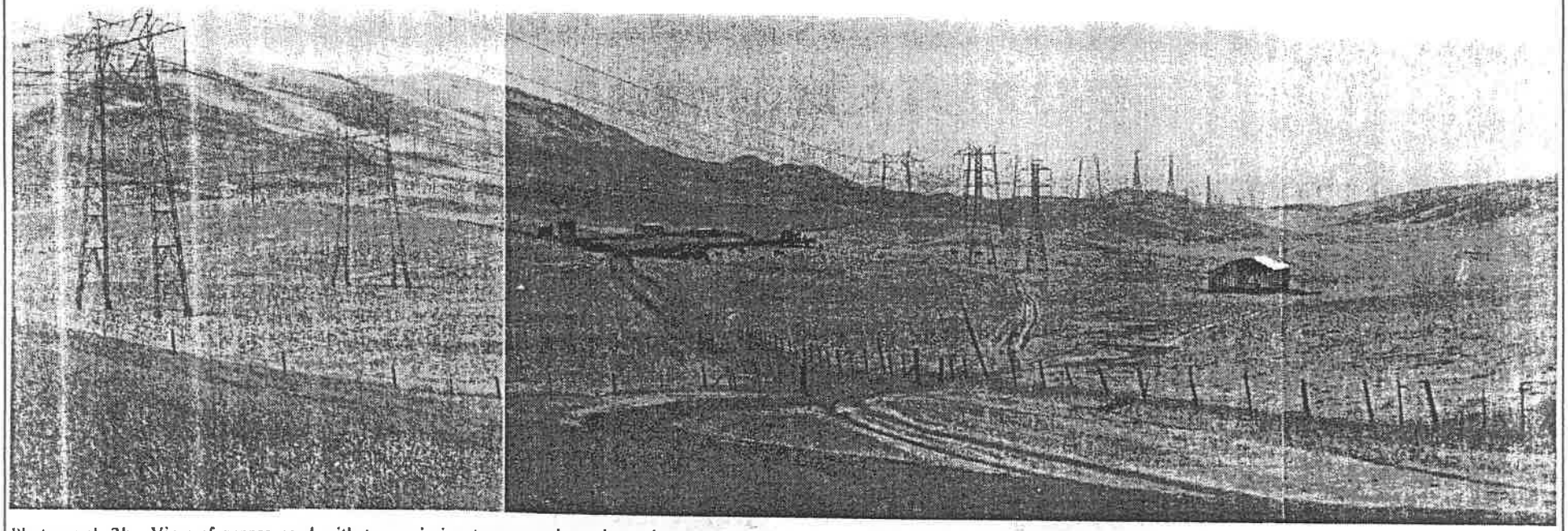
Figure IV.G-4

LSA

Photographs 1b - 6b; Primary Access Road Views



Photograph 2b. View of access road with transmission towers and ranch steel structures.

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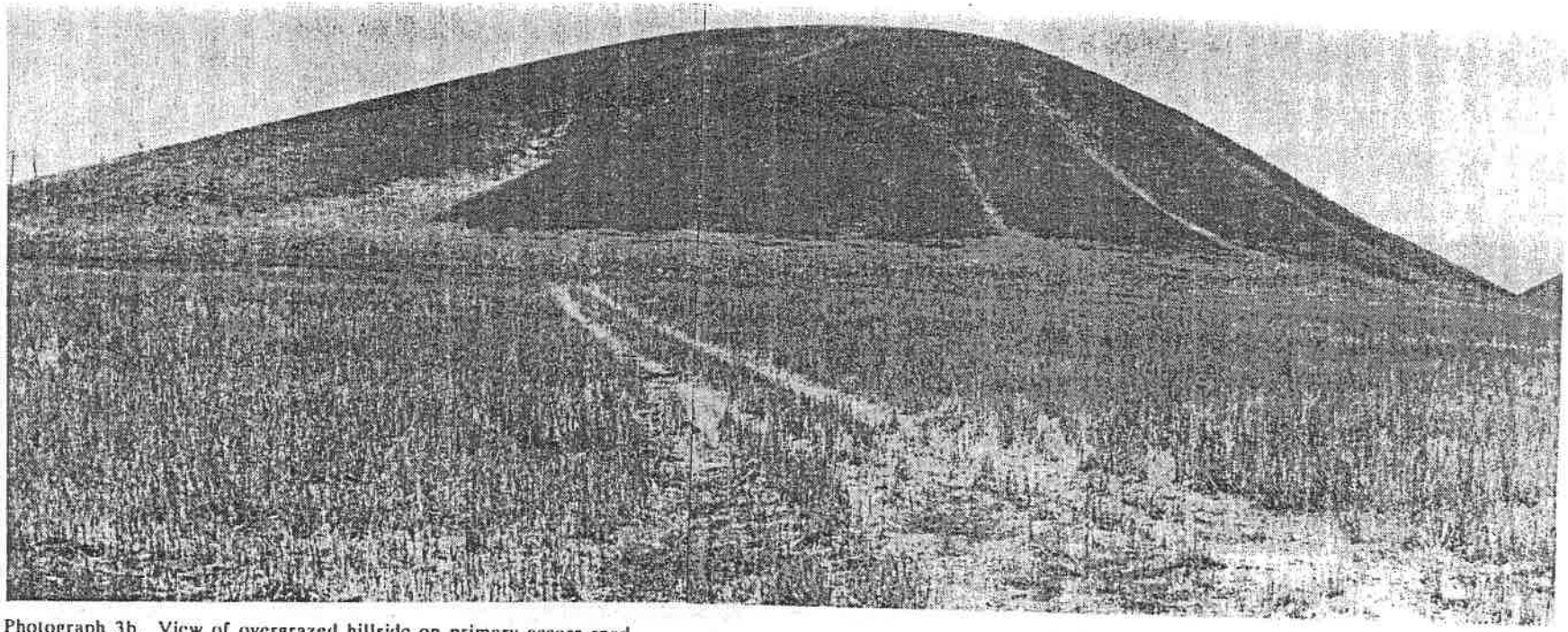
Figure IV.G-4

LSA

Photographs 1b - 6b; Primary Access Road Views



Photograph 3b. View of overgrazed hillside on primary access road.

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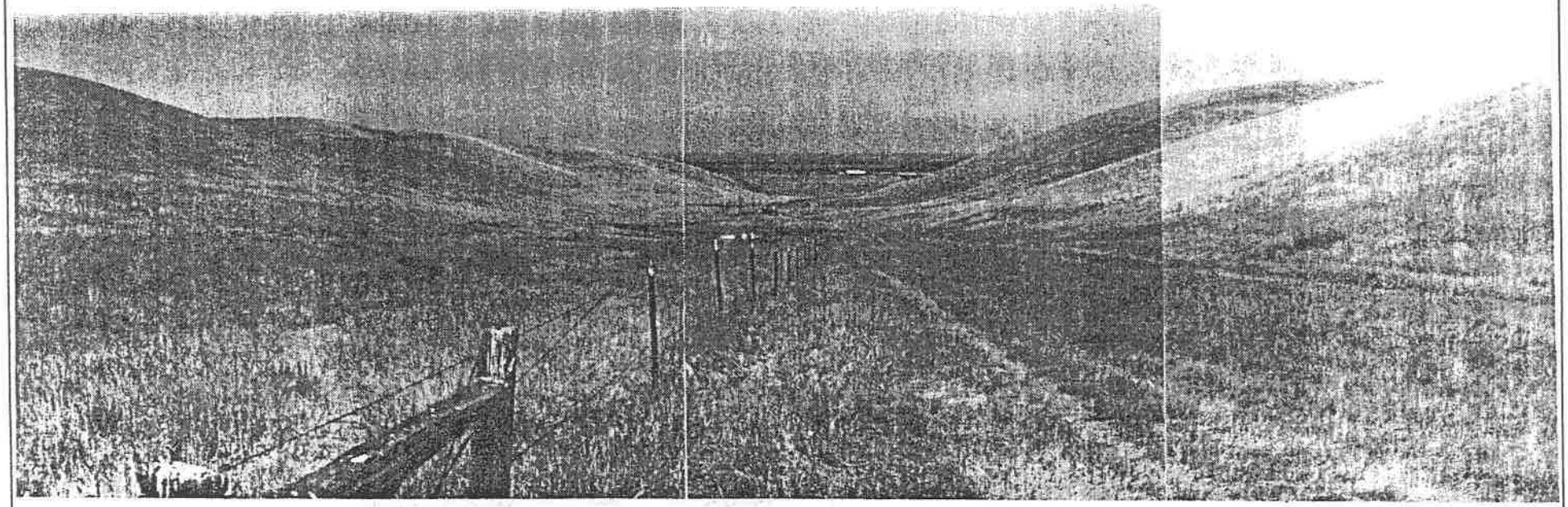
Figure IV.G-4

LSA

Photographs 1b - 6b; Primary Access R... Views



Photograph 4b. View from access road.

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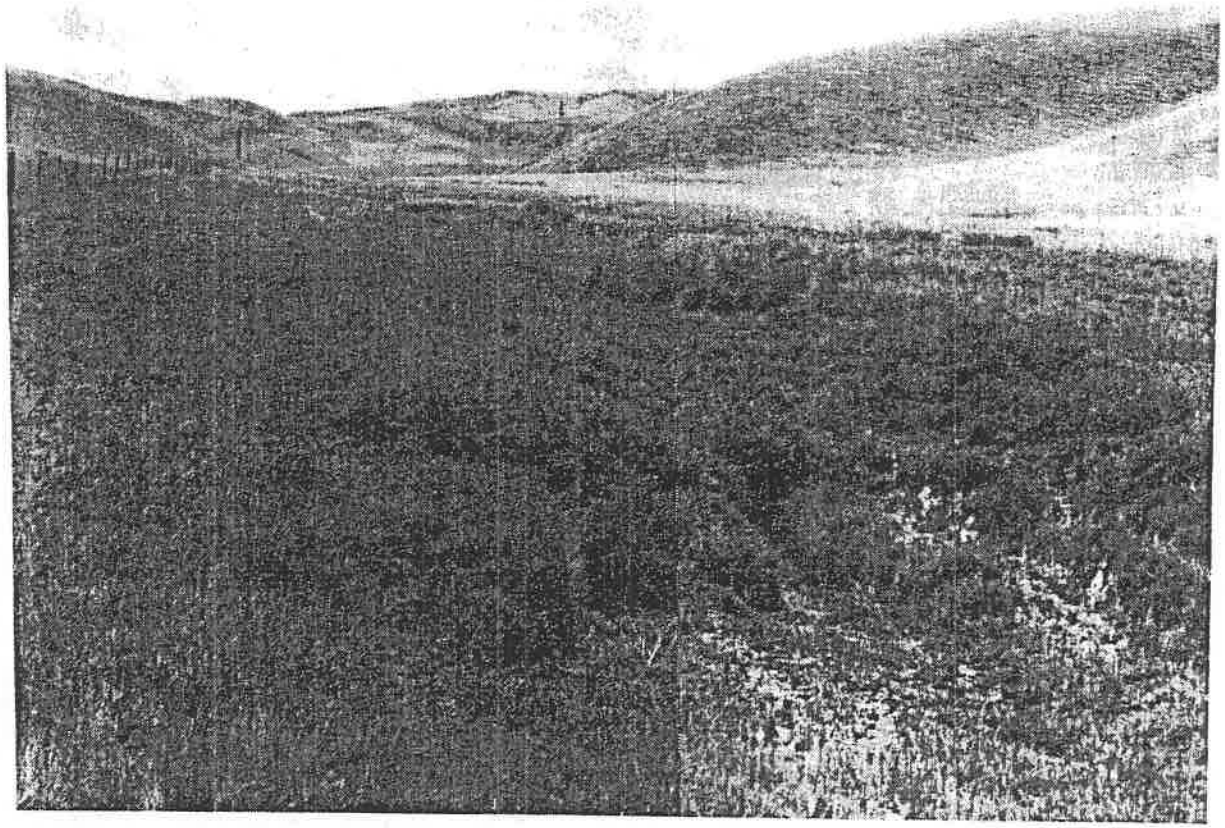
Figure IV.G-4

LSA

Photographs 1b - 6b; Primary Access Road Views



Photograph 5b. View of saline seep area.

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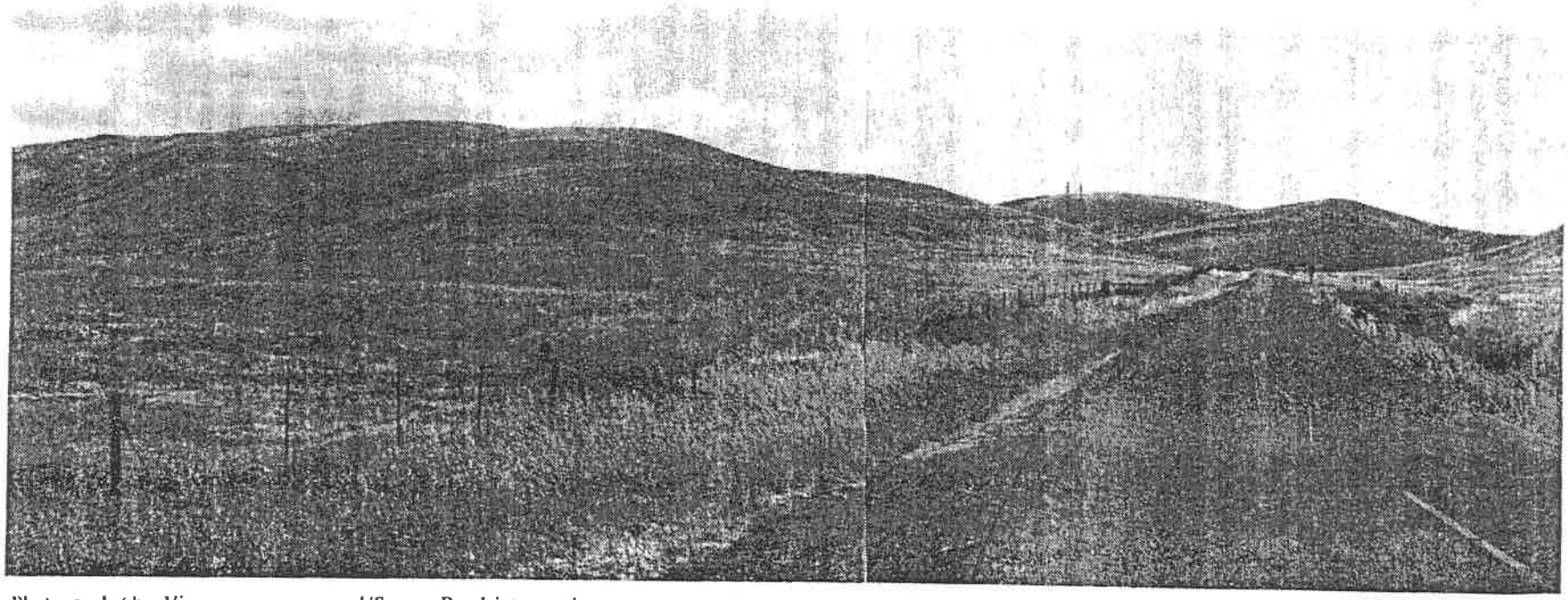
Figure IV.G-4

LSA

Photographs 1b - 6b; Primary Access Ro. Views



Photograph 6b. View near access road/Sperry Road intersection.

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Figure IV.G-4

LSA

Photographs 1b - 6b; Primary Access Road Views

ridgeline extending from a southeast peak (1,761 msl), rock outcroppings to the west end of the valley, the lower slopes of Copper Mountain to the north, and the narrow pass at the entrance to the valley on Oak Flat Road. Various mid-range and close-up views of the site are highlighted by other noticeable features, including:

- Occasional rock outcroppings, both north and south of Salado Creek and the western end of the main valley;
- Clusters of oaks and riparian communities in the swale and creek areas;
- Expansive areas of the valley's surrounding hills, frequently characterized by extensively overgrazed grasslands to the point of appearing denuded.

Village 1 Site Views. Figure IV.G-5: "Photographs of Village 1 Site Views" shows 15 views of the Village 1 site from the existing internal roadway. The photographs are numbered 6 to 20 and are keyed to Figure IV.G-2.

At the entry of Village 1 the valley opens up on the west. Photographs 6 and 7 are from the main ranch roadway, which essentially is an extension of Oak Flat Road onto the project site.

Photograph 6 is the view near the entry facing northwest, showing the valley floor, the topmost east embankments of Salado Creek and rolling hills. Photograph 7 shows the view northwest approximately .75-mile south of Photograph 6, where the valley is widely open. On the left side of Photograph 7 is a view of the isolated ranch complex of Oak Flats Ranch, which is composed primarily of weathered ranch buildings. These houses and barns were used historically as the Oak Flats Ranch headquarters. A row of trees follows the banks of Salado Creek. Left of center of Photograph 7 is the existing test vineyard, which is screened from this view due to vegetation and topography.

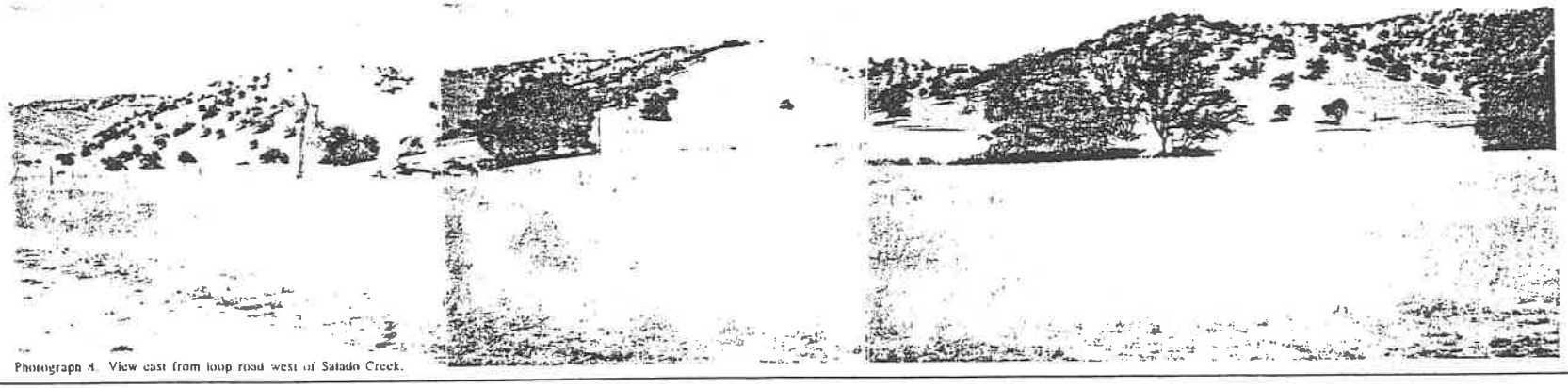
Photographs 8 through 17 are taken from the Oak Flats Ranch loop roadway which extends off the primary roadway traversing the valley, and are described below.

Photograph 8 shows the same general area facing east from the west side of Salado Creek, The background hills in Photograph 8 are in the Salado area, outside of Phase 1 but part of the overall project site area.

Photograph 9 shows the view west from approximately one-fourth mile northwest of Photograph 8. The left side of Photograph 9 shows the roof of the relatively-new main ranch house. The right side shows the loop road bend to the south to its termination at the ranch house. From this view the foreground is generally wide, treeless, framed by rolling hills which are dotted with vegetation.

Photograph 6. View northwest across Owen Flat Valley floor.

Photograph 7. View northwest across Oak Flat Valley floor.



Photograph 8. View east from loop road west of Salado Creek.

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Figure IV.G-5

LSA

Photographs 6-20; Village 1 Site Views

Photograph 9. View west from loop road.

Photograph 10. View east from loop road.

Photograph 11. View north from loop road.

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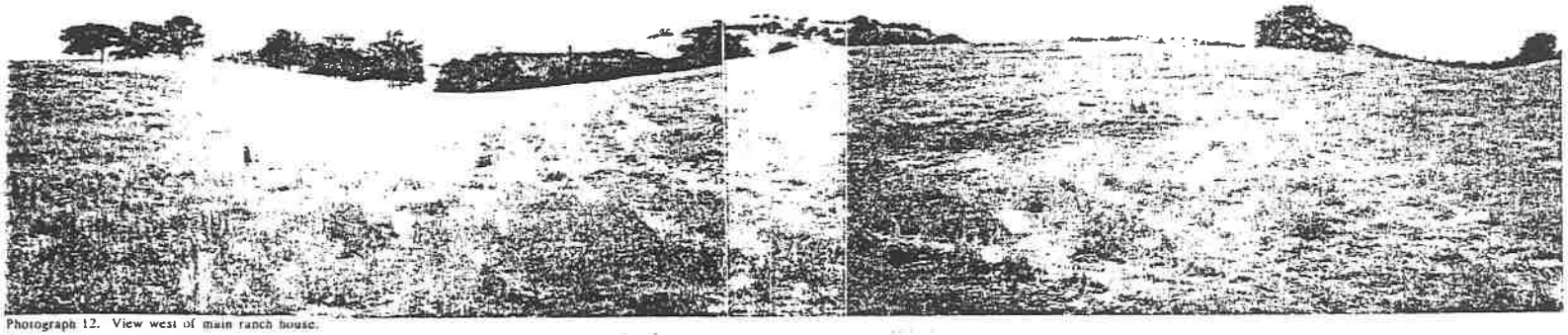
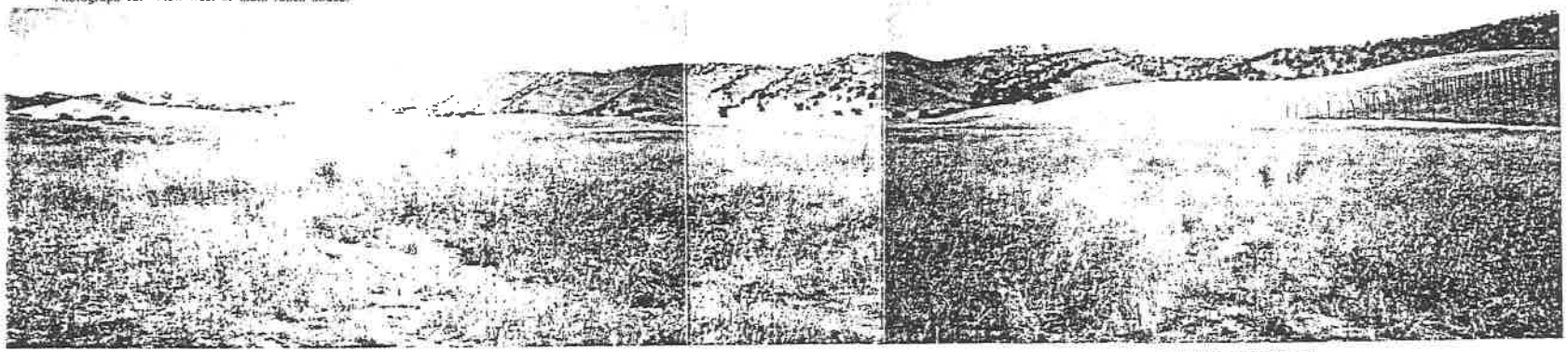
Figure IV.G-

LSA

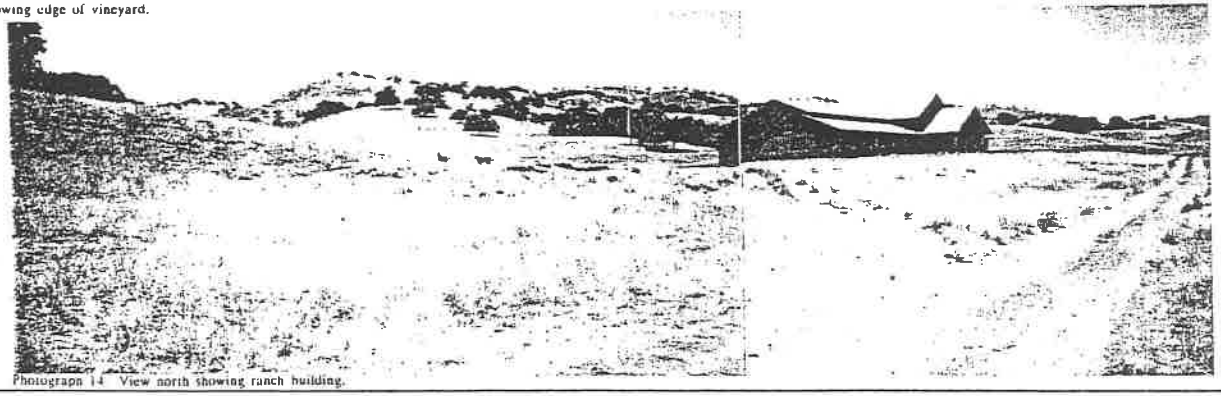
Photographs 6-20; Village 1 Site Views



Photograph 12. View west of main ranch house.



Photograph 13. View east showing edge of vineyard.



Photograph 14. View north showing ranch building.

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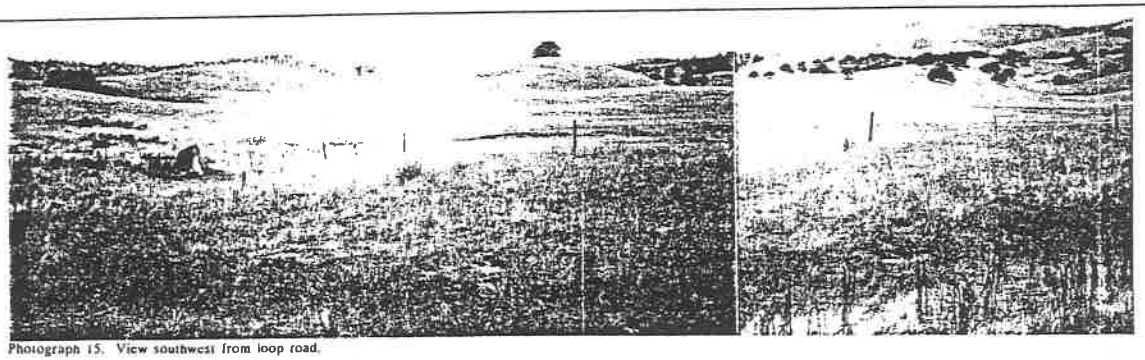
Figure IV.G-5

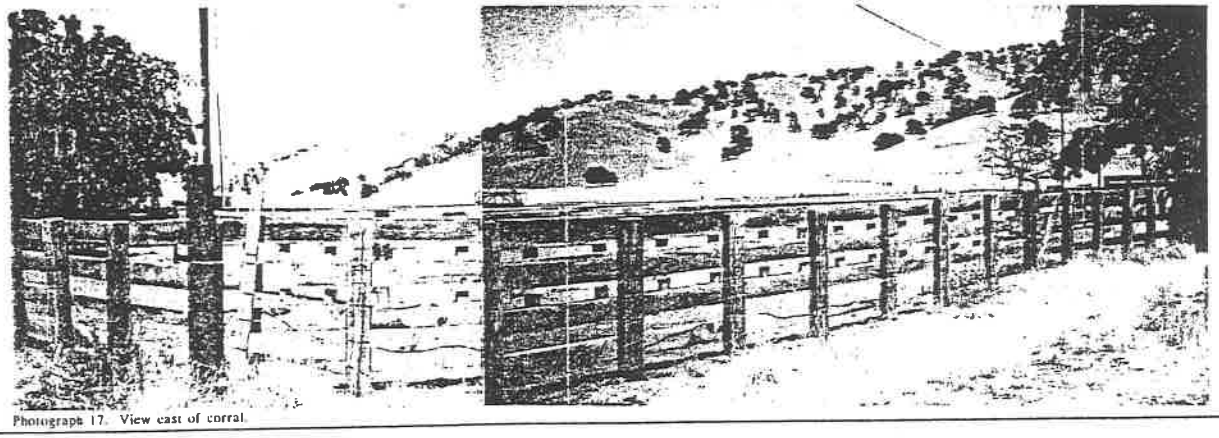
LSA

Photographs 6-20; Village 1 Site Views



Photograph 15. View southwest from loop road.

Photograph 16. View east of old barn.



Photograph 17. View east of corral.

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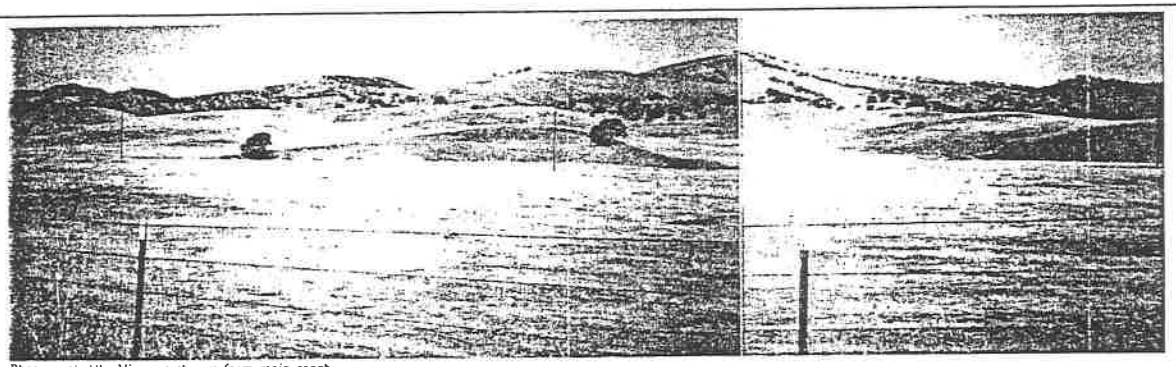
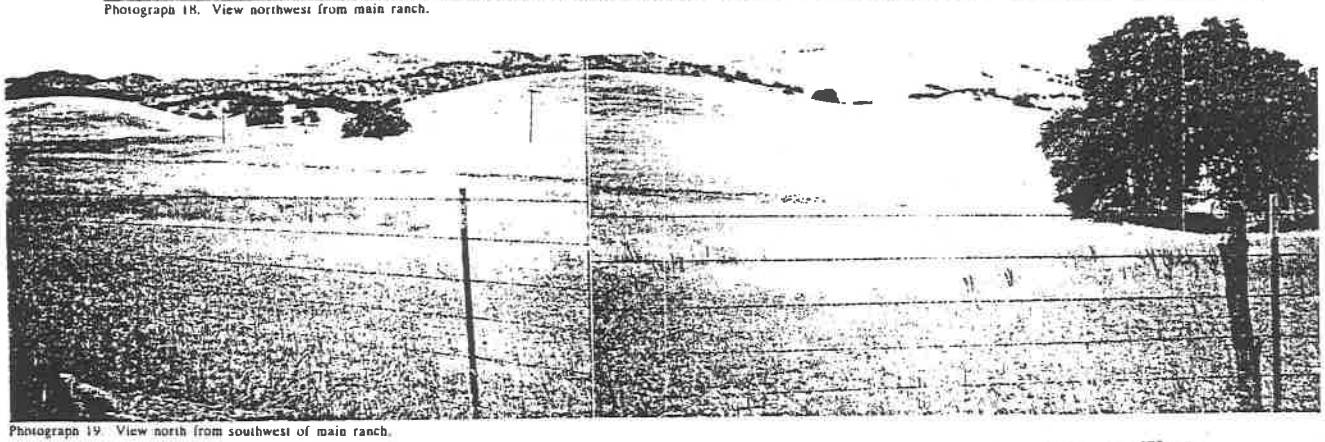
Figure IV.G-5

LSA

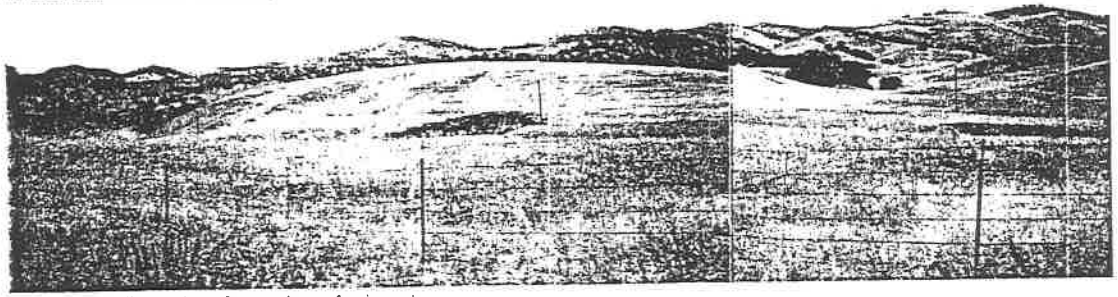
Photographs 6-20; Village 1 Site Views



Photograph 18. View northwest from main ranch.



Photograph 19. View north from southwest of main ranch.



Photograph 20. View northwest from southwest of main ranch.

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Figure IV.G-5

LSA

Photographs 6-20; Village 1 Site Views

Just under one-half mile north of Photograph 9, north of Salado Creek, Photograph 10 shows the view east, with the Salado area outside of Phase 1 framing the foreground. This view shows more of the treeless flats which dominates the Phase 1 site. Photograph 11 shows the north-most view of the Phase 1 site, approximately one-quarter mile north of Photograph 10.

Moving southwest, photograph 12 is another view west of the main ranch house, similar in orientation as photograph 8, but approximately one-half mile west and showing the gently rolling terrain.

Photograph 13 is the view east from approximately the same location as Photograph 12, showing the edge of the approximate 1.5-acre test vineyard, the grassland flats and the Salado hills outside of Phase 1.

Photograph 14 is the view north from a point just south of Photograph 13, showing a ranch building and roadway.

Photograph 15 is the view southwest from a point just south of Photograph 14. This view features the silhouette of a lone oak against the open sky, set in the gently rolling terrain.

Photograph 16 is the view east approximately one-fourth mile east of photograph 15. This view features the old barn and other out-buildings associated with Oak Flats Ranch, the flats, and the tree-dotted Salado hills.

Photograph 17 is a view east just east of photograph 17 and features the Oak Flats Ranch corral.

Photograph 18 is a view northwest from the main ranch (rather than the loop road) approximately one-half mile south from the location of Photograph 10, also on the main ranch road. Photograph 19 is the view north at approximately one-half mile southwest of Photograph 18. Photograph 20 is the view northwest approximately one-fourth mile south of 19. These three views feature the site's broad expanse of valley and hills.

Overall Site

Introduction

The overall site consists of gently-sloping to steep ridges encompassing portions of the Orestimba, Crow and Salado creeks' watersheds. Topography of the overall site is similar in character to the Phase 1 site of flat to gently sloping interior valleys bordered by steep sided ridges. Site elevations range from 900 feet msl in the valleys to over 2,600 feet (msl) at Mike's Peak and Copper Mountain. Similar to Phase 1, the form and character of the valleys and surrounding hills, and the patterns of tree cover provide uninterrupted views throughout the site. A network of unpaved ranch trails and roads traverse the

site, meandering along the bottom of the side valleys and extending to the higher ridge areas.

Figure IV.G-6: "Photographs of Overall Site Views" shows 13 views of the overall project site from the existing internal roadway. The photographs are numbered 21 to 33 and are keyed to Figure IV.G-2.

Views from Copper Mountain (Village 2)

Photograph 21 is the view southwest of Copper Mountain. It is approximately three-fourths of a mile northwest of Photograph 11 and is the northernmost photograph showing Phase 1. This view is mid-slope and features one of the many distinctive rock-outcrops in the project site. Shrubby vegetation and pronounced contours creates a more layered appearance than in the Oak Flat valley.

Views from Indian Rocks (Village 3)

Photograph 22 is the view south from the entry of Village 3. The Indian Rocks valley has an appearance very similar to Oak Flat valley with grassland framed by gently rolling terrain, dotted with oak trees.

Photograph 23 shows the view south in the south edge of Village 3, approximately three-fourths of a mile south of Photograph 22. This view shows similar terrain, but with a substantially denser tree cover in the hills.

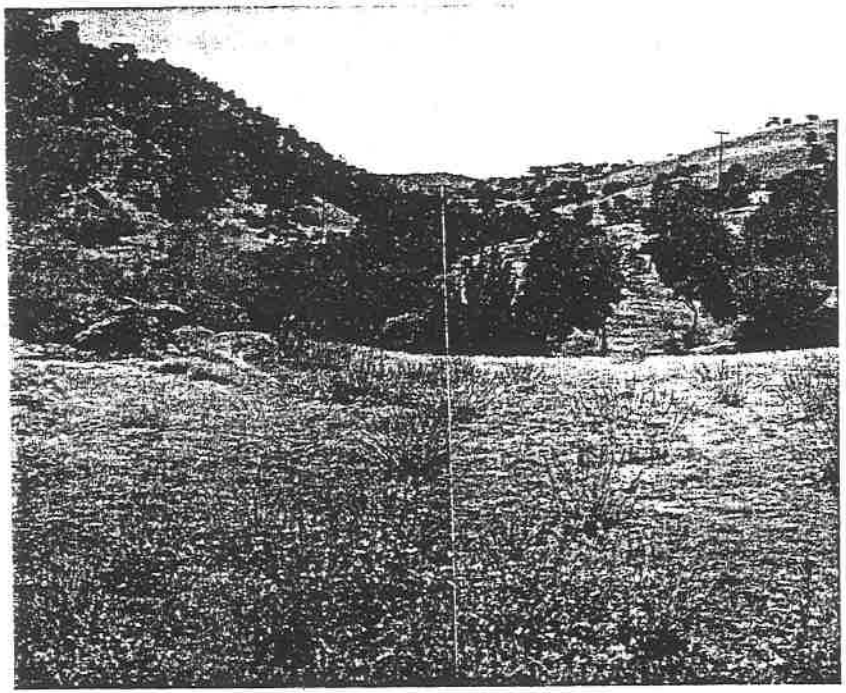
Views from Crow Creek (Village 4)

Photograph 24 is the view southeast from the western edge of Village 4 approximately three-fourths of a mile southeast of Photograph 23. This view is of the descending slopes along a tributary of Crow Creek, illustrating the difficult access of the embanked entry roadway, and featuring rock out-crops and hardwood forest land.

Photograph 25 is the view southeast approximately one-half mile southeast of Photograph 24. It shows Crow Creek valley in Village 4. The valley is grass covered with occasional trees, framed by hills with mottled clusters of trees, creating a sense of enclosure that contrasts with the openness of Oak Flat valley.

Photograph 26 is the view northeast of Crow Creek valley approximately 1.25-mile east of Photograph 25, and showing the similar sense of enclosure apparent in 25.

Photograph 27 is the view northwest of Crow Creek valley just northeast of Photograph 26, and is also framed to create a sense of enclosure.



Photograph 21. View southwest of Copper Mountain.

Photograph 22. View south from entry of Village Three.

Photograph 24. View southeast from west edge of Village Four.

Photograph 23. View south from south edge of Village Three.

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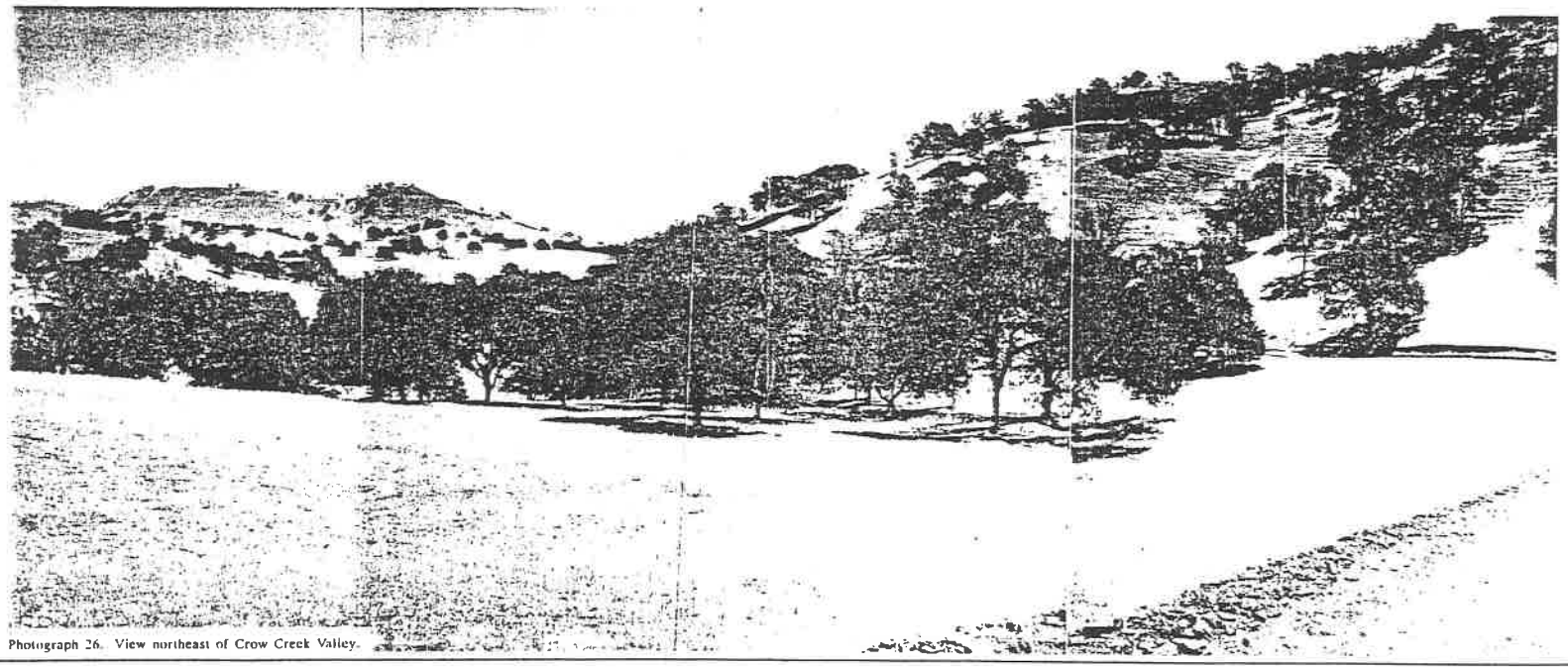
Figure IV.G-6

LSA

Photographs 21-33: Overall Site Views

Photograph 25. View southeast of Crow Creek Valley.



Photograph 26. View northeast of Crow Creek Valley.

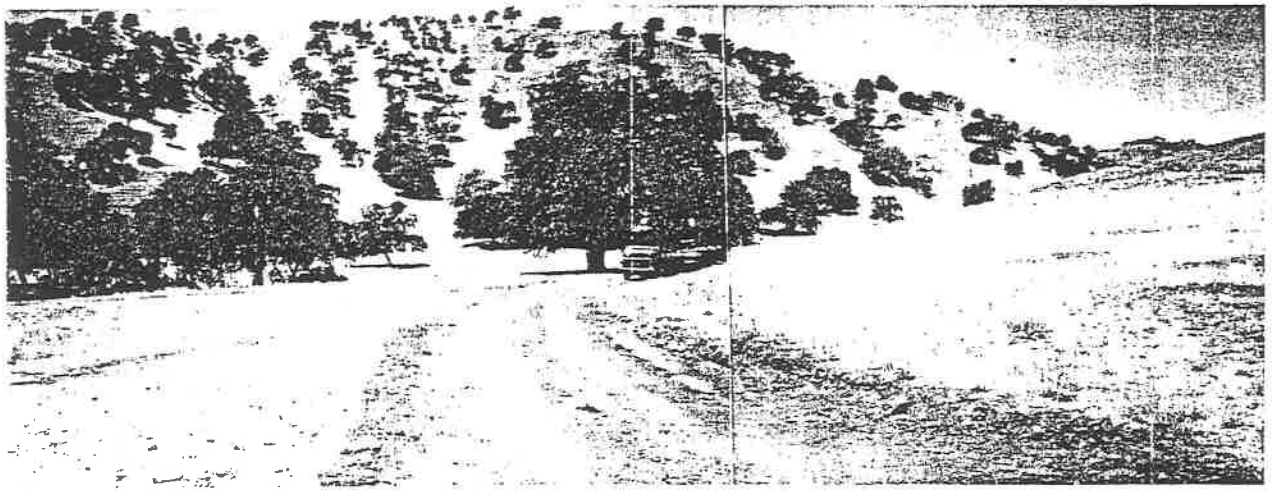
12-12-91(STC102)

Figure IV.G-6

LSA

Photographs 21-33: Overall Site Views

Photograph 27. View northwest of Crow Creek Valley.



Photograph 28. View southwest of east edge of Village Four.

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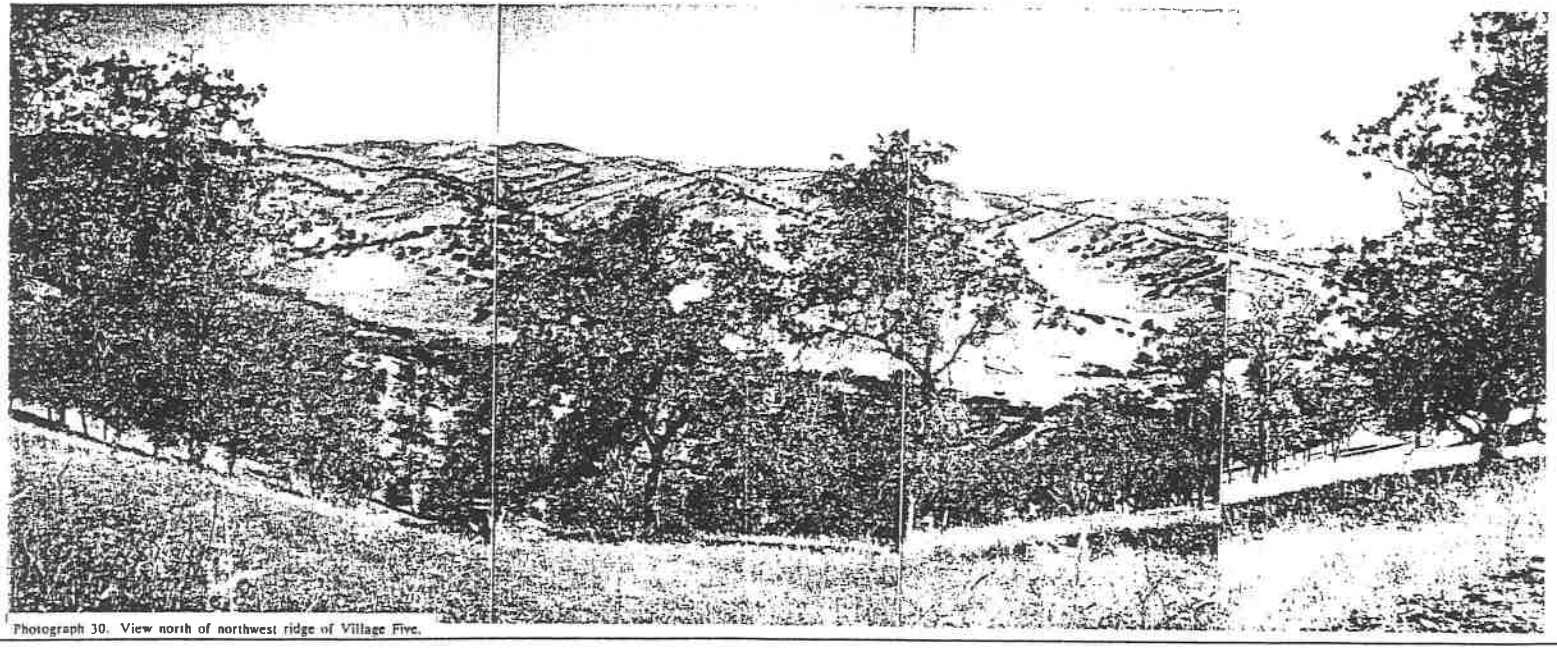
Figure IV.G-6

LSA

Photographs 21-33: Overall Site Views

Photograph 29. View east of Village Four.



Photograph 30. View north of northwest ridge of Village Five.

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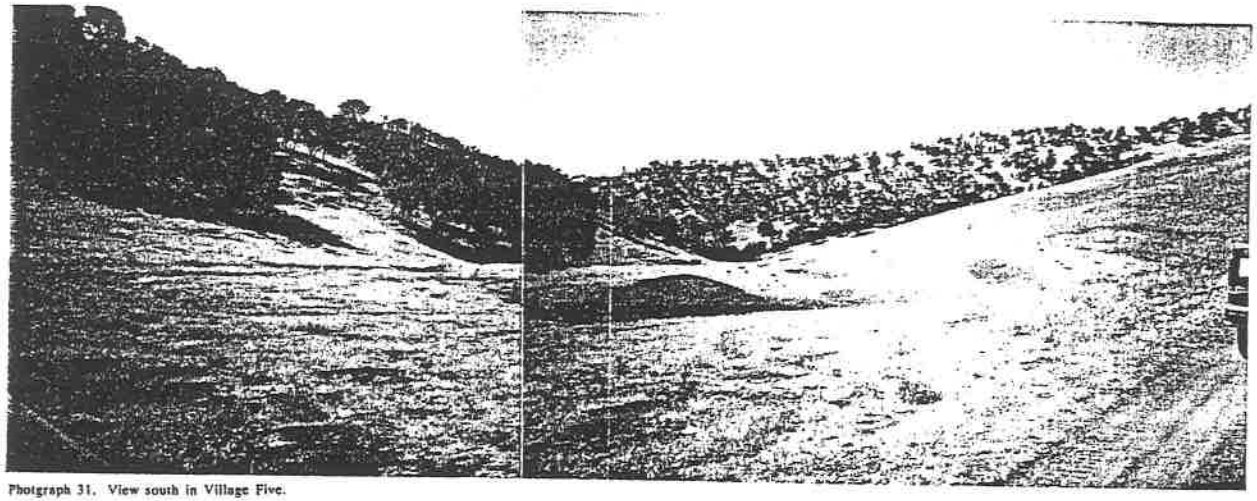
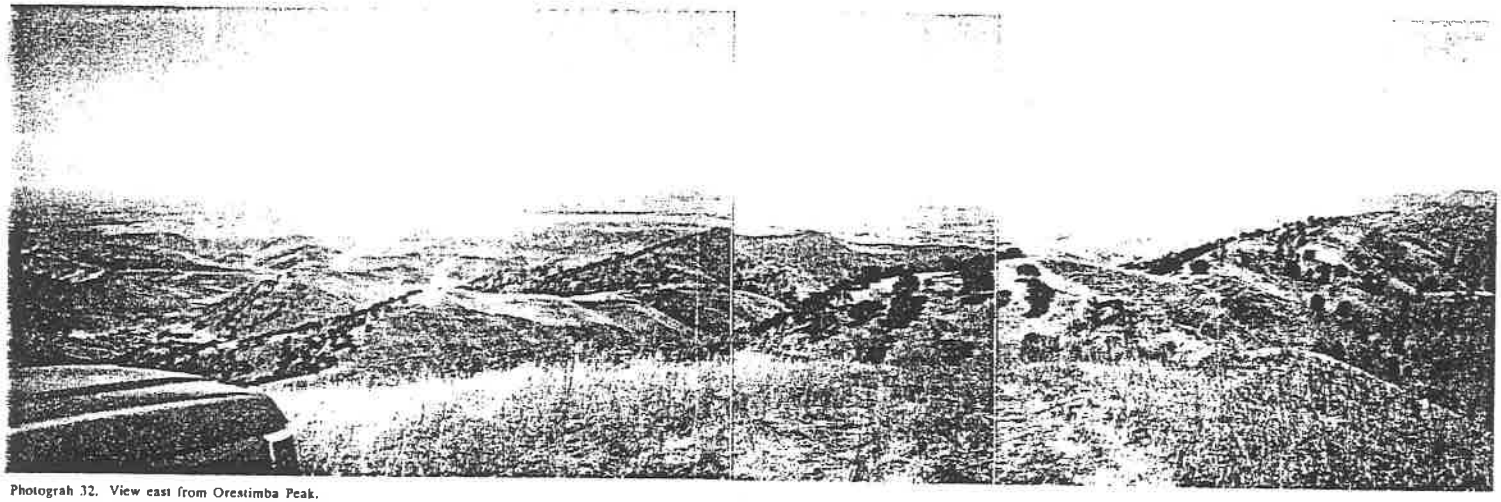
Figure IV.G-6

LSA

Photographs 21-33; Overall Site Views



Photgraph 31. View south in Village Five.



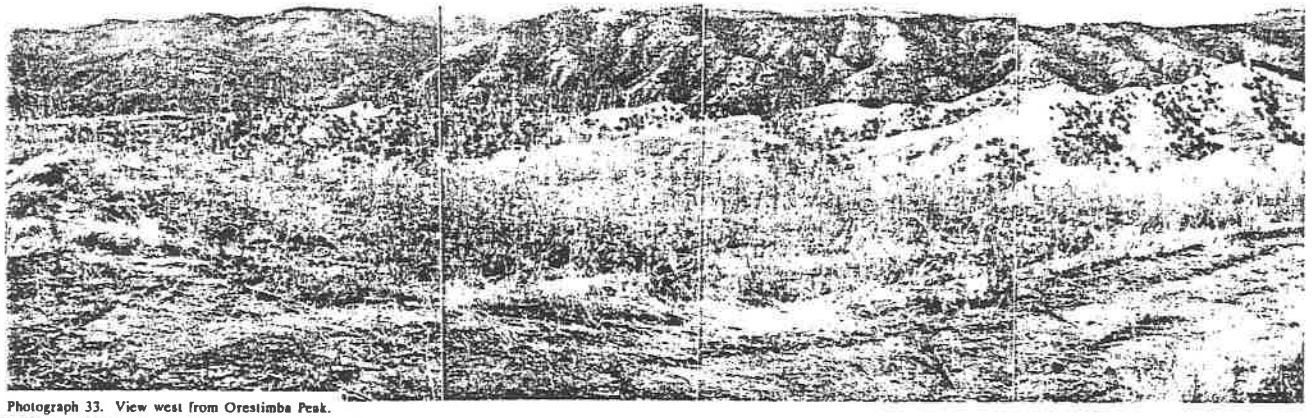
Photograh 32. View east from Orestimba Peak.

12-12-91(STC102)

Figure IV.G-6

LSA

Photographs 21-33: Overall Site Views



Photograph 33. View west from Orestimba Peak.

Photograph 33, continued.

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Figure IV.G-6

LSA

Photographs 21-33; Overall Site Views

Photograph 28 is the southwest view from approximately 1.25-mile northeast of Photograph 27, showing the eastern edge of Village 4; Photograph 29 is the view east from the same location. Both photographs 28 and 29 show the moderately undulating slopes of this portion of Village 4.

Views from Orestimba (Village 5)

Photograph 30 is the view north from the northwest ridge of Village 5, approximately one-fourth mile from Photograph 25. This expansive view looks out over Crow Creek and the valley to the horizon line of the Diablo Range, including Copper Mountain, appearing in the center. From this viewpoint, the sense of the wide open spaces of the Diablo Range and isolation of the project site from urbanized areas are keenly apparent.

Photograph 31 is the view south in Village 5 from a location just east of Photograph 30. It shows an enclosed gently-sloping area and features a stock pond.

Photograph 32 is the panorama view east from Orestimba Peak, located at the southeast edge of the site. The view looks out across the east slopes of the Diablo Range towards I-5 (approximately eight miles from Orestimba Peak) and the San Joaquin Valley. Photograph 33 is the panorama view west from Orestimba Peak. This view faces into the Diablo Range to the edges of the project site and beyond. Just left-of-center is Wilcox Ridge, located near the south edge of the site; just right-of-center is Mike's Peak, located near the west edge of the site; and by the right edge of the photograph is Copper Mountain, located in the northwest corner of the site. The sweeping panoramas of photographs 32 and 33 provide a strong visual impression of the breadth and magnitude of the project site.

Potential Impacts

Introduction

This section provides evaluation of the visual impacts of the project based on the field survey, a review of photographs 1 to 34, and a comparison of existing conditions with the project land use plans and grading plans, and project policy statements with bearing on site development. Other visual aids for evaluating project impacts, such as building models or photomontage simulations, are currently not available. Figures 20-27 of the Draft Specific Plan do provide examples of how housing types and resort land uses would fit in with the existing creekways, tree cover, and hill areas.

Phase 1

Visual Quality of Oak Flat Road Viewshed

County-Maintained Segment of Oak Flat Road. Photographs 1, 2, and 3 show southeast, west and west views, respectively of the county-maintained segment of Oak Flat Road. Each photograph shows Oak Flat Road, which, in Phase 1 would be a two-lane paved roadway. Exclusive of improvement of the road, no off-site visual changes would occur alongside the road due to the project. Paving the gravel road would somewhat change the characteristics of the road, but not to the point of significance. The road would continue to be appropriate for the rural ambience of the project setting by remaining two lanes, following the original alignment, and winding along the creek.

Current Oak Flat Road traffic levels are insignificant, minimizing the current perceived level of public concern towards visual changes in the landscape of Oak Flat Road. However, public usage of the roadway would increase significantly with the development of Phase 1, increasing the potential public concern towards future visual changes to this landscape.

Entry Area of Oak Flat Parkway. Photograph 4 shows a northwest view of the Phase 1 entry area off Oak Flat Parkway. This would be among the first views of development for all incoming project traffic.

The Photograph 4 panorama is very similar to the panorama of entry development as shown in the Project Description in Figure III.D-7. Accordingly, a plant nursery would be between the foothills on the left side of the photograph; in the center would be the research campus; and a research campus housing area would be between the research campus and nursery. At the extreme right side would be the waste water treatment plant. The surrounding area would be in Conservation Areas open space, framing the development with open space.

Photograph 5 shows a northwest view of the proposed Village 1 entry point. In the foreground would be the proposed Oak Flat Parkway surrounded by hill Conservation Areas in the foothills. On the northwest side of the foothills would be proposed single family units which would likely not be visible from the location of the photograph.

Future public concern towards the visual quality of development in the entry area would occur, although not as high as the expected concern within the village areas, which would be the destinations of most residents and visitors. The research center, homes and water treatment plant would clearly be an urban use which would contrast with the rural ambience approaching the entryway. This contrast would be a significant, but not adverse if the development in this area included a sensitive site and landscape design that accentuates the natural landscape; use of appropriate architectural detailing and building materials that provides interest without undue attention to itself;

and use of native and naturalized landscaping materials that would tend to blend into the natural landscaping.

Visual Quality of Primary Access Route Viewshed

Photographs 1b through 4b show views along the entire length of the existing roadway, generally following the alignment for the primary access to Oak Flat Road and the Phase 1 project site. In Phase 1, this roadway would be a two-lane roadway, and appear similar to the segment of Sperry Road shown in photograph 6b. No other off-site changes would occur alongside the road due to the project. Paving the road would not significantly affect the view from the roadway. Because of the presence of the rolling hills, most viewpoints alongside the improved roadside will be limited. Existing and future views from the roadside are often denigrated because of the existing presence of the transmission lines (see photograph 2b).. As with Oak Flat Road, public concern about the visual quality along this private roadway is currently nonexistent, but would occur with its public usage to access Phase 1 development.

Visual Quality of Oak Flat (Village 1) Viewsheds

Introduction. Phase 1 would introduce the Village 1 mixed-use development scenario to the site, including 2,020 residential units, two golf courses, and commercial facilities. Part of the site would be graded to accommodate development.

The Village 1 area is visually screened from off-site views due to the ridgeline of on-site open space. Although development of the site would unavoidably affect its visual quality, it would not impact existing inventories of County visual resources, because the visual quality of the Village 1 site is not currently visible from any point off-site.

Development of Village 1 would cause potential internal visual impacts, affecting the views only of the future resident and visitor populations. Existing on-site elements which would be considered visually sensitive to Phase 1 population include the perceptions of the expansive open space, rolling topography, ridgelines, clusters and specimen trees, texture of grasslands, riparian drainage ways, and rock outcroppings.

Generally, if sensitive site planning and effective mitigation measures are utilized, then the development would be perceived as attractive and appropriate for the site by the development's future populations. The ultimate visual impression would result from preservation of key indigenous visual elements, sensitivity in resculpturing the land, intensity of landscaping, and the visual interest from the choices of building designs.

Visual impact issues in the Phase 1 area are addressed below as follows:

- development and open space areas within the viewsheds in photographs 6 to 20 are identified in order to provide the visual site and landscape context of the project;
- Phase 1 village area visual quality impact issues are addressed and evaluated on a per-issue basis.

Village 1 Views. Development of the Phase 1 portion of Village 1 would include replacing the natural, wild grassland with manicured, non-native grasses for golf courses and residential yards. Other natural, flat areas would become paved parking lots, and hills would be graded to accommodate development. The result of Village 1, and its accompanying human activity, would be a dramatic change from the existing rural ambience of the valley to an urban center.

Figure IV.G-7: "Village 1 Land Use Plan Key to Photographs" shows photographs 6 to 20 keyed to the Village 1 proposed land use plan. The evaluation below describes the proposed development of the Village 1 site on a per photograph basis.

Photograph 6 is the west view showing the proposed site of the Oak Flat Golf Club's 13th fairway in the foreground and the 12th fairway in front of Salado Creek. Photograph 6 shows some riparian vegetation which is considered a sensitive visual resource. The rolling hills in the background would have single family detached housing on the left side of the photograph, which would be potentially visible at the ridge of the hills.

Photograph 7 shows a northwest view of the single family homes in the foreground backed by Salado Creek. On the far side of the creek may be a restaurant or open space and then the shopping and town centers in the middle of the photograph. In the background hills, attached single family homes would be located to the northwest and the vineyards to the west and southwest.

Photograph 8 shows an east view of the same area shown in photograph 7. A restaurant is proposed to be in the foreground backed by Salado Creek. Straddling the creek to either edge of the photograph would be a community park, with single family homes occupying the hills to the northeast.

Photograph 9 is a northwest view at the northwest end of the attached single family homes shown from the southwest by photograph 8. In the foreground on the left side of the photograph would be the town center and shopping center. In the rolling hills would be the hotel and conference center. On the right side across from the town center would be the winery and vineyard. Near the right edge would be attached single family residential units.

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Figure IV.G-7

N
LSA Scale in Feet

←1 Location of Photographer and Direction of Photographic View.

Key to Photographs of Phase I Site

Photograph 10 shows an east view which includes the lower portion of the 6th fairway in the foreground. Detached single family homes would be at the base of the foothills and Conservation Areas open space along much of the ridge.

Photograph 11 shows a north view of the 5th fairway of the proposed Oak Flat Golf Club. In the background, to the right of the photograph, would be the public services facility/water treatment plant.

Photograph 12 shows a northwest view of the Oak Flat Golf Club clubhouse. The swim/tennis club would be in the foreground, and the spa and vineyard to the left of the photograph. Fairways 1 and 18 would occupy the background foothills. Beyond the fairways would be single family homes that would be potentially visible below the ridgeline of the hills.

Photograph 13 shows an east view of the valley which would be well-developed with the hotel conference center, town center and shopping center. On the foothills to the right of the photograph the existing test vineyard would be enhanced. The foothills beyond would potentially show attached and detached single family homes.

Photograph 14 shows a north view of the Oak Flat Golf Club facility shown in photograph 12. In the foreground would be the proposed spa and swim/ tennis club. In the right of the photograph would be the 1st fairway in the foreground. Single family homes would potentially be visible to the left.

Photograph 15 shows a southwest view of the proposed Salado Creek Golf Club fairways 17 and 16, and the northwest portion of fairway 2 in the foreground. The fairways would have attached single family residential units to the left of the photograph and in the upper right. The background wooded hill in the left would partially be occupied by residential housing.

Photograph 16 shows a southeast view of fairway 3 of the Salado Creek Golf Club on the right side of the photograph and Oak Flats Historic Park, including the barns, in the central foreground. The Polo Center would be directly behind the park. The wooded hills in the background would contain some attached single family homes, but would be predominantly Conservation Areas.

Photograph 17 shows a southeast view of the proposed Polo Center in the foreground. The hills in the background would have attached single family residential units on a portion of the right side of the photograph, and the remaining Conservation Areas open space.

Photograph 18 shows a northwest view of fairways 7 and 8 of the Salado Creek Golf Club in the foreground. The foothills and wooded hills would have detached single family homes.

Photograph 19 shows a northwest view of fairways 9, 10, 11 and part of 12 in the foreground and fairway 13 between the foothills on the left portion of the

photograph. The foothills in the foreground and wooded hills in the background would contain detached single family residential units.

Photograph 20 shows a northwest view of Salado Creek Golf Club fairways 11 and 12 in the foreground and fairway 13 between the foothills on the right side of the photograph. The foothill near the center would have multi-family homes, and the background wooded hills would have detached single family homes and Conservation Areas.

Open Space Visual Issues and Impacts. The existing visual impression of expansive open space would unavoidably be diminished by any on-site development. However, the project helps reduce the open space visual quality impacts with the proposed Copper Mountain and Salado Hill Conservation Areas. Site development in the upper hills which encroaches on these areas would have the most impact on open space visual resources from valley locations.

The area east of Oak Flat Parkway would be open space, except along the frontage of the connector roadway and the lower drainageways and areas of low relief where four pockets of cul-de-sac development are proposed. These cul-de-sac areas would be visible to Oak Flat Parkway traffic and to many homes located along the lower slopes across the valley looking out toward the expansive Salado Conservation Area.

Grading Visual Issues and Impacts. Grading would unavoidably change the existing contours of the site. However, this impact is not necessarily considered to be visually significant, even in areas where substantive grading may occur, if the grading is successfully visually characteristic of existing forms. The on-site existing topography combines the site's flat valley and its rolling hills to allow for a sensitive grading plan integrating the existing visual character of the topography. The Preliminary Grading Plan indicates that grading would avoid benching or other visually disruptive grading techniques. The graded areas of concern with the most potential impact would be the single family areas in the west portion of the site within the Salado Creek Circle loop.

Vegetation and Landscaping Visual Issues and Impacts. Due to the multitude of on-site trees, some tree removal could occur without significantly affecting the visual impression of the site's vegetative cover. The project would maintain creekside Conservation Areas, thereby maintaining the visual integrity of the drainageways. The numerous on-site rock outcroppings are a relatively unusual feature which are important elements of the site's visual integrity, providing natural focal points and texture.

Community Architectural and Site Design Issues. The predominant architectural motif of the project is loosely defined as California architecture, implying a predominance of low, wood-and-earthtone finished buildings. The most prominent buildings would be the town center, shopping area, and hotel/convention center, and are considered to be the buildings of most concern. Their potential visual impacts would depend on their orientation, building envelopes, and architecture.

The project may have visual impacts due to the appearance of siding and roofing material. Sensitive choice of texture, paint color, and/or wood finish could help integrate project development into the landscape. Conversely, insensitively chosen texture and color elements that would bring unwanted attention to project development would heighten its visual impact.

Phase 1 Conclusions of Significance

Public usage of Oak Flat Road would increase significantly with the development of Phase 1, increasing public concern towards future visual changes to this landscape. Future public concern towards the visual quality of development in the entry area would occur, although not as high as the expected concern within the village areas. The Village 1 area is visually screened from off-site views by the on-site open space ridgeline.

Development of Village 1 would cause potential internal significant visual impacts, affecting the views only of the future resident and visitor populations. Elements which would be considered visually sensitive include the expansive open space, rolling topography, ridgelines, clusters and specimen trees, texture of grasslands, riparian drainageways, and rock outcroppings.

The project helps reduce the open space visual quality impacts with the proposed Copper Mountain and Salado hill Conservation Areas. Site development in the upper hills which encroaches on these areas would have the most impact on open space visual resources from valley locations. The visual impact of the cul-de-sac homes east of Oak Flat Parkway could reasonably be considered as significant if not sensitively implemented.

The Preliminary Grading Plan indicates that grading would avoid benching or other visually disruptive grading techniques. The graded areas of significant concern are the attached single family areas in the west portion of the site. Due to the quantity of on-site trees, some tree removal could occur without significantly affecting the visual impression of the site's vegetative cover. The most prominent community buildings of significant concern would be the town center, shopping area, and hotel/convention center. Their potential visual impacts would depend on their orientation, building envelopes, and architecture. Visual impacts due to the appearance of siding and roofing material could be significant because insensitively chosen texture and color elements could bring undesirable attention to project development.

Overall Site

Introduction

Development of Villages 2 to 5 would occur after most or all of Phase 1 is completed. However, development of Villages 2 to 5 is visually screened from Village 1 and to all known off-site views. (The Isom Ranch property would be surrounded by the Wilcox Ridge Conservation Area). Consequently, although development would unavoidably affect visual quality, it would not impact existing inventories of County visual resources. The discussion of overall site visual impacts below is organized into two parts:

- Development and open space areas within the viewsheds in photographs 21 to 34 are identified in order to provide the visual site and landscape context of the project;
- Programatic overall site issues are evaluated.

Views of Villages 2 To 5

Village 2 would have 1,950 acres of development with 400 residences and a minimum of 760 acres of open space. Photograph 21 shows a southwest view of Village 2. The canyon between the hills would contain a two-lane collector roadway. The wooded hill in the far background would be in the Copper Mountain Conservation Area.

Village 3 would have 1,586 acres of development with 400 residences and 1,130 acres of open space. Photograph 22 shows a south view from the center of Village 3. The valley and foothills in the photograph would likely be the site of proposed residential units. Photograph 23 shows a south view from the southeast portion of Village 3. The valley would likely be the site of the a two-lane collector roadway and residences.

Village 4 would have 3,100 acres of development with 1,100 residences and 1,390 acres of open space. Photograph 24 shows a southeast view of a proposed split-level, two-lane collector roadway. Photograph 25 shows a view southeast which is closer to the Village 5 border. The valley in the photograph would likely have a proposed golf course, a two-lane collector roadway and residential units. The wooded hills in the background would be greenbelt open space between Villages 4 and 5, but would likely have residences on their north side.

Parts of the Village 4 southeast boundary are shown in photographs 26 to 29. Photograph 26 shows a northeast view which would include a two-lane collector roadway intersection. Photograph 27 shows a northwest view of Village 4, indicating wooded hills in the center of the proposed village. Photograph 28 shows a southwest view of the eastmost portion of Village 4 and would have a two-lane collector roadway instead of the current unpaved

road. The project site border and beyond is shown in the east view of photograph 29. The hills in the photograph are not part of the project site.

Village 5 would have 2,205 acres of development with 900 residences and 930 acres of open space. Photographs 30 and 31 are north and south views, respectively, from the ridge at the north border of Village 5. Photograph 30 shows Villages 1 to 4 and Copper Mountain. The proposed project development would be visible in this photograph, with Village 4 in the foreground. Photograph 31 shows part of Village 5.

Views from Orestimba Peak are shown in photographs 32 and 33. Photograph 32 shows a southeast view of the project site's southeastern border, which would be Conservation Areas and contain no proposed development. Photograph 33 shows a northwest view which includes most of the project site. The left portion of the photograph shows land adjacent to the project site, the center shows Wilcox Ridge which is the west border of the site. On the far right side of the photograph is Copper Mountain and in between Wilcox Ridge and Copper Mountain is Mike's Peak. The developments of the project would be visible from the photograph location, although the peaks would be Conservation Areas, thereby preventing development on the horizon.

Overall Site Visual Issues and Impacts

Internally, the project helps reduce the open space visual quality impacts with the proposed Wilcox Ridge, Orestimba, Copper Mountain, and Salado Conservation Areas.

The overall site contains a series of valleys smaller than Oak Flat, and, in several locations, has a more textured and rugged visual quality than Village 1. Nevertheless, programatic visual quality issues and potential impacts for the overall site are the same as many of the programatic-level issues associated with Phase 1:

- On-site elements which would be considered visually sensitive include prominent topographic features, ridgelines, vegetative cover, riparian drainageways, and rock outcroppings;
- The ultimate visual impression would result from preservation of key indigenous visual elements, sensitivity in resculpturing the land, intensity of landscaping, and the visual interest from a variety of building designs;
- Development in the upper hills would have the most impact on open space visual resources from valley locations;
- Grading would not be considered to be visually significant if the grading successfully is visually characteristic of existing forms;
- Some tree removal could occur without significantly affecting the visual impression of the site's vegetative cover;

- The numerous on-site rock outcroppings and areas of riparian vegetation are important elements of the site's visual integrity, providing natural focal points and texture;
- Sensitive choice of texture, paint color, and/or wood finish could help integrate project development into the landscape;
- To maintain the integrity of the existing landscape the project landscape plan must incorporate the elements of the existing vegetation in terms of size, color, and texture, so that new vegetation would eventually blend in with the existing species;

Overall Site Conclusions of Significance

Development would cause potential significant visual impacts, affecting the overall appearance of much of the site, and views of the future resident and visitor populations. Elements which would be considered visually sensitive and could be significantly affected by the project include the expansive open space, rolling topography, ridgelines, clusters and specimen trees, texture of grasslands, riparian drainageways, and rock outcroppings.

Development of estate lots and lots on the slopes on the periphery of the villages would have the most significant impact on visual quality.

Actual levels of significance of potential visual impacts would depend on how successfully development plans address grading, site planning, landscaping, building envelopes, and architecture.

Mitigation Measures

Phase 1 Mitigation

1. Final site, landscaping, and grading plans shall be sensitive to on-site landforms and features which provide the site with its visual impressions, including its rolling topography, ridgelines, clusters and specimen trees, riparian drainageways, and rock outcroppings. To maintain the integrity of the existing landscape the project landscape plan must incorporate the elements of the existing vegetation in terms of size, color, and texture, so that new vegetation would eventually blend in with the existing indigenous species. Screening vegetation must be strategically placed. Architectural detailing shall include sensitive choices of texture, paint color, and/or wood finish to help integrate project development into the landscape.

2. To mitigate future visual impacts of the Oak Flat Parkway, any future proposals to the County adversely affecting the viewshed of Oak Flat Road shall address the heightened perception of public concern due to build-out of the Diablo Grande project.

3. To protect the visual quality of the expansive areas of open space east of Oak Flat Parkway, the four development areas in Phase 1 east of Oak Flat Parkway shall be given special treatment to ensure that significant oak cover is not removed, and that the bases of the adjoining hills are contoured or feathered to retain a natural appearance.

4. To avoid impacts associated with the most prominent project buildings, photomontage or CADD graphics simulations shall be prepared to the satisfaction of the Planning Director showing the town center, shopping area and/or other structures from key viewpoints. Final plans shall incorporate any mitigation measures resulting from these montages.

Overall Site Mitigation Measures

5. Phase 1 mitigation measure 1 is applicable to the overall site, and shall be implemented at the time final plans are prepared for Villages 2 to 5.

6. Photomontage simulations or CADD graphics shall be prepared of visible development from key viewpoints to the satisfaction of the Planning Director. Final plans shall incorporate any mitigation measures resulting from these montages.

H. TRAFFIC/CIRCULATION

The traffic/circulation analysis for the Draft Specific Plan was prepared by Dowling Associates (November 1991). The traffic study (contained in its entirety in Appendix C, section 1) incorporates extensive amounts of data from the Lakeborough DEIR and the Transportation Element of the Draft General Plan for the City of Patterson. The modification of the project definition to include a new primary access road between Oak Flat Road and Del Puerto Canyon Road required a revised analysis. The revised analysis is included in Appendix C, section 2.

Setting

The project site is located in the southwest corner of Stanislaus County approximately nine miles west of Interstate 5 (I-5) on Oak Flat Road. Oak Flat Road intersects Ward Road to the east of I-5. No freeway interchange with I-5 is provided at Oak Flat Road. Rather, Ward Avenue, to the north, accesses I-5 at the Sperry Ave/I-5 interchange west of the City of Patterson and to the south at the Fink Road/I-5 interchange west of the community of Crows Landing.

Existing Street System

Oak Flat Road - Oak Flat Road is a two-lane rural road and is not constructed to County standards. East of I-5, Oak Flat Road is a paved facility with no shoulders or pavement edge. The current roadway appears to be able to accommodate three travel lanes. Power poles are located along both sides of Oak Flat Road. In general, there is very limited development along Oak Flat Road.

At the eastern terminus, Oak Flat Road intersects Ward Avenue, with stop sign control provided on the eastbound approach of Oak Flat Road. Just east of I-5, Oak Flat Road crosses the California Viaduct on a two lane bridge. At I-5, Oak Flat Road crosses under the freeway. The current bridge structure does not provide adequate room for roadway widening. To the west of I-5, Oak Flat Road narrows to about 20 feet and is un-paved. Oak Flat Road carries very low levels of daily and peak-hour traffic.

Ward Avenue - Ward Avenue is a north-south two-lane rural road. The road has a center yellow stripe with no developed shoulders or roadway edge. However, at the northern end of Ward near Sperry Avenue, Ward Avenue widens to provide a four-lane roadway constructed to County standards. Ward Avenue intersects Sperry Road to the north and Fink Road to the south. Ward Avenue accommodates 400 daily trips to the south of Oak Flat Road and 700 daily trips to the north. Peak-hour traffic approaches about 50 trips.

Sperry Road - Sperry Road is a two lane east-west rural road which connects I-5 to the west with the City of Patterson and Highway 33 to the east. Highway 33 is a north-south highway about 3 miles to the east of the I-5. The I-5/Sperry Road interchange is a diamond interchange with Sperry Road crossing under I-5. Stop sign controls are provided at the terminus of the I-5 off-ramps. Sperry Road carries about 2,800 daily and 260 peak hour trips near I-5.

Fink Road - Fink Road is a two-lane east-west rural road through the community of Crows Landing. Fink Road extends from I-5 on the west to Highway 33 to the east. The I-5/Fink Road interchange is a diamond interchange with Fink Road crossing under I-5. Stop sign controls are provided at the terminus of the off-ramps. Fink Road carries about 1,440 daily and 120 peak hour trips near I-5.

I-5 Freeway - North-south highway access to the project is provide by I-5. Near the project, I-5 has two lanes in each direction separated by a median approximately 70 feet wide. The median in this area would have room enough for two more lanes in each direction. Between Sperry Road and Fink Road, I-5 carries about 21,200 daily and 3,000 peak hour trips.

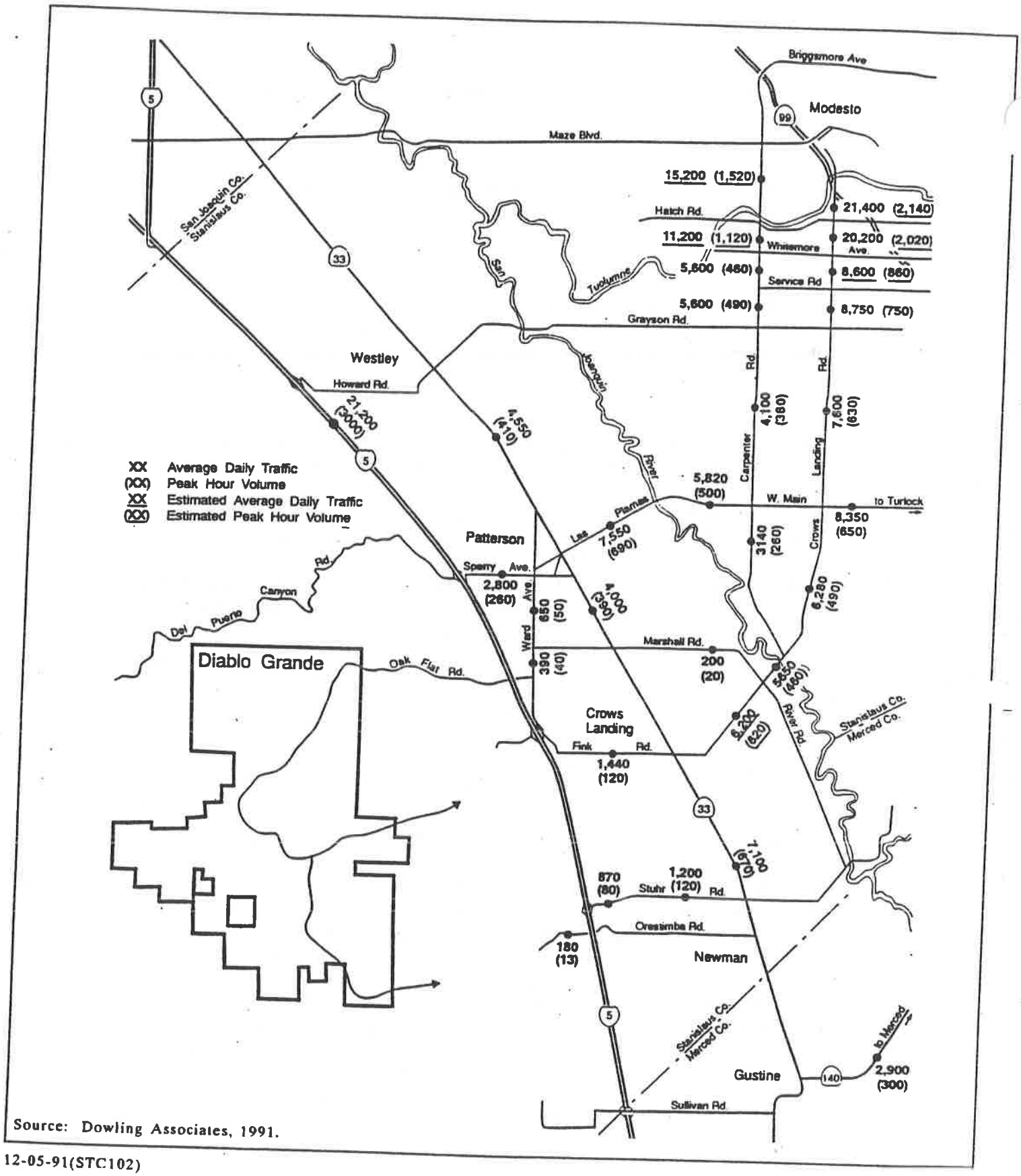
Highway 33 - To the east of I-5, regional access is provided by State Route 33. Route 33 connects the communities of Newman at the southwestern end of the County to Grayson at the northwestern end of the County. In the vicinity of the project, Route 33 has one lane in both the north and south directions, except in Patterson where Route 33 widens to two directional lanes.

Existing Traffic Conditions

The land along Oak Flat Road and adjacent to the other rural streets which access the site is generally undeveloped. Therefore, the existing traffic levels of service are very good. All of the freeway interchanges operate at good levels of service. The major interchanges which would be impacted by this project are at Sperry Road/I-5 and Fink Road/I-5. While some project traffic may use the Stuhr Road/I-5 interchange, the impacts would likely be minimal. The observed existing level of service within the interchange is "A".

Figure IV.H-1 shows the existing average daily and peak hour traffic levels on the roadways in the vicinity of the project site. These volumes were provided by the Stanislaus Area Association of Governments (SAAG), Stanislaus County, and the Caltrans 1989 Traffic Volumes on California State Highways.

Examination of existing daily traffic volumes indicates that all roadways are currently operating at acceptable levels of service, except for the following:



Source: Dowling Associates, 1991.

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Figure IV.H-1

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Existing Traffic Volumes

- *Crows Landing Road* - Crows Landing Road is currently a two lane rural roadway. The section of Crows Landing Road from West Main Street to north of Grayson Road is currently operating at unacceptable levels of service, and would need to be widened to four lanes to improve levels of service.

- *Highway 33* - Highway 33 in the vicinity of the project site is currently a two lane roadway. Existing volumes between Crows Landing Road and Newman are at the upper threshold of acceptability.

Peak hour traffic turn movement counts were not conducted for any of the freeway interchange or other local intersections. Limited data is available for PM peak hour conditions at the Sperry Road/I-5 interchange. No data is available at I-5 and Fink Road or Stuhr Roads. As these intersections serve rural areas, the existing traffic volumes at these locations are estimated to be very low.

The traffic analysis examines the AM and PM peak hour levels of service at nine intersections in the vicinity of the project site (seven existing intersections and two proposed intersections). These intersections are:

- I-5 SB ramps at Sperry Road
- I-5 NB ramps at Sperry Road
- Sperry Road at Ward Avenue
- Ward Avenue at Marshall Road
- Ward Avenue at Oak Flat Road
- I-5 SB ramps at Fink Road
- I-5 NB ramps at Fink Road
- I-5 SB ramps at the proposed Ward Avenue interchange
- I-5 NB ramps at the proposed Ward Avenue interchange

The two intersections at I-5 and Ward Avenue were proposed as part of the Lakeborough DEIR traffic assessment. The Diablo Grande Specific Plan assumes that the Lakeborough traffic mitigation measures are in place at full build out of the Diablo Grande project.

Field observations of peak hour conditions confirm that all of the existing analysis intersections operate at level of service (LOS) "A" or better during the AM and PM peak hours.

Potential Impacts

Project Traffic Characteristics

This section discusses the project impacts of the proposed project. The traffic assessment evaluates a number of scenarios which assume both the existing and proposed street system configurations near the site.

The project will include 5,000 residential units plus various support shopping, commercial and recreational uses. The project also would include a resort complex with assorted recreational uses such as golf courses, spas, health center and other amenities.

The traffic impact analysis evaluated the trip generation potential for Phase 1 and full buildout of the project. Phases 2 and 3 were not evaluated separately. For the Phase 1 analysis, project access is provided only along Oak Flat Road and the proposed New Access Road. For the full buildout option, access is provided along New Access Road, Oak Flat Road, through the Lakeborough project to the proposed interchange at Ward Avenue and I-5, and to I-5 at Stuhr Road via Orestimba Road.

Trip Generation

The trip generation rates applied to the project were developed and approved by the County using three sources:

1. The Institute of Traffic Engineers (ITE) *Trip Generation* (Fifth Edition)
2. The City of San Diego *Traffic Generators*
3. Dowling Associates research.

The daily and direction AM and PM peak-hour trip rates are summarized Table IV.H-A. The resulting daily and AM and PM peak-hour trip generation for the proposed project are also summarized in Table IV.H-A. As this table indicates, the project is estimated to generate about 53,000 daily trips and 3,600 AM and 5,200 PM peak hour trips. Of these trips, a portion would stay on-site and travel between the residential and non-residential uses. The remaining traffic would travel to and from off-site destinations.

It should be noted that the trip generation data assumes a housing mix by product type (single family detached, single family attached and multiple family) and by type of resident (permanent, retirement and seasonal). A detailed discussion of these assumptions are contained in Appendix C.

On- and Off-site Traffic Allocation

A spreadsheet model was developed to calculate the on- and off-site trip generation for the project area. The model allocates land uses and intensities to each of the project development areas (i.e. Oak Flat and Copper Mountain). The model assumes that all of the residential uses produce traffic, while all of the recreational, resort, shopping center, town center, hotel and other non-residential development attract traffic. The model uses an input value for the percent of off-site commute housing stock to evaluate the balance between off-site and on-site traffic. Once the off-site (inbound and outbound) traffic levels have been calculated, the model

estimates the required levels of off-site (inbound and outbound) traffic to and from the non-residential areas to produce a balance between total residential and non-residential traffic generation.

The input value for the percent the project housing stock which would commute off-site is 57.34 percent. Appendix C provides a detailed summary of the development of this factor.

Using the above methodology, the traffic generated by the proposed project was allocated to on-site and off-site origins and destinations. Once the total traffic volumes were determined, the off-site traffic components for residential and non-residential traffic were allocated to specific access routes. The technical appendix section of Appendix C includes the trip generation model runs for the proposed project development phase. Table IV.H-A summarizes the off-site trip generation values and Table IV.H-B summarizes route allocation.

Trip Distribution and Assignment Patterns

Trip distribution and assignment assumptions for the proposed project were developed based on review of the Lakeborough project's off-site trip distribution factors for residential and non-residential traffic. The various trip distribution values were adjusted to reflect access and egress from the Diablo Grande project. The following trip distribution values were applied for the daily and peak hour traffic analysis.

Off-site residential based trip distribution (vehicle trips originating from residential development within Diablo Grande) is assumed as follows:

- North on I-5 = 75%
- South on I-5 = 5%
- East to Newman = 2%
- North along Ward to Patterson = 3%
- East to W. Main and Turlock = 5%
- East to Carpenter Road into Modesto = 2.5%
- East to Crows Landing Road into Modesto = 7.5%

Off-site non-residential based trip distribution (vehicle trips generated by non-residential development within Diablo Grande) is assumed as follows:

- North on I-5 = 20%
- South on I-5 = 20%
- East to Newman = 15%
- North along Ward to Patterson = 5%
- East to W. Main and Turlock = 10%
- East to Carpenter Road into Modesto = 6%
- East to Crows Landing Road into Modesto = 19%

Table IV.H-A - Trip Generation Summary

Trip Generation Rates				AM PEAK HOUR			PM PEAK HOUR		
Land Uses	Units	Quant.	Daily	In	Out	Total	In	Out	Total
Single Family	du	2,123.00	9.55	0.19	0.55	0.74	0.65	0.35	1.00
Attached Single Family	du	637.00	5.86	0.07	0.37	0.44	0.36	0.19	0.55
Multiple Family	du	500.00	6:47	0.09	0.42	0.51	0.43	0.20	0.63
Seasonal/Retirement SF/ASF	du	1,190.00	3.16	0.11	0.05	0.16	0.11	0.15	0.26
Seasonal/Retirement MF	du	550.00	3.16	0.11	0.05	0.16	0.11	0.15	0.26
Shopping Center/Town Ctr	ksf	122.00	28.27	0.32	0.32	0.64	1.31	1.31	2.62
Office	ksf	52.00	16.31	1.92	0.29	2.21	0.35	1.86	2.21
Research Campus	ksf	226.00	8.00	1.15	0.13	1.28	0.11	1.01	1.12
Hotel	rooms	240.00	10.00	0.36	0.24	0.60	0.32	0.48	0.80
Restaurants	ksf	10.00	96.51	0.86	0.08	0.94	5.36	2.30	7.66
Public Services	ksf	40.00	0.79	0.41	0.07	0.48	0.06	0.34	0.40
Shopping Center/Town Ctr	ksf	76.23	28.27	0.32	0.32	0.64	1.31	1.31	2.62
Golf Course	acres	899.00	8.00	0.38	0.10	0.48	0.22	0.50	0.72
Equestrian	acres	24.00	5.00	0.10	0.10	0.20	0.20	0.20	0.40
Parks	acres	242.00	5.00	0.10	0.10	0.20	0.20	0.20	0.40

Trip Generation				AM PEAK HOUR			PM PEAK HOUR		
Land Uses	Units	Quant.	Daily	In	Out	Total	In	Out	Total
Single Family	du	2,123.00	20,275	403	1,168	1,571	1,380	743	2,123
Attached Single Family	du	637.00	3,733	45	236	281	229	121	350
Multiple Family	du	500.00	3,235	45	210	255	215	100	315
Seasonal/Retirement SF/ASF	du	1,190.00	3,760	131	60	191	131	179	310
Seasonal/Retirement MF	du	550.00	1,738	61	28	89	61	83	144
Shopping Center/Town Ctr	ksf	122.00	3,449	39	40	79	160	160	320
Office	ksf	52.00	848	100	15	115	18	97	115
Research Campus	ksf	226.00	1,808	260	29	289	25	228	253
Hotel	rooms	240.00	2,400	86	58	144	77	115	192
Restaurants	ksf	10.00	965	9	1	10	54	23	77
Public Services	ksf	40.00	32	16	3	19	2	14	16
Shopping Center/Town Ctr	ksf	76.23	2,155	24	25	49	100	100	200
Golf Course	acres	899.00	7,192	342	90	432	198	450	648
Equestrian	acres	24.00	120	2	2	4	5	5	10
Parks	acres	242.00	1,210	24	24	48	48	48	96
TOTALS			52,920	1,587	1,989	3,576	2,703	2,466	5,169

du = dwelling units
ksf = 1,000 square feet

Table IV.H-B - Trip Generation Allocation

Development Condition	Average Daily	AM PEAK HOUR In	AM PEAK HOUR Out	AM PEAK HOUR Total	PM PEAK HOUR In	PM PEAK HOUR Out	PM PEAK HOUR Total
Total Traffic Generation							
Phase 1	21,794	635	830	1,465	1,110	974	2,084
Total Project	52,920	1,587	1,988	3,575	2,701	2,467	5,168
Off-Site Traffic Generation							
Phase 1	9,410	210	405	615	532	409	941
Total Project	24,010	587	988	1,575	1,343	1,058	2,401
Allocation to Access Routes (Total Project)							
Oak Flat Road to Del Puerto Canyon Road and Ward Avenue	13,762	350	561	911	750	626	1,376
Crow Creek via Lakeborough	6,048	143	240	383	348	257	605
Stuhr Road via Orestimba Road	4,200	94	187	281	245	175	420

Figure IV.H-2 illustrates the average daily traffic levels generated by the project as assigned to the surrounding street system using the above trip assignment patterns.

Cumulative Traffic Conditions

To develop cumulative traffic conditions, Dowling Associates reviewed the cumulative traffic analysis conducted for the Lakeborough development. For that EIR, TJKM used the SAAG model, updated it for all of the projects not included in the 2010 land use, and refined the estimate of through traffic along the I-5 corridor. The Lakeborough EIR included the traffic generated by the following projects:

- 2010 build out of the County General Plan and its incorporated cities.
- Grayson Park
- Mapes Ranch

In addition, the cumulative base for the Lakeborough EIR included refined projections for I-5 provided by Merced County and San Joaquin County.

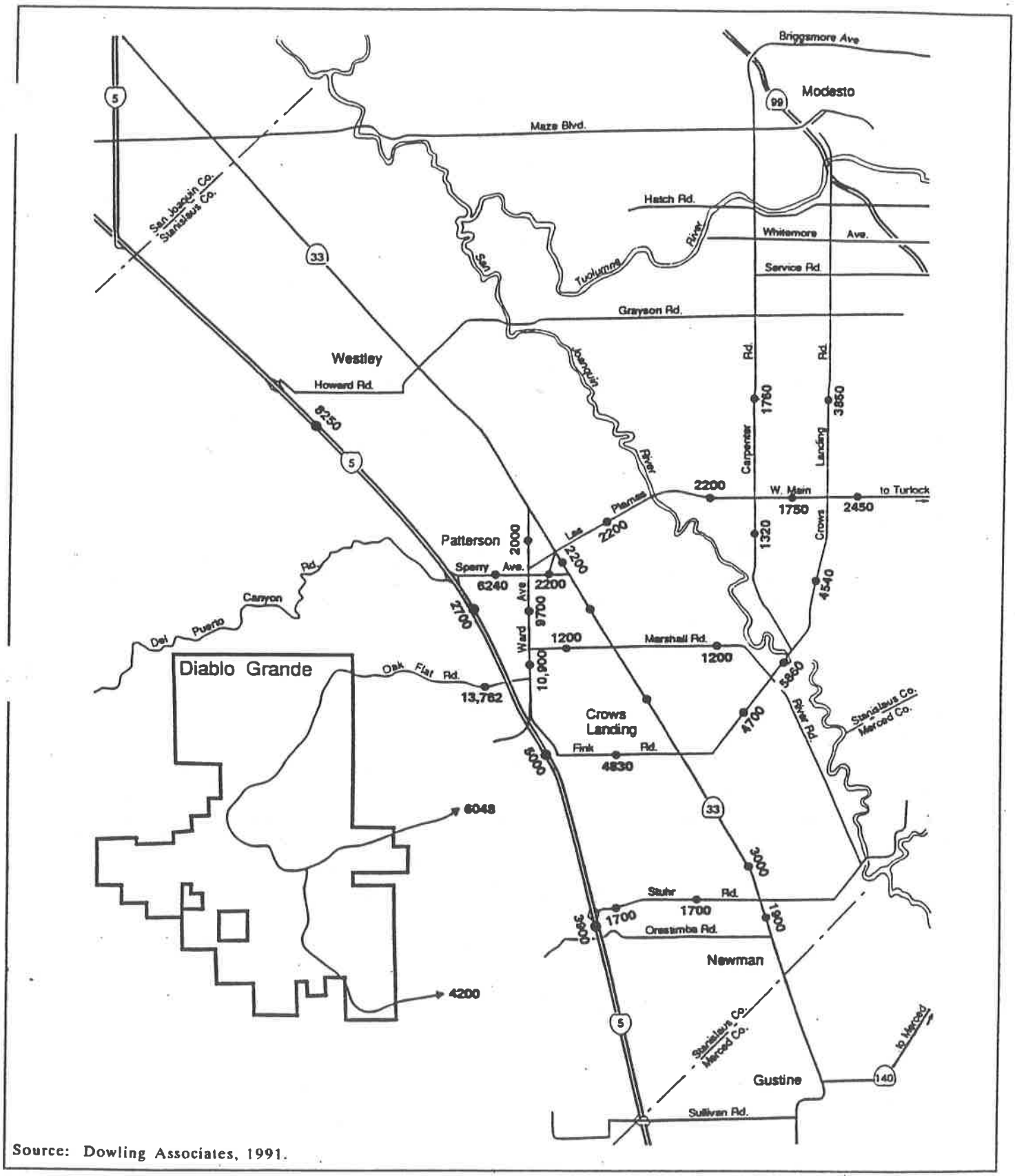
To produce a more realistic forecast for off-site daily and peak hour traffic, the following process to estimate the cumulative traffic conditions was used.

- The 2010 daily and peak-hour traffic forecasts provided in the Lakeborough EIR for the "with and without" Lakeborough project condition were used as the basic cumulative traffic projections for the study area streets.

- The growth in daily traffic projected for the build out of Patterson was added to the Lakeborough EIR projections to evaluate basic roadway travel lane requirements.

- For the peak hour analysis, the traffic projections from the Lakeborough EIR were supplemented with peak hour adjustments of the Patterson General Plan daily traffic projections. While no peak hour traffic assessment was included in the Patterson General Plan analysis, Dowling Associates applied a 10 percent peak hour and 67/33 and 33/67 percent directional splits to estimate the AM and PM peak hour traffic volumes, respectively, for build out of the Patterson General Plan.

- The daily traffic from the Diablo Grande trip generation analysis was added to the above projections to produce the 2010 with project condition.



Source: Dowling Associates, 1991.

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Figure IV.H-2

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Daily Project Traffic Volumes

- Peak hour traffic volumes from the project were added to the above data to produce the existing plus project and cumulative plus project conditions. For the cumulative analysis, two options were considered: 1) a cumulative without Lakeborough; and 2) a cumulative with Lakeborough. For the first, the development of the Lakeborough project was added to the cumulative plus project conditions for full build out. For the second, the Lakeborough development was included in the cumulative and the Diablo Grande project added to estimate full build out.

Figure IV.H-3 illustrates the average daily traffic volumes assumed for the cumulative traffic conditions without Lakeborough. Figure IV.H-4 illustrates the average daily traffic volumes assumed for the cumulative traffic conditions with Lakeborough.

Traffic Impacts

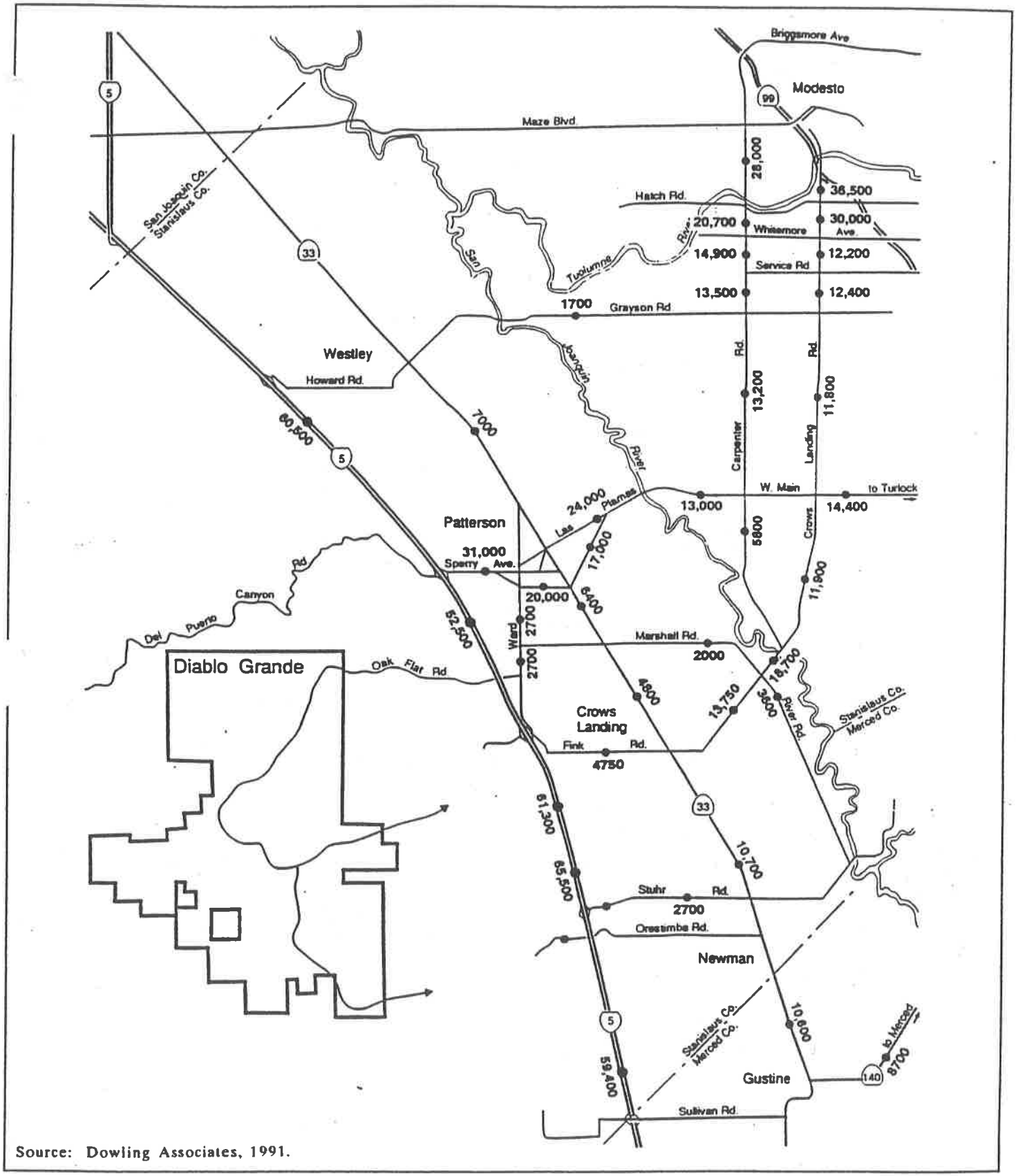
The traffic generated by the project was added to the surrounding street system to determine the off-site impacts. Two levels of impact were addressed. These include: 1) changes in average daily traffic volumes and the resulting levels of service, and 2) intersection levels of service at selected intersections near the site.

Daily Traffic Impacts

The daily capacity of streets serving the project were used to determine the number of travel lines for each roadway segment. The capacities were extracted from the City of Patterson General Plan. They were reviewed and found to compare to the *Highway Capacity Manual* (HCM) and Caltrans standards. Table IV.H-C summarizes the capacities at level of service "C", "D" and "E" for freeways, expressways, City streets, and rural highways.

Table IV.H-D summarizes the average daily traffic volumes for various roadway segments affected by the project. This table summarizes six development scenarios:

1. Existing conditions
2. Existing plus project
3. Cumulative without Lakeborough (and without project)
4. Cumulative plus project without Lakeborough
5. Cumulative with Lakeborough (and without project)
6. Cumulative with Lakeborough with project.



Source: Dowling Associates, 1991.

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Figure IV.H-3

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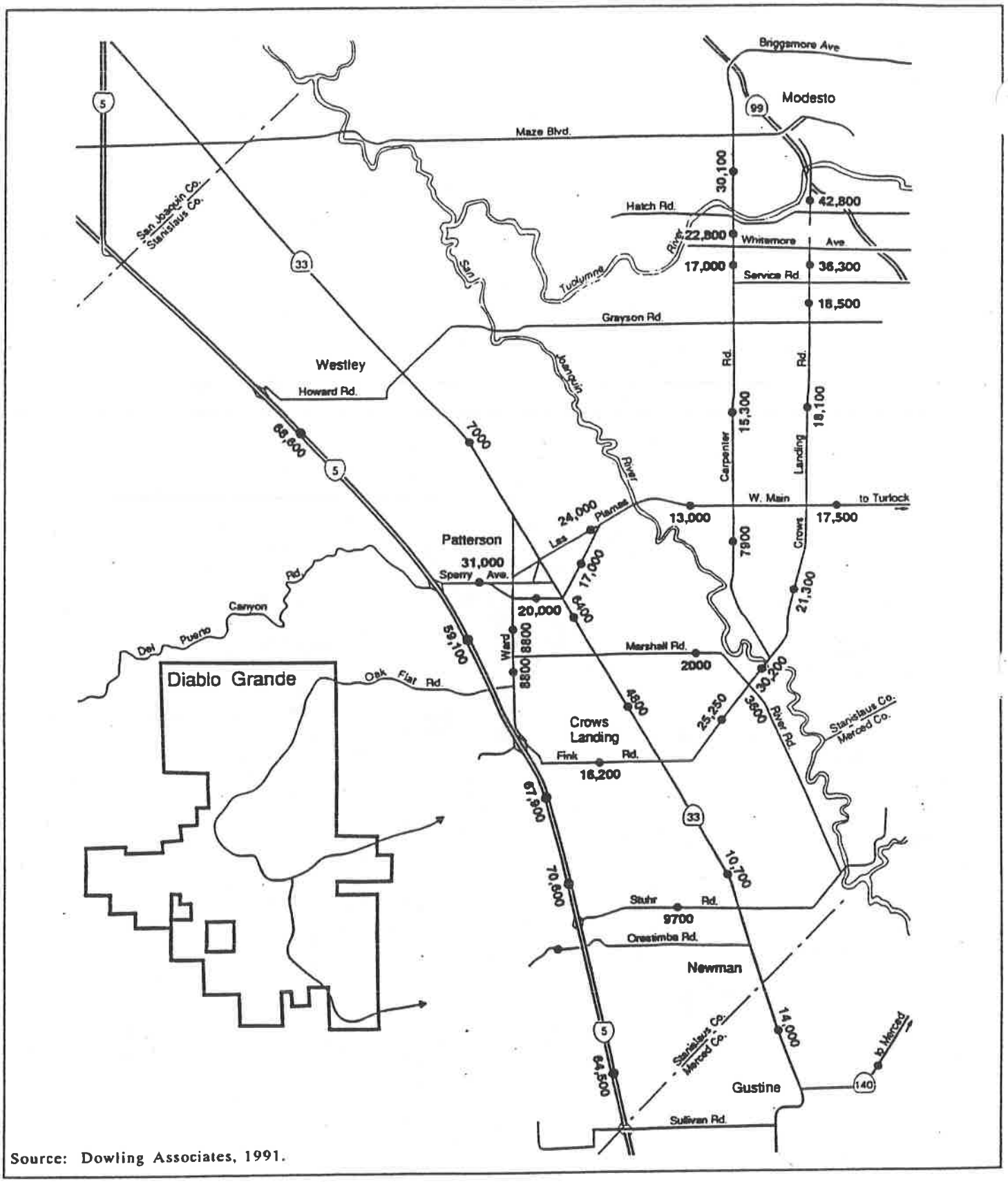
Cumulative Daily Traffic Volumes - without Lakeborough, without Project



Source: Dowling Associates, 1991.

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Figure IV.H-4

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Cumulative Daily Traffic Volumes - with Lakeborough, without Project

Table IV.I-A - Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone	1-hour	0.12 ppm	0.09 ppm
Carbon Monoxide	1-hour	35.0 ppm	20.0 ppm
	8-hour	9.0 ppm	9.0 ppm
Nitrogen Dioxide	1-hour	—	0.25 ppm
	annual	0.05 ppm	—
Sulphur Dioxide	1-hour	—	0.5 ppm
	24-hour	0.14 ppm	0.05 ppm
	annual	0.03 ppm	—
PM^{10}	24-hour	150 ug/m^3	50 ug/m^3
	annual	50 ug/m^3	30 ug/m^3

ppm = parts per million, ug/m^3 = micrograms per cubic meter

SOURCE: California Air Resources Board

Table IV.I-B - Health Effects Summary of the Major Criteria Air Pollutants

Air Pollutant	Adverse Effects
Ozone	- eye irritation - respiratory function impairment
Carbon Monoxide	- impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin - aggravation of cardiovascular disease - impairment of central nervous system function - fatigue, headache, confusion, dizziness - can be fatal in the case of very high concentrations in enclosed places
Sulfur Dioxide	- aggravation of chronic obstructive lung disease - increased risk of acute and chronic respiratory illness
Nitrogen Dioxide	- risk of acute and chronic respiratory disease
Suspended Particulates	- increased risk of chronic respiratory disease with long exposure - altered lung function in children - with SO_2, may produce acute illness - particulate matter 10 microns or less in size (PM_{10}) may lodge in and/or irritate the lungs

Table IV.H-D - Forecast Daily Traffic Volumes (Continued)

Development Scenarios	Average Daily Traffic	Required Number of Travel Lanes
Ward Avenue South of Oak Flat Road		
Existing	390	2
Existing Plus Project	4,630	2
Cumulative No Lakeborough No Project	2,700	2
Cumulative No Lakeborough With Project	7,240	4
Cumulative With Lakeborough No Project	8,800	4
Cumulative With Lakeborough With Project	13,040	4
Marshall Road East of Ward Avenue		
Existing	200	2
Existing Plus Project	1,400	2
Cumulative No Lakeborough No Project	2,000	2
Cumulative No Lakeborough With Project	3,200	2
Cumulative With Lakeborough No Project	2,000	2
Cumulative With Lakeborough With Project	3,200	2
Fink Road East of Ward Avenue		
Existing	1,440	2
Existing Plus Project	6,270	2
Cumulative No Lakeborough No Project	4,750	2
Cumulative No Lakeborough With Project	9,580	4
Cumulative With Lakeborough No Project	16,200	4
Cumulative With Lakeborough With Project	21,030	4
Stuhr Road East of I-5		
Existing	870	2
Existing Plus Project	2,570	2
Cumulative No Lakeborough No Project	2,700	2
Cumulative No Lakeborough With Project	4,400	2
Cumulative With Lakeborough No Project	9,700	4
Cumulative With Lakeborough With Project	11,400	4
West Main West of Carpenter		
Existing	5,820	2
Existing Plus Project	8,020	2
Cumulative No Lakeborough No Project	13,000	4
Cumulative No Lakeborough With Project	15,200	4
Cumulative With Lakeborough No Project	13,000	4
Cumulative With Lakeborough With Project	15,200	4
Crows Landing Road East of Highway 33		
Existing	6,200	2
Existing Plus Project	10,900	4
Cumulative No Lakeborough No Project	13,750	4
Cumulative No Lakeborough With Project	18,450	4
Cumulative With Lakeborough No Project	25,250	6
Cumulative With Lakeborough With Project	29,950	6

Table IV.H-D - Forecast Daily Traffic Volumes (Continued)

LSA Associates, Inc.

Development Scenarios	Average Daily Traffic	Required Number of Travel Lanes
Highway 33 South of Crows Landing Road		
Existing	7,100	2+
Existing Plus Project	10,100	4
Cumulative No Lakeborough No Project	10,700	4
Cumulative No Lakeborough With Project	13,700	4
Cumulative With Lakeborough No Project	10,700	4
Cumulative With Lakeborough With Project	13,700	4
Highway 33 South of Newman		
Existing	7,100	2+
Existing Plus Project	7,100	2+
Cumulative No Lakeborough No Project	10,600	4
Cumulative No Lakeborough With Project	10,600	4
Cumulative With Lakeborough No Project	14,100	4
Cumulative With Lakeborough With Project	14,100	4
Crows Landing Road North of Marshall Road		
Existing	5,650	2
Existing Plus Project	11,510	4
Cumulative No Lakeborough No Project	18,700	4
Cumulative No Lakeborough With Project	24,560	4
Cumulative With Lakeborough No Project	30,200	6
Cumulative With Lakeborough With Project	36,060	6
Crows Landing Road North of West Main		
Existing	7,600	4
Existing Plus Project	11,450	4
Cumulative No Lakeborough No Project	11,800	4
Cumulative No Lakeborough With Project	15,650	4
Cumulative With Lakeborough No Project	18,100	4
Cumulative With Lakeborough With Project	21,950	4
Crows Landing Road North of Grayson Road		
Existing	8,750	4
Existing Plus Project	12,600	4
Cumulative No Lakeborough No Project	12,400	4
Cumulative No Lakeborough With Project	16,250	4
Cumulative With Lakeborough No Project	18,400	4
Cumulative With Lakeborough With Project	22,250	4
Carpenter Road North of Crows Landing Road		
Existing	3,140	2
Existing Plus Project	4,460	2
Cumulative No Lakeborough No Project	5,800	2
Cumulative No Lakeborough With Project	7,120	4
Cumulative With Lakeborough No Project	7,900	4
Cumulative With Lakeborough With Project	9,220	4

Table IV.H-D - Forecast Daily Traffic Volumes (Continued)

Development Scenarios	Average Daily Traffic	Required Number of Travel Lanes
Carpenter Road North of West Main		
Existing	4,100	2
Existing Plus Project	5,860	2
Cumulative No Lakeborough No Project	13,200	4
Cumulative No Lakeborough With Project	14,950	4
Cumulative With Lakeborough No Project	15,300	4
Cumulative With Lakeborough With Project	17,060	4
Carpenter Road North of Grayson Road		
Existing	5,600	2
Existing Plus Project	7,360	4
Cumulative No Lakeborough No Project	13,500	4
Cumulative No Lakeborough With Project	15,260	4
Cumulative With Lakeborough No Project	17,000	4
Cumulative With Lakeborough With Project	18,760	4

The table reflects the roadway requirements for level of service "C". The rural highway criteria were generally applied to the existing plus project condition along Ward Avenue, Fink Road, Crows Landing Road, Carpenter, Stuhr Road, and Highway 33.

The Lakeborough EIR suggests that a portion of the cumulative traffic would include trips generated by Lakeborough. Therefore, some of the roadways show no increase in traffic between the "with and without" Lakeborough development conditions. For the Diablo Grande project, the total increment of project traffic is added to produce a worse case projection. It should be noted, however, that a portion of the cumulative traffic growth in Patterson and within the I-5 corridor would be associated with the development of Diablo Grande. Therefore, the traffic projections for the project-plus-cumulative conditions could be overstated.

Existing Plus Total Project. As Table IV.H-D indicates, the following improvements would be needed to improve existing traffic conditions to acceptable levels of service:

- *Crows Landing Road* - Crows Landing Road is currently a two lane rural roadway. The sections of Crows Landing Road from West Main Street to north of Grayson Road is currently operating at unacceptable levels of service, and would need to be widened to four lanes to improve levels of service.

With the addition of project traffic, acceptable levels of service for all off-site roadways can be maintained without major street widening, except for the following:

- *Crows Landing Road* - Crows Landing Road is currently a two lane rural roadway. The sections of Crows Landing Road from West Main Street to north of Grayson Road is currently operating at unacceptable levels of service, and would need to be widened to four lanes to improve levels of service. Addition of project traffic to Crows Landing Road would result in unacceptable levels of service from Highway 33 to north of Grayson Road. Improvement to acceptable levels of service would require widening of the entire length of Crows Landing Road from Highway 33 to north of Grayson Road to four lanes.

- *Highway 33* - Highway 33 in the vicinity of the project site is currently a two lane roadway. Existing volumes between Crows Landing Road and Newman are at the upper threshold of acceptability. The addition of project traffic would result in unacceptable levels of service along the section of Highway 33 between Crows Landing Road and Stuhr Road. Improvement to acceptable levels of service would require widening of this section of Highway 33 to four lanes.

- *Carpenter Road* - Carpenter Road is currently a two lane roadway. Addition of project traffic would result in unacceptable levels of service along the section of Carpenter Road north of Grayson Road. Improvement to acceptable levels of service would require widening of this section of Carpenter Road to four lanes.

Cumulative Without Lakeborough Plus Total Project. Analysis of cumulative conditions without development of the Lakeborough project indicates that a number of roadways will operate at unacceptable levels of service prior to the addition of Diablo Grande traffic. These roadways and the improvements which would be needed to improve operations to acceptable levels of service are:

- *Sperry Road* - Sperry Road east of I-5 would need to be widened to six lanes.

- *Las Palmas Road* - Las Palmas Road east of Highway 33 would need to be widened to four lanes.

- *West Main Street* - West Main Street west of Carpenter Road would need to be widened to four lanes.

- *Crows Landing Road* - Crows Landing Road from Highway 33 to north of Grayson Road would need to be widened to four lanes.

- *Highway 33* - Highway 33 from Crows Landing Road to Newman would need to be widened to four lanes.

- *Carpenter Road* - Carpenter Road north of West Main Street would need to be widened to four lanes.

With the addition of project traffic to cumulative conditions, unacceptable levels of service would occur along the following roadways:

- *I-5* - I-5 in the vicinity of the project site is currently a four lane facility. Under cumulative conditions (without Lakeborough), four lanes would continue to be adequate to accommodate projected traffic levels. Traffic generated by the proposed project would result in unacceptable levels of service under existing geometrics. To improve operations to acceptable levels of service, the freeway would need to be widened from four to six lanes. While it is possible that a portion of the cumulative traffic would include traffic from Diablo Grande, the project traffic was added to the projected cumulative traffic to produce a worse case scenario.

- *Ward Avenue* - Ward Avenue is currently a two lane roadway. Under cumulative conditions (without Lakeborough), two lanes would continue to be adequate to accommodate forecasted traffic volumes.

Addition of traffic generated by the proposed project would result in unacceptable levels of service along Ward Avenue south of Oak Flat Road. Improvement of operations to acceptable levels of service would require widening of this section of Ward Avenue to four lanes.

- *Fink Road* - Fink Road is currently a two lane roadway. Under cumulative conditions (without Lakeborough), two lanes would continue to be adequate to accommodate forecasted traffic volumes. Addition of traffic generated by the proposed project would result in unacceptable levels of service along Fink Road east of Ward Avenue. Improvement of operations to acceptable levels of service would require widening of this section of Ward Avenue to four lanes.

- *Carpenter Road* - Carpenter Road between West Main Street and Crows Landing Road is currently a two lane roadway. Under cumulative conditions (without Lakeborough), two lanes would continue to be adequate to accommodate forecasted traffic volumes. Addition of traffic generated by the proposed project would result in unacceptable levels of service along this section of Carpenter Road. Improvement of operations to acceptable levels of service would require widening of Carpenter Road between West Main Street and Crows Landing Road to four lanes.

Acceptable levels of service for the remaining roadways can be maintained with the number of lanes required for the cumulative condition without project condition. The project does not produce a demand for more travel lanes.

Cumulative With Lakeborough Plus Total Project. Analysis of cumulative conditions with development of the Lakeborough project indicates that a number of roadways will operate at unacceptable levels of service prior to the addition of Diablo Grande traffic. These roadways and the improvements which would be needed to improve operations to acceptable levels of service are:

- *I-5* - I-5 in the vicinity of the project site would need to be widened to six lanes.

- *Sperry Road* - Sperry Road east of I-5 would need to be widened to six lanes.

- *Las Palmas Road* - Las Palmas Road east of Highway 33 would need to be widened to four lanes.

- *Ward Avenue* - Ward Avenue between Sperry Road and Fink Road would need to be widened to four lanes.

- *Fink Road* - Fink Road east of Ward Avenue would need to be widened to four lanes.

- *Stuhr Road* - Stuhr Road east of I-5 would need to be widened to four lanes.

- *West Main Street* - West Main Street west of Carpenter Road would need to be widened to four lanes.

- *Crows Landing Road* - Crows Landing Road from Highway 33 to West Main Street would need to be widened to six lanes. Crows Landing Road from West Main Street to north of Grayson Road would need to be widened to four lanes.

- *Highway 33* - Highway 33 from Crows Landing Road to Newman would need to be widened to four lanes.

- *Carpenter Road* - Carpenter Road north of West Main Street would need to be widened to four lanes.

With the addition of project traffic, acceptable levels of service for all roadways in the vicinity of the project site can be maintained with the number of lanes required for the cumulative condition without project condition. The project does not produce a demand for more travel lanes.

Peak Hour Levels of Service

The peak hour level of service analysis uses the Transportation Research Board *Circular 212* "Planning" method to calculate intersection levels of service (LOS). The current County policy for intersection operations considers level of service "C" or better as acceptable intersection operations.

Peak traffic flows at intersections are regarded as the most important focus in analysis of traffic conditions and the development of adequate traffic management programs. Intersection operations are characterized in terms of "level of service". For signalized intersections, levels of service (LOS) range from "A" to "F", with LOS "A" representing free flow with little or no delay and LOS "F" representing jammed conditions. Generally, levels of service "A" through "C" indicate acceptable conditions at signalized intersections, and level of service "D" is usually considered the lowest acceptable LOS on urban streets. Table IV.H-E describes the various LOS categories for signalized intersections. At un-signalized intersections, similar level of service grades are assigned, but are calculated and interpreted differently. Levels of service are assigned to individual turning movements. Consequently, it is possible to have one movement operating at level "F", with a heavier main street movement operating at LOS "A", and the intersection as a whole functioning comparatively well. Table IV.H-F describes the level of service criteria for unsignalized intersections.

Table IV.H-E - Signalized Intersection Level of Service Definitions

Level of Service	Vehicle Delay (seconds)	Volume to Capacity Ratio	Description
A	≤ 5.00	0.00 - 0.59	**Free Flow/Insignificant Delays:** No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
B	5.1 - 15.0	0.60 - 0.69	**Stable Operation/Minimal Delays:** An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles.
C	15.1 - 25.0	0.70 - 0.79	**Stable Operation/Acceptable Delays:** Major approach phases fully utilized. Most drivers feel somewhat restricted.
D	25.1 - 40.0	0.80 - 0.89	**Approaching Unstable/Tolerable Delays:** Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.
E	40.1 - 60.0	0.90 - 0.99	**Unstable Operation/Significant Delays:** Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
F	≥60	N/A	**Forced Flow/Excessive Delays:** Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report No. 209, Washington, D.C., 1985.

Table IV.H.F - Unsignalized Intersection Level of Service Definitions

Level Service	Expected Delay	Reserve Capacity (Vehicles/Hour)
A	Little or no delay	≥ 400
B	Short traffic delays	300 - 399
C	Average traffic delays	200 - 299
D	Long traffic delays	100 - 199
E	Very long traffic delays	0 - 99
F	Extreme delays potentially affecting other traffic movements in the intersection	≤ 0

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report No. 209, Washington, D.C., 1985.

The analysis of AM and PM peak hour intersection levels of service examines the following development scenarios. The Phase 1 development levels for Diablo Grande were evaluated only under the existing plus project condition.

- Existing Conditions
- Existing Plus Phase 1
- Existing Plus Total Project
- Cumulative Without Lakeborough Plus Total Project
- Cumulative With Lakeborough Plus Total Project

For the existing plus project options, the existing street system was used. All traffic from Diablo Grande was assumed to use either the new Access Road or Oak Flat Road. No provision for secondary access to the site was assumed. Table IV.H-G summarizes the peak hour intersection levels of service for existing plus project conditions. Figure IV.H-5 provides as graphic representation of intersection improvements which would be required to improve intersection operations to acceptable levels of service.

For the cumulative conditions, the proposed interchange recommended in the Lakeborough EIR at Ward Avenue/I-5 was assumed. Further, the recommended turning lanes suggested in the Lakeborough EIR were also used. Table IV.H-H summarizes the peak hour intersection levels of service for cumulative plus project conditions. Figure IV.H-6 provides as graphic representation of intersection improvements which would be required to improve intersection operations to acceptable levels of service under cumulative without Lakeborough conditions. Figure IV.H-7 provides as graphic representation of intersection improvements which would be required to improve intersection operations to acceptable levels of service under cumulative without Lakeborough conditions.

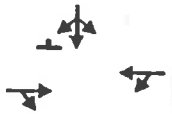
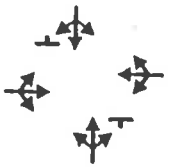
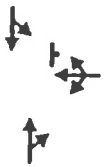
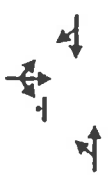
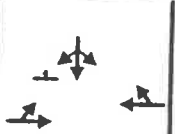
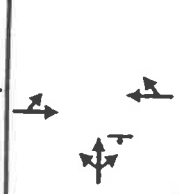
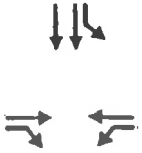
Existing Plus Phase 1. Addition of Phase 1 project traffic to existing traffic would result in one intersection operating at unacceptable levels of service:

- *I-5 Southbound/Sperry Road* - This intersection is currently operating at LOS A during both the AM and PM peak hours. Addition of Phase 1 traffic would result in the degradation to LOS D during the PM peak hour. Improvement of this intersection to acceptable levels of service would require signalization.

Existing Plus Total Project. Addition of traffic generated by the entire Diablo Grande project traffic to the existing street system would result in two intersections operating at unacceptable levels of service:

Table IV.H-G - Existing Plus Project Peak Hour Intersection Levels of Service

Development Scenario Peak Hour	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward	Ward Ave. Marshall	Ward Ave. Oak Flat	I-5 SB at Fink Road	I-5 NB at Fink Road
Existing Street System Existing 1991 Traffic Levels							
AM Peak - No Project	A	A	A	A	A	A	A
AM Peak - Phase 1 Project	A	B	A	A	A	A	A
PM Peak - No Project	A	A	A	A	A	A	A
PM Peak - Phase 1 Project	D	B	A	A	A	A	A
AM Peak - Total Project	A	D	A	A	A	A	A
PM Peak - Total Project	F	D	A	A	A	A	A

Development Scenario	I-5 SB at Sperry Road	I-5 NB at Sperry Road	Sperry Road at Ward Avenue	Ward Avenue at Marshall Road	Ward Avenue at Oak Flat Road	I-5 SB at Fink Road	I-5 NB at Fink Road
Existing Condition							
Existing Plus Phase 1 Project	Signal B (0.67)	No Change	No Change	No Change	No Change	No Change	No Change
Existing Plus Total Project	Signal  C (0.76)	Signal A (0.54)	No Change	No Change	No Change	No Change	No Change

Source: Dowling Associates, 1991.

12-05-91(STC102)

Figure IV.H-5

LSA

Intersection Mitigation Analysis - Existing Plus Project

Table IV.H-H - Cumulative Plus Project Peak Hour Intersection Levels of Service

Development Scenario Peak Hour	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward	Ward Ave. Marshall	Ward Ave. Oak Flat	I-5 SB at[1] Ward Avenue	I-5 NB at[1] Ward Avenue
Proposed Lakeborough Street System Cumulative Development Without Lakeborough Project							
AM Peak - No Project	F	F	F	C	C	A	A
AM Peak - With Total Project	F	F	F	D	C	A	A
PM Peak - No Project	F	F	F	D	C	A	A
PM Peak - With Total Project	F	F	F	D	E	A	E
Proposed Lakeborough Street System Cumulative Development With Lakeborough Project							
AM Peak - No Project	F	F	F	D	D	B	C
AM Peak - With Total Project	F	F	F	E	D	B	C
PM Peak - No Project	F	F	F	D	D	C	C
PM Peak - With Total Project	F	F	F	E	F	C	F

[1] The Lakeborough EIR proposed a new interchange on I-5 to replace the existing interchange at Fink Road.

Development Scenario	I-5 SB at Sperry Road	I-5 NB at Sperry Road	Sperry Road at Ward Avenue	Ward Avenue at Marshall Road	Ward Avenue at Oak Flat Road	I-5 SB at Fink Road	I-5 NB at Fink Road
Existing Plus Cumulative Without Lakeborough No Project	Signal C (0.74)	Signal C (0.70)	Signal C (0.75)	Signal B (0.68)	C	A	B
Existing Plus Cumulative Without Lakeborough With Project	Signal C (0.78)	No Change C (0.77)	Signal C (0.75)	Signal B (0.60)	Signal A (0.59)	Signal A (0.57)	Signal C (0.70)

Source: Dowling Associates, 1991.

12-05-91(STC102)

Figure IV.H-6

LSA

Intersection Mitigation Analysis - Cumulative without Lakeborough Plus Project

Development Scenario	I-5 SB at Sperry Road	I-5 NB at Sperry Road	Sperry Road at Ward Avenue	Ward Avenue at Marshall Road	Ward Avenue at Oak Flat Road	I-5 SB at Fink Road	I-5 NB at Fink Road
Existing Plus Cumulative With Lakeborough No Project	Signal B (0.65)	Signal C (0.70)	Signal C (0.75)	Signal B (0.66)	Signal B (0.66)	Signal C (0.76)	Signal C (0.76)
Existing Plus Cumulative With Lakeborough With Project	Signal C (0.78)	Signal C (0.78)	No Change C (0.79)	Signal No Change C (0.68)	Signal B (0.75)	Signal B (0.60)	Signal C (0.79)

Source: Dowling Associates, 1991.

12-05-91(STC102)

Figure IV.H-7

LSA

Intersection Mitigation Analysis - Cumulative with Lakeborough Plu `roject

- *I-5 Southbound/Sperry Road* - This intersection is currently operating at LOS A during both the AM and PM peak hours. Addition of project traffic would result in the degradation to LOS F during the PM peak hour. Improvement of this intersection to acceptable levels of service would require signalization, as well as improvements to the northbound approach to provide a shared through-left turn lane, and a right-turn only lane.

- *I-5 Northbound/Sperry Road* - This intersection is currently operating at LOS A during both the AM and PM peak hours. The addition of project generated traffic would result in the intersection operating at LOS D during the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization.

Cumulative Without Lakeborough Plus Total Project. Under the cumulative development scenario, four intersections are expected to operate at unacceptable levels of service, assuming existing geometrics. These intersections, and the improvements which would be required to improve operations to acceptable levels of service are:

- *I-5 Southbound/Sperry Road* - Under cumulative conditions, this intersection is forecast to operate at LOS F during both the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization, as well as improvements to the southbound and westbound approaches to provide additional capacity.

- *I-5 Northbound/Sperry Road* - Under cumulative conditions, this intersection is forecast to operate at LOS F during both the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization, as well as improvements to the eastbound and westbound approaches to provide additional capacity.

- *Sperry Road/Ward Avenue* - Under cumulative conditions, this intersection is forecast to operate at LOS F during both the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization, as well as significant improvements to all intersection approaches to provide additional capacity. With the addition of project generated traffic, additional improvement to the northbound approach would be required to provide an additional through lane.

- *Ward Avenue/Marshall Road* - Under cumulative conditions, this intersection is forecast to operate at LOS C during the AM peak hour and LOS D during the PM peak hour. Improvement of this intersection to acceptable levels of service would require signalization.

Addition of traffic generated by the Diablo Grande project to cumulative conditions will result in six intersections operating at unacceptable levels of service:

- *I-5 Southbound/Sperry Road* - Addition of project traffic to mitigated cumulative conditions would result in unacceptable levels of service. Improvement to acceptable levels of service would require additional improvement of the eastbound approach to provide an additional through lane, and improvement to the westbound approach to provide a separate through lane and a separate left turn lane.

- *Sperry Road/Ward Avenue* - Addition of project traffic to mitigated cumulative conditions would result in unacceptable levels of service. Improvement to acceptable levels of service would require additional improvement to the northbound approach to provide an additional through lane.

- *Ward Avenue/Marshall Road* - Addition of project traffic to mitigated cumulative conditions would result in unacceptable levels of service. Improvement to acceptable levels of service would require additional improvement to the northbound approach to provide an additional through lane and improvement to the northbound approach to provide an additional through lane, and improvement to the southbound approach to provide a separate through lane and a separate left turn lane.

- *Ward Avenue/Oak Flat Road* - Addition of project traffic would result in the degradation of PM peak hour operations to LOS E. Improvement to acceptable levels of service would require signalization and improvement to the northbound approach to provide two through lanes and a left turn lane, improvement to the southbound approach to provide an additional through lane, and improvement to the eastbound approach to provide separate left and right turn lanes.

- *I-5 Southbound/Ward Avenue* - Addition of project generated traffic will result in unacceptable levels of service. Improvement to acceptable levels of service would require signalization.

- *I-5 Northbound/Ward Avenue* - Addition of project generated traffic will result in PM peak hour operations degrading to LOS E. Improvement to acceptable levels of service would require signalization.

Cumulative With Lakeborough Plus Total Project. Under the cumulative development scenario, five intersections are expected to operate at unacceptable levels of service, assuming existing geometrics. These intersections, and the improvements which would be required to improve operations to acceptable levels of service are:

- *I-5 Southbound/Sperry Road* - Under cumulative conditions, this intersection is forecast to operate at LOS F during both the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization, as well as improvements to the southbound and westbound approaches to provide additional capacity.

- *I-5 Northbound/Sperry Road* - Under cumulative conditions, this intersection is forecast to operate at LOS F during both the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization, as well as improvements to the eastbound and westbound approaches to provide additional capacity.

- *Sperry Road/Ward Avenue* - Under cumulative conditions, this intersection is forecast to operate at LOS F during both the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization, as well as significant improvements to all intersection approaches to provide additional capacity.

- *Ward Avenue/Marshall Road* - Under cumulative conditions, this intersection is forecast to operate at LOS D during both the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization, as well as improvements to the southbound approach to provide additional capacity.

- *Ward Avenue/Oak Flat Road* - Under cumulative conditions, this intersection is forecast to operate at LOS D during both the AM and PM peak hours. Improvement of this intersection to acceptable levels of service would require signalization, as well as improvements to the northbound approach to provide additional capacity.

Addition of traffic generated by the Diablo Grande project to cumulative conditions will result in four intersections operating at unacceptable levels of service:

- *I-5 Southbound/Sperry Road* - Addition of project traffic to mitigated cumulative conditions would result in unacceptable levels of service. Improvement to acceptable levels of service would require additional improvement of the eastbound approach to provide an additional through lane.

- *I-5 Northbound/Sperry Road* - Addition of project traffic to mitigated cumulative conditions would result in unacceptable levels of service. Improvement to acceptable levels of service would require additional improvement to the eastbound approach to provide a second left turn lane.

- *I-5 Southbound/Ward Avenue* - Addition of project generated traffic will result in unacceptable levels of service. Improvement to accept-

able levels of service would require improvement to the southbound approach to provide a shared through-left turn lane and a free right turn lane.

- *I-5 Northbound/Ward Avenue* - Addition of project generated traffic will result in PM peak hour operations degrading to LOS E. Improvement to acceptable levels of service would require improvement to the eastbound approach to provide an additional through lane and improvement to the westbound approach to provide an additional through lane.

Project Access Roadways Capacity Analysis

The project includes three access routes. These are: 1) Oak Flat Road to both Ward Avenue and the I-5/Sperry Road interchange, 2) access through the Lakeborough development along Crow Creek, and 3) Orestimba Road to I-5. The allocation of peak hour and daily traffic to each of these access routes was based upon professional judgement and the location of the land uses on the site.

As the Diablo Grande project develops, traffic flows will vary substantially between access routes. To address the impacts of the project on each access route, the peak hour capacity of the access routes were determined. The projected levels of traffic for the project was then evaluated relative to these capacities to determine impacts.

The *Highway Capacity Manual* was used to establish the allowable roadway volumes for each facility. For two lane rural roadways, a peak hour service volume (at LOS C) of 700 vehicles per hour (two-way) is used. For four-lane rural roadways, a peak hour service volume (at LOS C) of 2,050 vehicles per hour per direction is used. A detailed summary of the development of these service volumes is contained in Appendix C, Table 12.

The traffic generated by the Phase 1 and total project development conditions was assigned to the appropriate access roadway. The resulting AM and PM hour directional and total traffic volumes were compared to the capacities noted above. Table IV.H-I summarizes the results of the analysis. The Phase 1 and total project traffic volumes are shown together with the two-lane and four-lane capacity values. The table indicates when the level of service is "C" or worse. For those conditions, the higher roadway standard would be required to maintain acceptable levels of service.

The analysis of Phase 1 development, which would only be served by Oak Flat Road, indicates that approximately 75 percent of Phase 1 (equates to approximately 700 peak-hour trips) can be constructed before Oak Flat Road would need to be widened to four lanes.

Table IV.H-I - Access Roadway Impacts

Development Condition	AM PEAK HOUR In	Out	Total	PM PEAK HOUR In	Out	Total
Phase 1 Development Oak Flat Road						
Hourly Volume	210	405	615	532	409	941
Two Lane Capacity LOS "C" or worse			700 No			700 Yes
Four Lane Capacity LOS "C" or worse	2,050 No	2,050 No		2,050 No	2,050 No	
Total Project Oak Flat Road						
Hourly Volume	350	561	911	750	626	1,376
Two Lane Capacity LOS "C" or worse			700 Yes			700 Yes
Four Lane Capacity LOS "C" or worse	2,050 No	2,050 No		2,050 No	2,050 No	
Crow Creek Access						
Hourly Volume	143	240	383	348	257	605
Two Lane Capacity LOS "C" or worse			700 No			700 No
Orestimba Access						
Hourly Volume	94	187	281	245	175	420
Two Lane Capacity LOS "C" or worse			700 No			700 No

The analysis of total project development indicates that, as indicated under Phase 1 impacts, about 75 percent of Phase 1 can be constructed before Oak Flat Road must be widened to four lanes. The access routes through Lakeborough along Crow Creek and to I-5 via Orestimba Road can be maintained at two-lanes throughout the total development of the site.

Mitigation Measures

Overall Site

Consistent with the results of the traffic impact analysis, mitigation measures for overall site development are presented for three scenarios: 1) existing plus project, 2) cumulative without Lakeborough plus project, and 3) cumulative with Lakeborough plus project.

Existing Plus Project

- Crows Landing Road from Highway 33 to north of Grayson Road should be widened to four lanes.
- Highway 33 between Crows Landing Road and Stuhr Road should be widened to four lanes.
- Carpenter Road north of Grayson Road should be widened to four lanes.
- The I-5 Southbound/Sperry Road intersection should be signalized, as well as improved to provide a southbound shared through-left turn lane and a southbound right turn lane.
- The I-5 Northbound/Sperry Road intersection should be signalized.
- The project access road between Del Puerto Canyon Road and Oak Flat Road should be constructed as a four lane roadway.
- Oak Flat Road should be widened to four lanes.

Cumulative Without Lakeborough Plus Project

The following measures would be required to mitigate the incremental impact associated with development of the Diablo Grande project. These measures are in addition to any other improvements which would be required to ameliorate cumulative development impacts.

- I-5 should be widened to six lanes.

- Ward Avenue south of Oak Flat Road should be widened to four lanes.
- Fink Road east of Ward Avenue should be widened to four lanes.
- Carpenter Road between West Main Street and Crows Landing Road should be widened to four lanes.
- The I-5 Southbound/Sperry Road intersection should be improved to provide an additional eastbound through lane, a separate westbound left turn lane, and a separate westbound through lane.
- The Sperry Road/Ward Avenue intersection should be improved to provide an additional northbound through lane.
- The Ward Avenue/Marshall Road intersection should be improved to provide an additional northbound through lane, an additional northbound through lane, a separate southbound left turn lane, and a separate southbound through lane.
- The Ward Avenue/Oak Flat Road intersection should be signalized and improved to provide improved to provide two northbound through lanes, a northbound left turn lane, an additional southbound through lane, and separate eastbound left and right turn lanes.
- The I-5 Southbound/Ward Avenue intersection should be signalized.
- The I-5 Northbound/Ward Avenue intersection should be signalized.
- The project access road between Del Puerto Canyon Road and Oak Flat Road should be constructed as a four lane roadway.
- Oak Flat Road should be widened to four lanes.

Cumulative With Lakeborough Plus Project

The following measures would be required to mitigate the incremental impact associated with development of the Diablo Grande project. These measures are in addition to any other improvements which would be required to ameliorate cumulative development impacts.

- The I-5 Southbound/Sperry Road intersection should be improved to provide an addition eastbound through lane.
- The I-5 Northbound/Sperry Road intersection should be improved to provide a second eastbound left turn lane.

- The I-5 Southbound/Ward Avenue intersection should be improved to provide a southbound shared through-left turn lane and a southbound free right turn lane.

- The I-5 Northbound/Ward Avenue intersection should be improved to provide an addition eastbound through lane and an additional westbound through lane.

- The project access road between Del Puerto Canyon Road and Oak Flat Road should be constructed as a four lane roadway.

- Oak Flat Road should be widened to four lanes.

Patterson Southern Bypass Expressway

The Patterson General Plan recommends the construction of a new southern bypass expressway. The General Plan did not provide peak hour traffic projections for the new facility. Further, the exact location of the road is subject to further study. For the Diablo Grande traffic assessment, all of the cumulative traffic generated at I-5 and Sperry Road was assumed to use the Sperry Road/Ward Avenue intersection. If the bypass is constructed, some of the Diablo Grande traffic which has been assigned to this intersection would be diverted to the expressway. This would reduce the project impacts at Sperry Road and Ward Avenue and therefore produce different turning volumes and resulting turn lane requirements.

On-Site Mitigation Measures

The following on-site mitigation measures are recommended. While not based upon technical findings, they represent reasonable requirements based upon professional judgement, experience and standard engineering practice.

- Oak Flat Road within the site can be four-lanes as shown on the Specific Plan; however, the following traffic control measures should be used:

  - Stop sign controls at all major intersections should be provided on all approaches.

  - Driveway access and egress should be restricted for a distance of at least 100 feet from the curb return tangents at all intersections.

  - All major intersections at the Town Center and Shopping areas should provide for adequate exit storage lane capacity. (Parking lot circulation should be designed to restrict access

from parking lot traffic lanes to the exiting street segments to provide any required vehicle storage.)

- Emergency vehicle access should be provided.

- Access to the project is required along Oak Flat Road with a four-lane road, through the Lakeborough project via a two-lane arterial, and to Stuhr Road via Orestimba Road via a two-lane arterial.

- All major collector streets should provide capacity for center two-way left turn lanes and left turn storage lanes at intersection approaches.

- Residential and recreational parking demand should be met off-street with no parking provided along major collector roadways. Parking along minor collectors fronting on residential property can be allowed.

- Consideration should be given to restricting direct driveway access to all major arterial, major collector and minor collector roadways. Back-lot treatments if feasible should be encouraged.

Phase 1

- The I-5 Southbound/Sperry Road intersection should be signalized.

- Oak Flat Road should be widened to four lanes prior to 75 percent of Phase 1 development (700 peak hour trips), as determined to be warranted by traffic studies.

I. AIR QUALITY

Setting

Meteorological Influences on Air Quality

An area's meteorology is often an important mediator of air pollutant impact severity. Atmospheric stability, wind speed, wind direction, and the influence of local terrain on these parameters control the speed with which pollutants disperse as one moves away from a pollutant release point to a receptor. Episodes of high atmospheric stability (also known as temperature inversions) severely limit the ability of the atmosphere to disperse pollutants vertically, while low wind speeds and confining terrain have a similar effect on horizontal dispersion.

Throughout the year, the strength (or weakness) of the Pacific High, a semi-permanent high pressure cell centered over the eastern Pacific, is a dominant influence on the climate of northern California. During the late spring, summer, and early fall, descending warm air from the Pacific High forms a stable temperature inversion over a cool coastal layer of air, inhibiting vertical mixing of the latter air mass. Even so, there is usually vigorous horizontal mixing in the surface layer because of the air flow produced by the Pacific High; strong northwest winds and relatively good air quality predominate at this time.

In the early fall and late spring, however, the surface winds weaken. As a consequence, the capacity for the horizontal dispersion of pollutants is limited. Since this slow-moving surface air mass is held in place vertically by the Pacific High, air pollutants which build up then are not readily dispersed. Lack of cloud cover and relatively high surface temperatures (both frequent occurrences in portions of the State east of the coastal mountain ranges) can promote photochemical pollutant formation if precursors, such as reactive organic compounds (ROG) and oxides of nitrogen (NO_x) are present.

Even though the overall inversion associated with the Pacific High weakens considerably in the winter, local inversions (caused by cooling of air close to the ground) can form in some areas (particularly sheltered valleys) during the evening and early morning hours. The combined effects of these inversions and the light winds typically experienced then creates a high potential for air pollutant buildup.

Regulatory Context

Criteria Pollutants

Pursuant to the federal Clean Air Act (CAA) of 1970 and subsequent revisions, the EPA established national ambient air quality standards (NAAQS) and set emission limits for many sources of air pollutants. The NAAQS were to be

achieved through a scheduled extension of emission controls to all pollutant sources which came under the CAA's mandates. While major stationary sources receive individual scrutiny from local regulatory agencies and operate under conditions specified in permits issued by those agencies, mobile sources (e.g., motor vehicles, by far the largest sub-category) are regulated much more generically, usually at the federal and state level only.

NAAQS were established for several major pollutants. These pollutants are termed "criteria" pollutants because the EPA's choice of NAAQS is supported by specific published evidence. The NAAQS are two-tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation and property, etc.). The NAAQS are shown in Table IV.I-A. The six criteria pollutants which have attracted the greatest regulatory concern nationwide are: ozone, carbon monoxide (CO), suspended particulate matter (TSP), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead; the specific health effects which result from undue exposure to them are shown in Table IV.I-B. (Note: With regard to TSP, it must be said that the original ambient standards did not directly address the class of particles most able to harm human health. Subsequently revised standards, discussed below, focus on particles less than 10 microns in diameter, abbreviated PM_{10}, which can penetrate deep into human breathing passages.)

Historically, criteria pollutant control efforts have received the highest priority. A five-year deadline for NAAQS attainment was set by the 1970 CAA, but the attainment date was subsequently revised by the 1977 CAA Amendments. The 1977 CAA Amendments required each state to identify areas within its borders that did not meet the NAAQS and to develop an EPA-approved State Implementation Plan (SIP), which would demonstrate state attainment of all NAAQS by 1982. Subsequently, the attainment deadline was extended to 1987.

Several government agencies have been established to improve California's air quality. The Air Resources Board (ARB) has ultimate jurisdiction over all air pollution control programs in the State. The ARB sets State ambient air quality standards (CAAQS, also shown in Table IV.I-A), monitors air quality throughout the State, limits allowable emissions from motor vehicles, and serves as the official liaison with the EPA on air quality issues. The ARB has divided the State into many single and multi-county air basins. Significant local authority for air quality control within each air basin has been given to Air Pollution Control Districts (APCDs).

The ARB has designated the eight counties which make up the San Joaquin Valley (i.e., San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern) as an air basin under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). Within the San Joaquin Valley the SJVUAPCD regulates stationary source emissions and formulates local air quality improvement plans.

Table IV.H-C - Daily Roadway Capacities by Level of Service

Roadway Type	Peak Hour Level of Service "C"	"D"	"E"
City Streets			
Two-lane	12,000	13,000	15,000
Four-lane	24,000	27,000	30,000
Six-lane	36,000	40,000	45,000
Expressways			
Two-lane	16,000	18,000	20,000
Four-lane	32,000	36,000	40,000
Six-lane	48,000	54,000	60,000
Freeways			
Two-lane	34,000	38,000	40,000
Four-lane	68,000	76,000	80,000
Six-lane	102,000	114,000	120,000
Rural Highways[1]			
Two-lane	7,000	11,500	---

[1]This standard was applied, at the request of Stanislaus County, to Ward Avenue, Fink Road, Crows Landing Road, Carpenter Road, Stuhr Road, and Highway 33.

Table IV.H-D - Forecast Daily Traffic Volumes

Development Scenarios	Average Daily Traffic	Required Number of Travel Lanes
I-5 North of Sperry Road		
Existing	21,200	2
Existing Plus Project	29,450	2
Cumulative No Lakeborough No Project	60,500	4
Cumulative No Lakeborough With Project	68,750	6
Cumulative With Lakeborough No Project	68,600	6
Cumulative With Lakeborough With Project	76,850	6
I-5 North of Stuhr Road		
Existing	21,200	2
Existing Plus Project	26,200	2
Cumulative No Lakeborough No Project	65,500	4
Cumulative No Lakeborough With Project	70,500	6
Cumulative With Lakeborough No Project	70,600	6
Cumulative With Lakeborough With Project	75,600	6
Sperry Road East of I-5		
Existing	2800	2
Existing Plus Project	6,040	2
Cumulative No Lakeborough No Project	31,000	6
Cumulative No Lakeborough With Project	34,260	6
Cumulative With Lakeborough No Project	31,000	6
Cumulative With Lakeborough With Project	34,260	6
Las Plamas Road East of Highway 33		
Existing	7,550	2
Existing Plus Project	9,750	2
Cumulative No Lakeborough No Project	24,000	4
Cumulative No Lakeborough With Project	26,200	4
Cumulative With Lakeborough No Project	24,000	4
Cumulative With Lakeborough With Project	26,200	4
Ward Avenue South of Sperry Road		
Existing	650	2
Existing Plus Project	1,810	2
Cumulative No Lakeborough No Project	2,700	2
Cumulative No Lakeborough With Project	3,860	2
Cumulative With Lakeborough No Project	8,800	4
Cumulative With Lakeborough With Project	9,960	4

The ARB and the APCDs operate numerous air quality monitoring stations throughout the State. Data collected at these stations are used to classify air basins and portions thereof, as "attainment" (if the primary NAAQS have been achieved) or "non-attainment" (if the primary NAAQS have not been achieved) for each criteria air pollutant. The APCDs are responsible for preparing local attainment plans for their county/air basin if NAAQS are being violated; the ARB incorporates these local attainment plans into the SIP.

The California Clean Air Act (CCAA), which became effective on January 1, 1989, provides a planning framework for attainment of California Ambient Air Quality Standards (CAAQS). Local APCDs and AQMDs in violation of state ambient air quality standards were required to prepare plans for attaining the CAAQS. The CCAA provided for the classification of air basins into three classes depending upon the findings of the attainment plans: moderate if CAAQS attainment could not be demonstrated before December 31, 1994; serious if CAAQS attainment could not be demonstrated before December 31, 1997; and severe, if CAAQS attainment could not be demonstrated at all. For each class, the CCAA specifies attainment strategies that must be adopted. For all classes, attainment plans are required to demonstrate a five percent per year reduction in the emissions of non-attainment pollutants or their precursors, unless the ARB determines that all feasible measures are being employed.

In response to the 1988 California Clean Air Act and the 1990 Clean Air Act Amendments, the SJVUAPCD has recently adopted the Air Quality Attainment Plan (AQAP). The strategy to be pursued to reduce air pollutant emissions include: 1) new motor vehicle emission standards adopted by the State; 2) enhanced motor vehicle inspection and maintenance programs; 3) tighter controls on new and existing industrial sources; and 4) Transportation Control Measures (TCM) to reduce vehicle trips, vehicle miles traveled, and traffic congestion.

Toxic Air Contaminants

In addition to the major criteria air pollutants, many other substances are known or suspected to be highly injurious to human health. Their adverse health effects can manifest themselves either as acute, debilitating symptoms after a short-term heavy dose or by the development of various cancers after long-term low-level exposure. The EPA has established a list of over 400 "extremely hazardous" substances and has promulgated emission standards (known as National Emissions Standards for Hazardous Air Pollutants or NESHAPS) for nine of these compounds (i.e., arsenic, asbestos, benzene, beryllium, cadmium, coke oven emissions, mercury, radionuclides, and vinyl chloride). California had designated several substances as "toxic air contaminants" (termed TACs; the list includes asbestos, benzene, cadmium, chromium, dioxin, ethylene dichloride, and ethylene dibromide) and is reviewing many others under the process established by AB 1807 (Tanner).

Although no federal or State ambient air quality standards have been set for toxic air pollutants, a recently passed State law has relevance here. The purpose of AB 2588, the Air Toxics "Hot Spot" Information and Assessment Act of 1987, is to require the gathering of information on airborne compounds that may pose an acute or chronic threat to public health. The Act specifies that each local APCD/AQMD determine which facilities must prepare a health risk assessment. This assessment must include a comprehensive analysis of the dispersion of hazardous substances in the environment, the potential for human exposure, and a quantitative assessment of both individual and population-wide health risks associated with those levels of exposure.

Air Quality Problems in the San Joaquin Valley

The San Joaquin Valley is the largest air basin in California and its air pollution potential is one of the highest in the United States. Topographic and meteorological conditions there often reduce the ability of the atmosphere to disperse air pollutants and allow such pollutants to attain relatively high ambient concentrations.

Prior to the advent of this century, air in the San Joaquin Valley was relatively clean. Particulates entrained by wind blowing across the Valley floor, combustion products injected by fires caused by natural and human activity, and hydrocarbons emitted from vegetation were the only air pollutants. Present air quality problems come as a result of extensive industrial, agricultural, and urban development, especially from the widespread and growing use of motor vehicles by Valley residents.

The ARB and the SJVUAPCD operate a number of ambient air quality monitoring stations throughout the Valley which measure the ambient pollutant concentrations. The data show a general trend of worsening air quality as one moves from north to south in the Valley. On the basis of monitoring, all of the San Joaquin Valley is currently designated a non-attainment area for the ozone and CO NAAQS and for the ozone, CO, and PM10 CAAQS. Table IV.I-C summarizes the highest measured pollutant concentrations for ozone, CO, and particulates at monitoring stations in Stanislaus County and shows how they compare with standards.

The causes of the violation of the NAAQS and CAAQS for ozone in the San Joaquin Valley area are complex. Unlike many air pollutants, ozone is not emitted directly into the atmosphere, but is produced in the atmosphere by a complex series of photochemical reactions involving reactive organic compounds (ROG) and nitrogen oxides (NO_x). No single source accounts for most of the ROG and NO_x emissions and the many sources are spread throughout the basin. The San Joaquin Valley's intense heat and sunlight during the summer months are ideal for the formation of ozone. Ozone levels can vary widely at the monitoring stations, depending on location and time of year, but the highest levels are generally recorded at the more southerly of the monitoring stations. In addition to the adverse effects on human health (as

Table IV.I-C: Air Pollutant Data Summary (1988-1990)

Pollutant	Station	Standard	1988	1989	1990
OZONE:					
Highest 1-hour	Turlock	0.12/0.10	0.14	0.13	0.12
Days > 0.12 ppm			4	3	NA
Days > 0.09 ppm			55	31	17
Highest 1-hour	Crows	0.12/0.10	0.13	0.11	0.15
Days > 0.12 ppm	Landing		1	NA	1
Days > 0.09 ppm			32	2	21
CARBON MONOXIDE:					
Highest 1-hour	Modesto	35.0/20.0	17	17	17
Days > 35.0 ppm			0	0	0
Days > 20.0 ppm			0	0	0
Highest 1-hour	Crows	35.0/20.0	2	2	1
Days > 35.0 ppm	Landing		0	0	0
Days > 20.0 ppm			0	0	0
Highest 8-hour	Modesto	9.0	13.1	13.4	10.9
Days > 9.0 ppm			2	10	3
Highest 8-hour	Crows	9.0	1.1	1.3	1
Days > 9.0 ppm	Landing		0	0	0
PARTICULATES (PM10):					
Highest 24-hour	Modesto	50.0	175	146	125
Days > 50 um/m3			11	18	5
Annual Average		30.0	57	45	39
Year > 30 ug/m3			YES	YES	YES
Highest 24-hour	Crows	50.0	123	145	180
Days > 50 um/m3	Landing		17	17	19
Annual Average		30.0	39	54	35
Year > 30 ug/m3			YES	YES	YES

Abbreviations:

ppm - parts per million
ug/m3 = micrograms per cubic meter
NA - data not available.

shown in Table IV.I-B above), ozone is the pollutant primarily responsible for damage to crops and natural vegetation in California. Ozone injury to plants can occur as either acute injury (i.e., tissue death or death of the whole plant) at moderate to high concentrations (0.15 ppm and above for two to eight hours), or as chronic injury (i.e., reduced crop yield or impaired ecosystem stability) resulting from repeated exposure to ozone at low to moderate concentrations (0.04 to 0.2 ppm for a few days to several months).

In contrast to ozone, CO is a sub-regional problem in the Valley, because CO is a non-reactive pollutant with one major source, motor vehicles. Ambient CO distributions closely follow the spatial and temporal distributions of vehicular traffic, and are strongly influenced by meteorological factors such as wind speed and atmospheric stability. The one-hour and eight-hour CO standards are occasionally exceeded in those parts of the Valley subject to a combination of high traffic density and susceptibility to the occurrence of surface-based radiation inversions during the winter months (i.e., urban areas).

The major sources of particulates in the Valley are agricultural operations and burning, although demolition/construction activity and the entrainment of dust by motor vehicles can be important sources in urban areas. Ambient concentrations of particulates can reach levels which reduce visibility through much of the year.

The major sources of NO_x, compounds which have an important role in the formation of ozone, are vehicular, residential, and commercial fuel combustion. NO_2 is the most abundant form of ambient NO_x. The NO_2 standard has not been exceeded anywhere in the Valley over the last ten years.

The burning of high sulfur fuels for activities such as electricity generation petroleum refining, and industrial processes are the major sources of ambient SO_2. The highest levels of SO_2 are recorded by monitoring stations located around Bakersfield. The SO_2 standard is currently being met throughout the Valley.

To the west of the San Joaquin Valley, the Bay area has recently established a number of monitoring stations to track ambient levels of the eleven most common toxic air pollutants: Perchloroethylene (PERC), Ethylene Dibromide (EDB), Ethylene Dichloride (EDC), Trichloroethylene (TCE), Methyl Chloroform (TCA), Methylene Dichloride, Carbon Tetrachloride, Chloroform, Vinyl Chloride, Benzene, and Toluene. Many of the Bay area stations are located in or near industrial areas where sources of toxics are concentrated. Industrial areas in Stanislaus County must also be considered as potential sources of toxic air pollutants, as would agricultural areas, where pesticide use is common.

Impacts

Project air quality impacts comprise two categories: temporary impacts due to project construction and long-term impacts due to project operation.

Construction Phase Impacts

Construction activities would create a temporary increase in dustfall and, therefore, increase particulate concentrations near the project site.

Equipment and vehicles generate dust during clearing, excavation and grading. Construction vehicle traffic on unpaved surfaces also increases dust, as would wind blowing over exposed earth surfaces.

It is not possible to estimate accurately the particulate concentrations that would occur at or adjacent to the construction sites because such concentrations are very sensitive to local meteorology and topography and to variations in soil silt and moisture content. However, studies by the EPA provide a rough indication of the maximum particulate emissions expected: approximately 1.2 tons of dust are emitted per acre per month of construction activity.

Much of this dust is comprised of large particles (i.e., diameter greater than 10 microns) which settle out rapidly on nearby horizontal surfaces and are easily filtered by human breathing passages. Most of the dust generated by construction is, therefore, of concern more as a soiling nuisance rather than for its unhealthful impacts. The remaining fraction of PM_{10} might be sufficient to violate the 24-hour average PM_{10} NAAQS and CAAQS in the vicinity of construction. Any violations of the PM_{10} standard would be considered significant adverse impacts. Unless mitigation measures were implemented, elevated levels of PM_{10} would remain as long as construction continues.

Construction vehicles/equipment and worker commute vehicles would emit exhaust at the construction sites thereby contributing to the regional pollutant totals. Because vehicle/equipment emissions would be relatively small in comparison to operational emissions, they would not be significant on the regional scale, but spot violations of the CO standards may occur in the vicinity of heavy equipment use. Any violations of the CO standards could significantly impact the health of construction workers.

Operational Impacts

During and after the development of Diablo Grande, emissions from vehicles associated with project operation and from new stationary sources of air pollutants would add to County and San Joaquin Valley totals. As shown in Table IV.I-D, Phase 1 project ROG and NO_x emission increments are equal to 0.29 and 0.53 tons/day, respectively. This is 0.79 percent and 1.35 percent,

Table IV.I-D: Comparison of Project Emissions of ROG, NOx, and CO to Stanislaus County and San Joaquin Valley Totals /a/

Analysis Year	Pollutant	Source	Emissions (Lbs/Day)	Emissions (Tons/Day)	Comparison with County Baseline	Comparison with SJ Valley Baseline
2000	ROG	2200 Residential Units	577.9	0.29	0.79%	0.04%
		County Baseline /b/		37	100%	5.43%
		SJ Valley Baseline /c/		675		100%
	NOx	2200 Residential Units	1060.8	0.53	1.35%	0.10%
		County Baseline		39	100%	7.32%
		SJ Valley Baseline		535		100%
	CO	2200 Residential Units	5357.4	2.68	1.39%	N/A
		County Baseline		193	100%	N/A
		SJ Valley Baseline		N/A		N/A
2010	ROG	5000 Residential Units	1390.8	0.70	1.87%	0.10%
		County Baseline		37	100%	5.37%
		SJ Valley Baseline		693		100%
	NOx	5000 Residential Units	2893.6	1.45	3.53%	0.26%
		County Baseline		41	100%	7.27%
		SJ Valley Baseline		563		100%
	CO	5000 Residential Units	8987.3	4.49	2.43%	N/A
		County Baseline		185	100%	N/A
		SJ Valley Baseline		N/A		N/A

Footnotes:

/a/ Emissions from project-generated vehicle trips were determined using the California Air Resources Board's URBEMIS 3 model and emissions from stationary sources were generated from factors supplied by the Bay Area AQMD upon the recommendation of the San Joaquin Valley APCD.

/b/ Emission totals for Stanislaus County were taken from inventory projections released by the California Air Resources Board in December of 1990.

/c/ Emission totals for the San Joaquin Valley Air Basin were taken from inventory projections released by the California Air Resources Board in December of 1990.

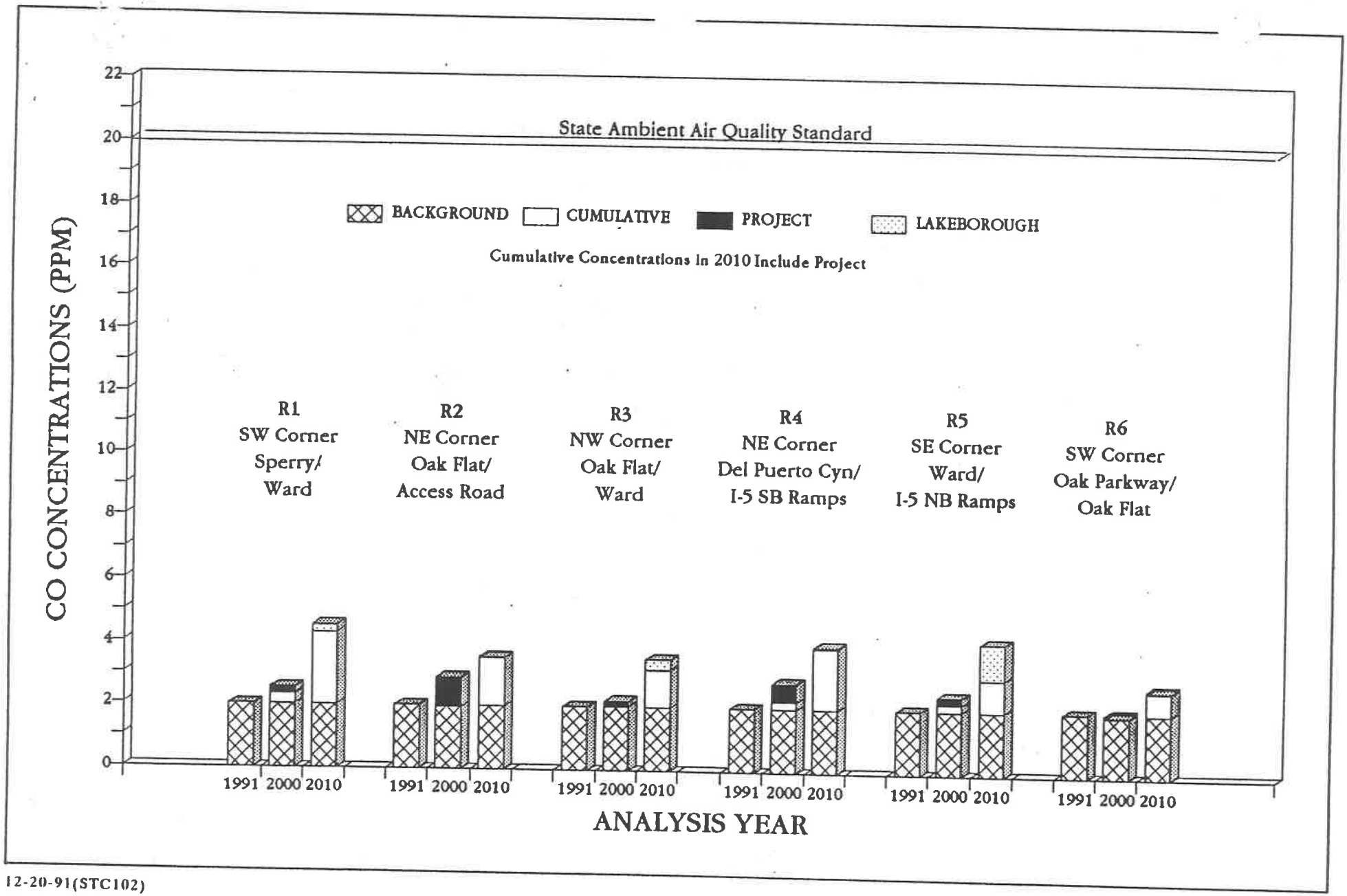


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Figure IV.I-1

LSA

Worst Case 1-Hour CO Concentrations
at Selected Sensitive Receptors

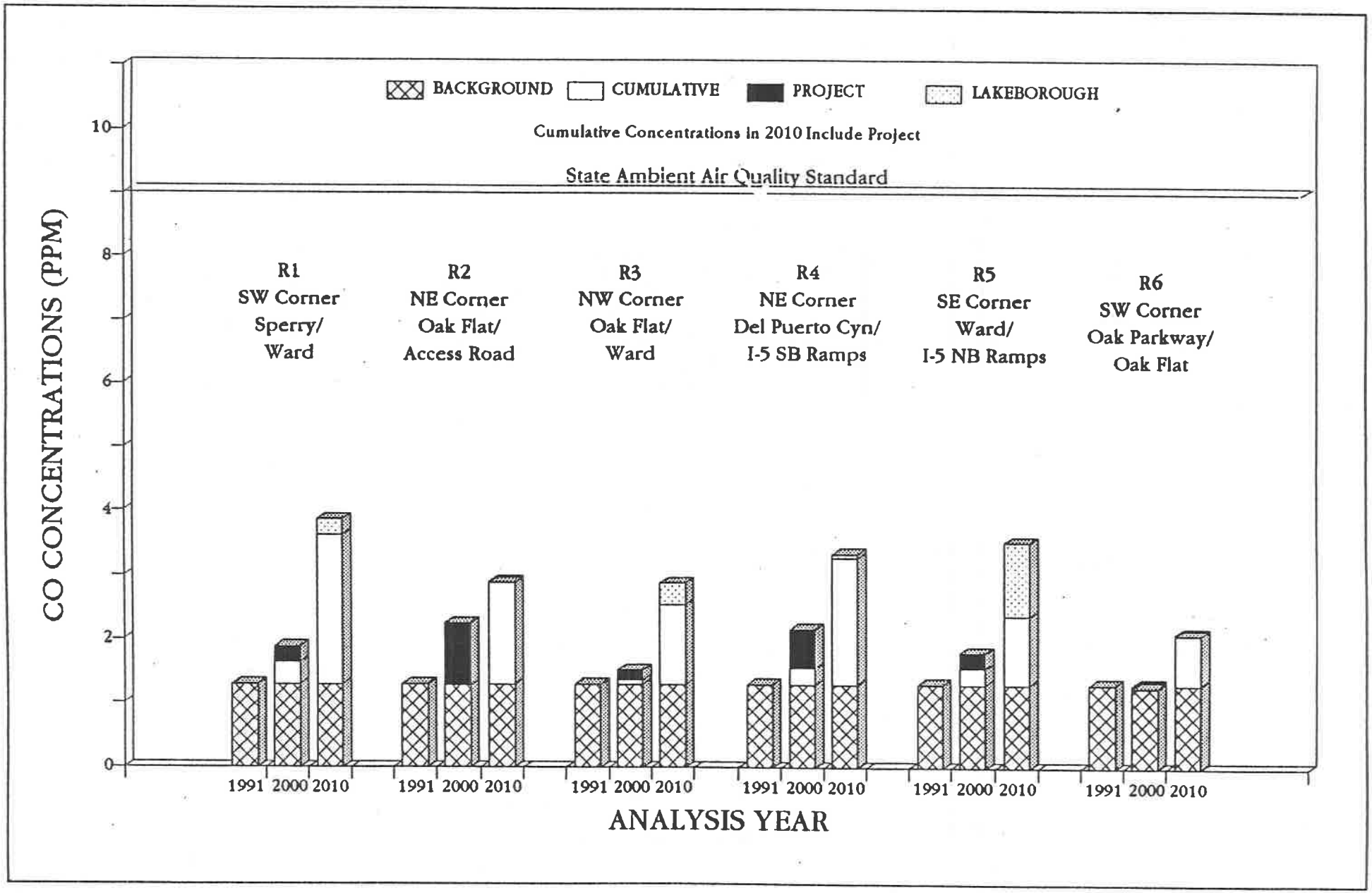

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Figure IV.I-2

LSA

Worst Case 8-Hour CO Concentrations
at Selected Sensitive R ptors

respectively, of all ROG and NO_x emission increments in Stanislaus County. Total project buildout would contribute 0.70 and 1.45 tons/day of ROG and NO_x, respectively, to the air basin. This represents 1.87 percent and 3.53 percent of all ROG and NO_x in the County. Emissions growth of this magnitude in a non-attainment area would be considered significant.

Diablo Grande traffic has the potential for affecting the local CO levels in areas adjacent to roadways which would carry project traffic. CO concentrations were estimated for existing, existing with project, and four future cumulative scenarios by using the CALINE4 model and CO background estimates obtained from monitoring data. Figures 1 and 2 show the worst-case curbside CO concentrations at six intersections where project traffic is expected to have the greatest impact.

With the assumption of a relatively low CO background for current conditions, the modeling results show no existing violations of the one-hour or eight-hour CO standards. They also show that an increase in CO concentrations near the five intersections can be expected over the next 20 years, due to project and other cumulative development traffic, but no future CO standard violations are expected either.

Potential toxic and odor emissions from the on-site Research Campus and from any remaining agricultural uses could be carried toward Diablo Grande residential areas by the local winds. Emissions of toxic air pollutants and odors, if they occur, would have significant adverse impacts on on-site residential areas.

Mitigation Measures

1. Dust emissions related to construction shall be reduced by:

   - Sufficiently watering all excavated or graded material.
   - Ceasing all clearing, grading, earth-moving, or excavation activities when wind speed exceeds 20 mph.
   - Sufficiently watering or securely covering all material transported off-site.
   - Minimizing the area disturbed by clearing, grading, earth-moving, or excavation operations.
   - Seeding and watering all inactive portions of the construction site until cover is grown.
   - Limiting vehicle speed to 15 mph in unpaved areas.

- Sweeping adjacent streets as needed to remove accumulated silt.

2. The most effective means of reducing ozone precursor emissions from motor vehicles would be to reduce the number of vehicle trips generated by Diablo Grande. A list of such Transportation Demand Management (TDM) strategies would include:

   - Develop a transportation plan that would promote the use of and offer incentives for ridesharing and transit. This plan should be developed prior to occupancy of any Phase 1 uses.

   - Apoint an on-site Transportation Coordinator to coordinate and implement employee and resident transportation programs.

   - Provide a link to existing regional mass transit systems and subsidize employee and resident purchase of transit passes.

   - Establish an on-site transit system.

   - Promote the use of low-emission (e.g., natural gas fueled) or no-emission (e.g., electric powered) vehicles on-site.

   - Promote bicycle use for on-site travel and establish bicycle routes and storage facilities.

Considering the magnitude of Diablo Grande's air pollutant emissions, even the implementation of a comprehensive set of TDM strategies would not reduce project emissions to insignificance.

3. Any on-site commercial or industrial use which may emit significant quantities of criteria or toxic pollutants shall operate under SJVUAPCD permit. SJVUAPCD and State rules governing the application and use of pesticides shall be followed.

J. NOISE

Setting

Noise: Definitions and Measurement Scales

Simply stated, noise is unwanted sound. Sound has many objective, measurable characteristics (e.g., intensity, pitch, and duration). However, the classification of a sound as "unwanted" requires a subjective judgement on the part of the listener.

Many scientific studies have confirmed that exposure to noise can disrupt sleep, shorten attention span, interfere with communication, induce symptoms of physiological and psychological stress, and, in extreme situations, damage hearing ability. In everyday life, relatively few people are exposed to noise levels high enough to be physically damaging. However, many are routinely exposed to noise levels that increase annoyance and stress.

Research has found that the sensitivity of individuals to particular types of environmental noise (e.g., aircraft fly-overs) correlates strongly with measurable, physical characteristics of the sound, such as loudness. But subjective factors relating to the situation of a listener (e.g., Is s/he working or sleeping during an especially noisy aircraft fly-over?) can have a significant role in influencing the perceived severity of the noise. Subjective factors become even more important when noise affects a large, heterogeneous community. The strength of collective adverse reaction has been found to depend on the intensity and acoustic character of the intruding noise and on the background noise present before the intruding noise began.

Useful quantitative indicators of noise level must respond to tonal character (e.g., Is the noise easily identifiable over background?) and temporal context (e.g., Does it occur at night or during the day?) as well as to loudness. The most commonly used noise indicators all express noise exposure in A-weighted decibels (dBA), a measure of sound pressure which gives preferred emphasis to frequency components most audible to the human ear. But each is responsive in a different way to the temporal context within which the noise occurs.

- L_{eq}, the equivalent energy noise level, is the average acoustic energy content of noise during the time it lasts. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure, no matter what time of the day or night they occur.

- L_{dn}, the day-night average noise level, is a 24-hour average L_{eq} with a 10 dBA "penalty" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for the greater nocturnal noise sensitivity of people.

- CNEL, the community noise equivalent level, is very similar to L_{dn}, but a 5 dBA penalty is added to noise during the evening hours, 7:00 p.m. to 10:00 p.m.

Typical noise sources and their associated noise levels are shown in Figure IV.J-1. In general, a one dBA change in noise level is the minimum difference perceptible by the human ear, a three dBA change is perceptible to most listeners, and a 10 dBA is change is perceived as a doubling of loudness.

Noise Exposure Standards

The California Department of Health Services' (DHS) Office of Noise Control has studied the correlation of noise levels and their disruptive effects. As shown, the DHS has established four categories for judging the severity of noise intrusion on specified land uses.

- Normally Acceptable - noise in this range places little undue burden on affected receptors and requires no mitigation.

- Conditionally Acceptable - noise in this range requires some mitigation of exposure, as established by an acoustic study.

- Normally Unacceptable - noise in this range is deemed so severe that extraordinary mitigation measures should be undertaken to avoid disruption to that particular land use.

- Clearly Unacceptable - noise in this range is so severe that it can not be effectively mitigated and the land use is discouraged.

The DHS recommendations for community noise environments are displayed in Figure IV.J-2. Note also that the DHS recognizes an essential equivalence between L_{dn} and CNEL as indicators of noise exposure and that the General Plan's of many counties and cities in California (including Stanislaus County) have adopted DHS guidelines with little change.

State of California Title 24 requirements limit multi-family residential unit noise exposure to 60 dBA Ldn/CNEL externally and 45 dBA Ldn/CNEL internally. They also specify minimum sound insulation standards for the partitions separating adjacent dwelling units; such partitions must reduce transmitted noise by at least 50 dBA (put another way, they must have a Sound Transmission Class or STC rating of at least 50). Note that the Title 24 requirements would also apply to single-family attached residential units.

Stanislaus County's General Plan policies place restrictions on new residential or other noise-sensitive land uses proposed for areas where the L_{dn}/CNEL exceeds 60 dBA. Such noise-sensitive uses would be permitted provided that noise abatement measures can reduce noise levels in exterior living areas to 60 dBA Ldn/CNEL and to 45 dBA Ldn/CNEL in interior living spaces. If

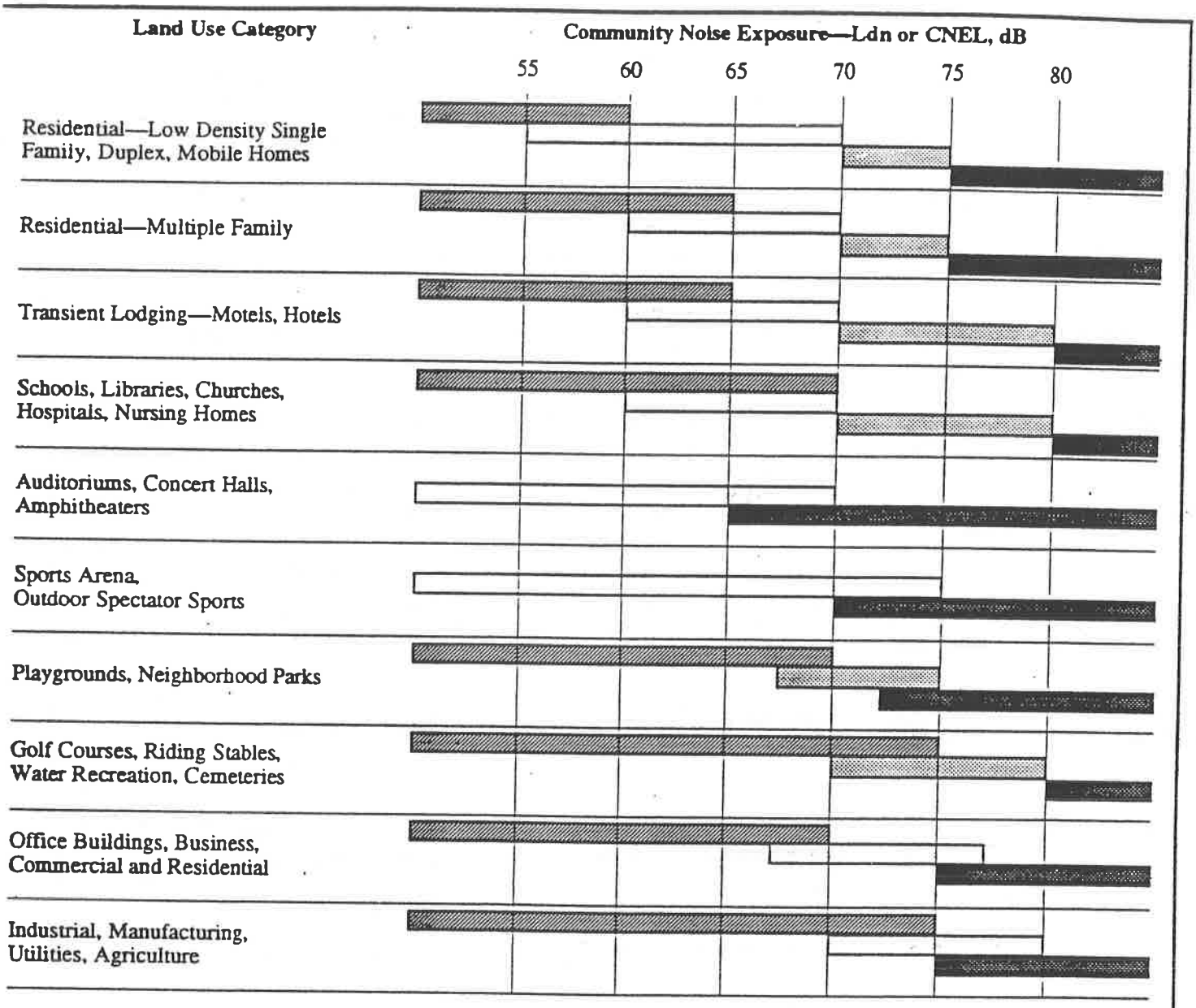
Public Reaction		Noise Level (dBA, L_{eq})	Common Indoor Noise Levels	Common Outdoor Noise Levels
			Rock Band	
		110		Jet Flyover at 1000 Feet
		100	Inside New York Subway Train	
Local Committee Activity with Influential or Legal Action	4 times as loud			Gas Lawnmower at Three Feet
Letters of Protest		90	Food Blender at Three Feet	Deisel Truck at Fifty Feet
Complaints Likely	2 times as loud		Garbage Disposal at Three Feet	Noisy Urban Daytime
		80	Shouting at Three Feet	
Complaints Possible	Reference		Vacuum Cleaner at Ten Feet	Gas Lawnmower at 100 Feet
		70	Normal Speech at Three Feet	Commercial Area
Complaints Rare	1/2 as loud			Heavy Traffic at 300 Feet
		60	Large Business Office	
	1/4 as loud		Dishwasher Next Room	Quiet Urban Daytime
Acceptance		50		
		40	Small Theatre, Large Conference Room (background), Library	Quiet Urban Nighttime Quiet Suburban Nighttime
		30	Concert Hall (background)	Quiet Rural Nighttime
		20	Broadcast and Recording Studio	
		10	Threshold of Hearing	
		0		

Source: *Caltrans Transportation Laboratory Noise Manual*, 1982; and Environmental Science Associates, Inc.

Figure IV.J-1

LSA

Effects of Noise on People



Normally Acceptable
Specified land use is satisfactory, based upon the assumption that any buildings involved are of conventional construction, without any special noise insulation requirements.

Conditionally Acceptable
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable
New construction or development should generally not be undertaken.

Note: For lands within three miles of Buchanan Field and the East Contra Costa County Airports noise compatability shall be adjusted to those of the ALUC which are roughly five CNEL lower than shown of this table.

ource: California State Office of Noise Control

Figure IV.J-2

Land Use Compatability for Community Noise Environments

exterior noise levels can not be reduced below 60 dBA by any feasible mitigation measure, noise-sensitive uses can be allowed in areas having an Ldn/-CNEL as high as 65 dBA, provided that interior levels can be kept below 45 dBA with the windows and doors closed. The development of new industrial, commercial, or other noise-generating land uses may be restricted if they cause noise levels to exceed 60 dBA Ldn/CNEL at any noise-sensitive land use.

The Crows Landing Air Installation Compatibility Use Zone (AICUZ) report promulgates 65 dBA, 70 dBA, and 75 dBA Ldn upper bounds on residential, commercial, and industrial exterior noise exposure, respectively, from flight operations at the Crows Landing Naval Auxiliary Landing Field (NALF).

Existing Noise Environment

Project Site

On-site noise measurements were taken during an afternoon site visit on February 23, 1990. Readings were taken using a GenRad 1565-B Sound Level Meter (SLM) set for slow response on the A-weighted decibel (dBA) scale. The SLM was calibrated before and after the measurements by means of a GenRad 1987 Minical Sound Level Calibrator to assure accuracy.

The project site is in a remote, rural location. The only apparent noise produced by human activity comes from the few vehicles using Oak Flat Road and occasional light aircraft overflights. Natural sounds are produced by birds, grazing animals, and the wind, but such sounds are not usually considered to be disturbing. Measurements conducted during the afternoon of February 23, 1990 indicate that ambient noise levels were below 40 dBA most of the time. Only gusts of wind and occasional animal sounds raise ambient levels into the low to mid-40's dBA. All objective evidence suggests that the existing noise environment is well within the noise exposure standards for noise-sensitive uses set by the DHS or Stanislaus County.

Project Site Vicinity

In the San Joaquin Valley east of the project site the dominant noise sources are: 1) motor vehicle traffic using I-5, Highway 33, other local arterials and collectors; and 2) and aircraft operations at the Crows Landing NALF. (Note: The 1986 noise contour map for the Crows Landing NALF, produced by Harris, Miller, Harris, and Hanson, Inc. indicates that the 60 dBA CNEL contour does not extend more than a mile from the NALF property line, while the 65 dBA CNEL contour is largely confined to NALF property).

Potential Impacts

The significance of noise impacts is established by comparing noise levels to the standards set by the Stanislaus County General Plan. For the purposes of this document, any project- or cumulative development-related increase that would result in violation of County noise standards would be considered significant. In addition, a 3 dBA noise increase would be considered significant in areas which are not already exceeding County standards. If noise levels already exceed County standards, an increase equal to or greater than one dBA would be considered significant.

Short-Term Noise Impacts Related to Project Construction

Although the site's remote rural location would prevent construction noise from adversely affecting noise-sensitive receptors in the County's nearest population centers (located several miles to the east), noise from construction during the later stages of project development could burden the residents of homes completed during earlier construction phases.

Construction activities typically require the use of a number of pieces of heavy equipment, such as bulldozers, backhoes, concrete mixers, etc. Such equipment generates noise in the 70 dBA to 90 dBA range at a 50-foot distance. Even at distances of several hundred feet from a construction site, construction noise would be audible and would distinctly contrast with the otherwise quiet rural environment of the project site.

In addition, many trucks, both heavy and light, would be required to haul away excavated material and to deliver gravel, concrete, lumber and other building materials. Noise from these truck departures and arrivals may be disruptive not only to on-site residents but also to off-site residents currently living along Oak Flat Road.

Long-Term Noise Impacts Related to Project Operation

Noise Impacts on the Project Land Uses

Traffic Noise. Construction of 2,000 to 5,000 residential units on the site (Phase 1 and overall site, respectively) together with the planned recreational and commercial development would generate substantial traffic. Since a well-traveled roadway located near noise-sensitive land uses can be a source of disruption, traffic noise intrusion would be significant if the planned residential uses were placed too close to the site's road system (i.e., in areas where Ldn/CNEL exceeds 60 dBA) or if the residences are not adequately insulated/shielded from traffic noise.

Traffic noise levels were calculated by using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108,

December 1978). Modeling can specify noise levels over any averaging time and at any distance from a roadway, provided that the model is calibrated with monitoring data and initialized with characteristic traffic volumes and vehicle mix/speed data. Table IV.J-A displays the L_{dn}/CNEL at reference setbacks of 50 feet from roadside for on-site roads. These noise level estimates are given for existing conditions, existing conditions with the project, and four future cumulative conditions with and without the project.

Project traffic would produce clearly audible noise increments (relative to the current background) over virtually all of the project site. Any of the proposed residential uses within 50 to 150 feet of a major internal roadway (i.e., Oak Flat Road, Oak Flat Parkway, or Salado Creek Circle) could be exposed to significant levels of traffic noise.

Aircraft Noise. The entire project site is well outside the 60 dBA CNEL contour established for the Crows Landing NALF. Thus, no significant aircraft noise impacts to on-site sensitive receptors are anticipated.

Noise Impacts on Off-Site Sensitive Receptors

Traffic Noise. Project traffic could produce noise impacts on the more populous portion of Stanislaus County to the east by increasing traffic flows on I-5 and other roadways. Table IV.J-A displays the L_{dn}/CNEL at reference setbacks of 50 feet from roadside for major highways and local streets to the east of the project site. These noise level estimates are given for existing conditions, existing conditions with the project, and four future cumulative conditions with and without the project.

If project traffic were added to the local roadway system under existing traffic conditions, the project-related noise increments would result in clearly audible, significant impacts to the noise environments in the vicinities of local roads closest to the site (i.e., Sperry Road, Ward Avenue, Marshall Road, and Fink Road). The project noise increments would be much less apparent under future traffic conditions, particularly if the Lakeborough development is fully built out. The significance of future project increments should not be discounted under any future conditions, however. Many residential uses bordering local roadways may experience significant cumulative noise levels in excess of the County standard. Thus, the project would contibute a dBA or two toward a further worsening of unacceptable levels of noise exposure to adjacent residences.

Table IV.J-A - Ldn/CNEL Along Selected Roadway Sections on the Project Site and in the Project Site Vicinity (in dBA at a Reference Point 50 ft. from the Roadside)

Roadway	Exist	Exist + Project	Without Lakeborough		With Lakeborough	
			+ Cum	Project + Cum	Cum	Project + Cum
ON THE PROJECT SITE						
Oak Flat Road (between Copper Mt. and Oak Flat Pkway)	--	66	--	66	--	65
Oak Flat Pkway (between Hillside Road and Oak Flat Road)	--	65	--	65	--	65
Hillside Road (near Oak Flat Pkway)	--	53	--	53	--	53
Copper Mountain Road (near Oak Flat Road)	--	57	--	57	--	57
Salado Creek Circle (near Oak Flat Pkwy)	--	62	--	62	--	62
Crow Creek Road	--	59	--	59	--	59
IN THE PROJECT VICINITY						
I-5 (North of Sperry Road)	73	74	77	77	77	77
I-5 (South of Sperry Road)	73	74	77	77	77	77
Sperry Road (East of I-5)	62	65	71	71	71	71
Las Palmas Road (East of Highway 33)	66	67	70	71	70	71
Ward Avenue (South of Sperry Road)	55	59	62	64	67	68
Ward Avenue (South of Oak Flat road)	53	64	62	66	67	69
Marshall Road (East of Ward Avenue)	50	59	60	62	60	62
Fink Road (East of Ward Avenue)	59	65	64	67	69	70
Stuhr Road (East of I-5)	57	61	62	64	67	68

Roadway	Exist	Exist + Project	Without Lakeborough + Cum	Without Lakeborough Project + Cum	With Lakeborough Cum	With Lakeborough Project + Cum
West Main (West of Carpenter)	65	66	68	68	68	68
Crows Landing Road (East of Highway 33)	65	68	68	69	70	71
Highway 33 (South of Crows Landing Road)	68	70	70	71	70	71
Highway 33 (South of Newman)	68	68	70	70	71	71
Crows Landing Road (North of Marshall Road)	65	68	69	71	71	72
Crows Landing Road (North of West Main)	66	68	68	69	69	70
Crows Landing Road (North of Grayson Road)	67	68	68	69	69	70
Carpenter Road (North of Crows Landing Road)	62	64	65	66	66	67
Carpenter Road (North of West Main)	63	65	68	68	69	69
Carpenter Road (North of Grayson Road)	65	66	68	69	69	69

Long-Term Noise Impacts Related to Regional Cumulative Development

Traffic from cumulative development in the project vicinity is expected to produce a significant adverse noise impact on noise-sensitive uses along most of local access roads which have been studied. The cumulative noise increments are quantified in Table IV.J-A and, as can be readily seen, they are, in most cases, larger than the project increment (Note: the only areas in which cumulative noise increments are not larger are near Sperry Road, Ward Avenue, Marshall Road, and Fink Road, all roadways close to site where project traffic can be expected to dominate).

Mitigation Measures

Construction Noise Impacts:

1. Construction activities should be limited to 7 AM to 7 PM on weekdays and prohibited on weekends in order to minimize disruption to nearby residential neighborhoods.

2. Procedures with the highest noise potential should be scheduled for the times when the ambient noise levels are highest (i.e., during peak commute hours).

3. The contractor should be required to employ the quietest among alternative equipment or to muffled/control noise from available equipment.

4. Noisy operations should be performed off-site or on portions of the site distant (at least 1,000 feet) from residential neighborhoods.

The severity of construction noise impacts would be reduced by these measures, but reduction to the point where no on-site residents would be disturbed is unlikely.

Operational Impacts

1. As roadway widening and enlargement projects occur from this project and other cumulative development, roadway noise levels would increase audibly over the next 20 years. The widening of roadways and other capacity improvements would, for the most part, contribute to the worsening of the noise environment by promoting larger and faster traffic flows. To alleviate noise impacts, the project applicant, together with all other new developments which would generate new traffic on the road system, should contribute a share toward mitigating noise increases on adjacent insufficiently shielded sensitive receptors. The exact impacts, mitigation, and applicable contributions would have to be determined by acoustic study on a case-by-case

basis at the time that roadway improvements are proposed, and should be determined in future environmental review of roadway improvement projects.

3
4

V. TOPICAL ISSUES AND IMPACT OVERVIEW

A. SIGNIFICANT UNAVOIDABLE IMPACTS

CEQA requires that any significant impacts, including those which can be mitigated but not reduced to a level of insignificance, be identified. The following significant effects would be unavoidable if the project were implemented.

Land Use

The project would result in significant alteration of the site's land use and adverse unavoidable impacts to the County inventory of rangeland and open space.

Geology, Soils, and Seismicity

Due to the scale of the proposed project and the nature of some of the large-acreage land use (golf courses, attached residential units), project grading could significantly alter the existing topography. The project has incorporated measures and this EIR has recommended measures to reduce the topographic impacts of grading to the extent feasible, but these impacts are still significant.

Vegetation and Wildlife

Project development along the creeks and within the lower elevations would result in direct and indirect significant unavoidable impacts to the San Joaquin kit fox through removal of dens and from road kills. In addition, the project would unavoidably impact prairie falcons and other raptors through increased human activity near nest sites.

The proposed project could result in the loss of up to 50 percent of the site's existing habitat, which could include and/or support plant and wildlife species of special concern. In addition, the project development could disrupt wildlife corridors, increase wildlife road kills, and introduce exotic plant species and domestic animals. These vegetation and wildlife potential impacts could be reduced through avoidance of oak woodland-and-riparian habitat and other areas where plant and wildlife species of special concern are located, incorporation of oak woodland riparian management plans, provision for wildlife corridors, development of a landscape plan that facilitates native species, domestic animal regulations, and incorporation of management plans to control urban pollutant impacts on vegetation and wildlife. However, they are likely to remain significant.

Public Services and Utilities

The project would require the provision of approximately 12,880 acre-feet of water per year at buildout from an off-site source for domestic, irrigation, and for light industrial uses. A firm water supply has not yet been established beyond the first five years of development, although the applicant is pursuing several sources, and a water district has been created. Until such a source is established, this is considered a significant impact. Upon establishment of such a source, off-site unmitigated impacts may occur from the transfer and use of the water.

Visual Quality

The open space visual character of the site would be transformed from open space ranchland to a mixed residential/commercial/resort character. This change would be visible from various points throughout the site. Although visual quality is a subjective determination, many observers could consider this to be a significant impact.

Air Quality

Increased traffic in the project area would have unavoidable significant impacts on air quality in the San Joaquin Valley Air Basin. Although project mitigations could reduce the traffic impact on air quality, they would not reduce them to below a level of significance.

B. SIGNIFICANT EFFECTS SUBJECT TO MITIGATION

The following potential impacts of the proposed project were found to be significant and mitigable to a level of insignificance.

Land Use

Development of the project would result in significant growth inducement to future development along Oak Flat Road. This could be offset by requiring adjacent lands to be maintained as open space/agricultural land uses.

Geology, Soils, and Seismicity

Project grading could result in potentially unstable cut-and-fill slopes and could significantly increase the potential for on-site erosion. These slope stability impacts would be offset through the preparation and incorporation of a detailed geotechnical report which would address the site-specific geologic conditions, review of grading plans and monitoring of grading

activities, provision of adequate slope stability measures and building setback, development avoidance of excessively steep areas, and the balancing of grading by phase.

Potentially significant soil impacts could result from the expansive and corrosive characteristics of the project soils. These soils impacts would be offset through incorporation of applicable engineering measures.

Although the seismic activity of the region is unpredictable, unavoidable, and represents significant hazards to people, the nature of specific project designs could intensity impacts if seismic stability concerns were not incorporated. Potential seismic damages would be reduced through construction of all project components according to current earthquake resistance design parameters, incorporation of special engineering measures within liquefiable areas, fastening fixtures, utilities and furnishings, and preparation and education of an earthquake emergency plan.

Hydrology and Water Quality

On the basis of planning estimates, new development of the project could result in the creation of about 1,100 acres of impervious surfaces. Surface runoff would increase by approximately 840 acre-feet per year. Increased runoff could significantly impact creeks through erosion and siltation. In addition, increased runoff could cause both on- and off-site flooding. Runoff impacts would be offset through the project drainage system and suggested measures recommended in this EIR which would control runoff volumes and velocity, ensure no net increase in floodwaters downstream, minimize impervious surface area, protect creek channels with erosion control measures, provide adequate floodplain setback, and drainage system maintenance.

The project could have significant adverse impacts on local water quality from grading activity, siltation, urban pollutants in runoff (especially fertilizers and pesticides from golf courses), impaired imported irrigation water quality, and potential septic tank failures in lots proposed outside the sanitary service area. These potential water quality impacts would be offset through incorporation of appropriate erosion control measures, oil and grease traps, frequent street sweeping, monitoring of water supply qualities, careful analysis of potential septic system areas, and through preparation of golf course management programs which would control the need and use of chemicals and prevent potential contamination of surrounding waters.

Cultural Resources

The project could significantly adversely affect both known and unknown cultural resources on the site. This could be mitigated by protection of rock-art areas, protection of sensitive areas, avoidance of sensitive areas where possible, overcovering sensitive areas and design of foundations to not pierce those areas, and other methods.

Public Services and Utilities

Water Supply

The first five years of project buildout would have sufficient water from local wells. Impacts on local aquifers could be mitigated by the acquisition of surface water (from the California Aqueduct) by the Western Hills Water District for use by affected well owners.

Sewage

The proposed project could generate approximately two million gallons of wastewater per day. This sewage impact would be offset by the three proposed project wastewater treatment plants. As a side benefit, the treated effluent water would be used as part of the project's demand for irrigation water.

Solid Waste

Development of the project could conceivably generate 22,000 tons of residential and commercial refuse, 16,000 tons of alum sludge from the water treatment plant, and 30,000 tons of sludge from the wastewater treatment plant. This solid waste impact would be offset through project conformance to the County SRRE plan, the siting of an alternative landfill, the project's proposed solid waste recycling program, and the investigation of potentially composting and land applying of wastewater treatment plant sludge.

Fire and Police

The project would require additional fire and police staff, equipment, and facilities to provide adequate protection. These police and fire protection impacts would be offset through the requirement of facilities and developer fees, and the project's incorporation of all West Stanislaus County Fire Department and Stanislaus County Sheriff's Department recommendations regarding project design which could help reduce the need for service.

Medical

Additional medical services could be needed from the Del Puerto Hospital District in order to provide adequate emergency medical care for the project's residences and employees. The provision of an ambulance station on site, developer fees, and/or the establishment of a special funding district would offset this impact.

Schools

The project student generation would require development of new school facilities. Developer fees and/or a special funding district would reduce the financial impacts to school facilities so that these students can be accommodated.

Recreation

The proposed project would provide a variety of park and recreational facilities opportunities which would benefit the project residences and guests. Adherence to the recommendations made by the Stanislaus County Parks and Facilities Department regarding locations, sizes, and contents of parks, recreational areas, and facilities would offset any adverse recreational impacts.

Utilities

Project development would require the extension of all major utilities. Incorporation of energy-saving measures into project design and provision of on-site substations would offset utilities impacts.

Transportation/Circulation

The addition of project-generated traffic to the area would result in unacceptable peak hour levels of service at the Sperry Road/Ward Avenue, Ward Avenue/Marshall Road, Ward Avenue/Oak Flat Road intersections as well as along Oak Flat Road. The project would also add to cumulative traffic impacts. Traffic impacts would be offset by the incorporation of recommended intersection signalization, road widening, turn lanes, and other specific improvements discussed in detail within the Traffic/Circulation section of this EIR. Diablo Grande should contribute proportionately to its impact for improvements required for cumulative development.

Noise

Construction activities through the successive phase developments would generate high noise levels in the project vicinity. Noise impacts would be offset through the limiting of construction activities to weekday daylight hours, and the use of muffled equipment.

C. *EFFECTS FOUND NOT TO BE SIGNIFICANT*

The Initial Study prepared for the project focused out the following topics as not significant:

- Potential use, extraction, or depletion of a natural resource.
- Erection of structures within a designated flood area.
- Effects on existing parking facilities.
- Impacts on existing rail, air, or public transportation system.
- Impacts on the project from surrounding agricultural practices.

D. *GROWTH-INDUCING IMPACTS*

In accordance with CEQA Guidelines Section 15126(g), the analysis of growth-inducing impacts should discuss the ways in which the proposed project could foster economic or population growth, or the construction of housing, either directly or indirectly, in the surrounding environment. In addition, any characteristics of the project that may encourage or facilitate other activities that could significantly affect the environment should be discussed.

As discussed in detail in the Land Use section of this EIR, population growth in Stanislaus County is predicted to continue at a rate of nine percent per every five years through 2010. While it has been the trend for growth to occur in the San Joaquin Valley rather than in the Diablo Range, the Valley has a shortage of developable non-prime agricultural land, which are the County's primary development locations. Development of the proposed project's 5,000-residential unit community in the Diablo Range may absorb and redirect part of the expected growth for the Valley. In this sense, the proposed project would be seen as growth-accommodating. However, due to the potential that project development may occur concurrently to rather than in lieu of growth in the Valley, and because the conversion of non-agricultural land in the Range increases the County inventory of developable land, the project could also be viewed as growth-inducing. Project residents would generate property and sales taxes and potentially stimulate growth of services/businesses in the area.

Other growth inducement may potentially result from the employment-generating land uses proposed on site, in addition to the construction job opportunities that would result from project development.

The provision of an upgraded public access to the project site would also represent growth inducements through simplifying future residential developments. Increased traffic through an area where a customer- and worker-based population exists may potentially attract future commercial and industrial developments. Development of the project site would expand and/or increase public services and utilities. The most important public utility that would be growth inducing is the provision of a domestic water source. Although the water and sewage lines and treatment plants would be sized to meet the specifications of the proposed development only, infrastructure could be extended or upgraded to service off-site development or development in areas currently proposed for open space. In addition, the introduction of water from off-site sources could be growth-inducing. The introduction of utility infrastructure into undeveloped areas would increase the ultimate

buildout capacity of the area, and, therefore, would be considered growth inducing.

E. *RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY*

The relationship between local short-term use of the environment and the maintenance and enhancement of long-term productivity often entails a balancing of social, economic and environmental impacts over time. In some cases, a relatively short-term benefit may have adverse long-term effects, with the possibility that future generations may be burdened with warranted social and environmental costs. It is also possible to have long-term benefits at the expense of short-term costs. Balancing of such impacts from this project is the responsibility of the County of Stanislaus as part of its policy-making and regulatory function.

Short-term impacts associated with the project would include impacts from construction activities, including increased traffic, noise, dust, and energy consumption. The project would encourage short-term economic growth through the provision of employment for construction workers.

Long-term effects of the project include the loss of open space and habitat to development increased traffic and noise, contribution to cumulative air quality impacts for increased traffic levels, alteration of existing topography and drainage characteristics, and increased demand for public services and utilities. Other long-term effects of the project include the preservation of 12,700 acres of Conservation Areas within the site's higher elevations, the enhancement of housing, and employment opportunities within the County, and the provisions of increased revenue to the County and all other benefitting districts.

F. *SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED*

Construction of the proposed project would irrevocably commit roughly 40 percent of the project site, currently consisting of grazing land and open space, to mixed land use development. The project would result in irreversible topographic and hydrologic alterations, loss of habitat, and changes in the visual character of the site. Consumption of non-renewable energy and materials would be required during project construction. During the life of the project irreversible environmental changes would result from increased traffic and auto emissions, increased demand for public services, water resources, sewage treatment, landfill capacity, energy, and other utilities.

G. CUMULATIVE IMPACTS

CEQA Guidelines define cumulative impacts as ".....two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts....." (Section 15355). Cumulative impacts only need be discussed when they are significant. This discussion must indicate their severity and likelihood of occurrence. The analysis need not be as in-depth as the project alone, ".....but be guided by the standards of practicality and reasonableness....." (Section 15130). The following elements are necessary to an adequate discussion of cumulative impacts:

(1) Either:

(a) A list of past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency, or

(b) A summary of projections contained in an adopted general plan or related planning document which is designed to evaluate regional or area-wide conditions. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency;

(2) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available, and

(3) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable options for mitigating or avoiding any significant cumulative effects of a proposed project.

"With some projects, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis" (Section 15130).

A significant number of mixed-use developments are proposed in Stanislaus and Merced counties. Many of these projects include General Plan amendments, changes to zoning, and Specific Plan submittals. Although these projects are proposed and/or approved, many of these projects are on hold and may not be constructed. Table V.G-A: Cumulative Projects, summarizes the major proposed projects within Stanislaus and Merced counties.

The following is a list of potential cumulative impacts that are expected to occur with cumulative development in the project vicinity:

Table V.G-A - Cumulative Projects

Project	Location	Description
Lakeborough	Stanilaus County; adjacent to Interstate 5 near the Fink Road interchange.	• 4,328 acres • 10,000 dwelling units • 1,580,000 sq. ft. commercial • 4,181,800 sq. ft. office/industrial
Grayson Park Unit Number Three	Stanislaus County: adjacent to the northerly boundary of Grayson; north of Minnie Street on River Road	• 154.27 acres • 633 single-family dwelling units • 40,500 sq. ft. neighborhood commercial • 13.93 acre park
Mapes Ranch	Stanislaus County; on State Route 132 at the confluence of the San Joaquin, Tuolumne and Stanislaus Rivers	• 3,435 acres • 12,325 dwelling units • 6,403,000 sq. ft. commercial/industrial • 245 acres community services • 6,485,000 sq. ft. university
Santa Nella Community	Merced County; Santa Nella area near Interstate 5 and Route 33	• 4,800 acres • Mixed-use developments • [specifics to be incorporated]
Villages of Laguna San Luis	Merced County; intersection of Interstate 5 and Highway 152	• 4,535 acres • 15,962 dwelling units • 2,069,105 sq. ft. commercial • 4,538,925 sq. ft. office/light industrial/research and development • 78,500 sq. ft. medical • 187,300 sq. ft. community services
Wilkinson Ranch	Merced County; south of Ingomar Grade and Grand Avenue; west of Volta Road	• 177 acres • 630 single family dwellin units • 6 acres multiple housing units • 25 acres parks • 5 acres commercial

Project	Location	Description
Fox Hills New Community	Merced County; near Interstate 5 and southern terminus of Volta Road	• 390 acres • 400 dwelling units • 18-hole golf course and associated development • neighborhood commercial • neighborhood park

Land Use

Cumulative development would result in decreases in the Stanislaus County inventory of non-prime and prime agricultural land, by converting rangeland and farmland to developed uses. Although development occurring west of I-5, in particular Diablo Grande and Lakeborough, would designate portions of the project sites to open space, the conversion of undeveloped open space to developed uses would result in a net loss of County open space. However, public access to remaining open space would likely be improved as a result of improved roads to support development populations.

Cumulative development in Stanislaus and Merced counties potentially may result in growth inducing impacts for each County. Projects in previously undeveloped areas, such as the proposed Diablo Grande and Lakeborough projects, would result in the improvement of infrastructure services and public access to the area. The existence of a service infrastructure would significantly decrease barriers to development in the region. Population immigration accompanying development would provide a customer base and worker pool which would potentially attract future commercial and industrial development. Conversely, the development outside of Stanislaus County would potentially absorb a portion of the growth expected for the County. While redirection of county immigration may potentially mitigate impacts due to County-wide growth, the cumulative development may potentially induce growth in the tri-county region of Stanislaus, San Joaquin and Merced counties.

Geology, Soils, and Seismicity

Cumulative development in the project vicinity would result in further topographical alteration, soil disturbance, compaction and overcovering, and the potential creation of unstable cut and fill slopes through grading if not properly designed, engineered, monitored and mitigated with appropriate measures. Cumulative grading activities would add to the potential erosion and stream sedimentation impacts if not offset by adequate erosion control plans. Cumulative development in the Stanislaus-Merced counties area would subject additional people to potential seismic hazards such as strong ground shaking, surface rupture, landsliding, and liquefaction and the potential structural and bodily injuries that could result from their impacts. Cumulative development would be subject to adverse building foundation, roadway, and buried utility impacts from expansive and corrosive soil.

Hydrology and Water Quality

Cumulative development would result in the further alteration of existing drainage patterns and the creation of additional impervious surface acreage. Increased surface runoff from cumulative development would increase the potential for on-site as well as downstream flood problems along the San Joaquin River as well as sedimentation impacts to water quality. Runoff from

cumulative development areas would add to the degradation of surface and possibly groundwater quality through its contact with urban pollutants such as oil, grease, fertilizers, and pesticides if runoff quality control measures and chemical use regulations were not incorporated into project plans and periodically monitored.

Vegetation and Wildlife

Cumulative development in Stanislaus and Merced counties would result in further loss of habitat for vegetation and wildlife species. Of special concern would be the loss of oak woodland, riparian areas, rock outcrops, and native bunchgrass grassland habitats and the special plant and wildlife species of concern which are known to occur in them such as the San Joaquin kit fox, which is a state threatened and federally endangered species. Cumulative development would further disrupt wildlife corridors, create road hazards for wildlife, introduce non-native plant and animal species, and result in potential impacts to vegetation and wildlife from urban pollutants.

Cultural Resources

Cumulative development would continue to increase the potential for disturbing or destroying cultural materials, especially at proposed developments along riparian corridors, where cultural resources are particularly concentrated. Grading and ground clearing in preparation for construction can destroy sensitive archaeological sites. Increased population dispersed over a greater area may also result in increased vandalism of such sites. Incorporation of a cultural resources element in required mitigation monitoring plans, as needed, would adequately address future degradation of this resource.

Public Services and Utilities

Water

Water in Stanislaus County and most of California is a limited resource and urban development could have a cumulative impact on its availability and quality. Withdrawal and transport of water from the California Aqueduct, the Delta Mendota Canal, and/or from other areas could cumulatively impact water quantity and quality at the location from which water is withdrawn. This would be a cumulative impact not only on urban and agricultural uses but also on fisheries and wildlife resources.

Sewer

Cumulative development would increase the demand for sewage collection, treatment, and disposal. Additional collection and treatment infrastructure would be required.

Solid Waste

Proposed projects would add to the cumulative increase in the generation of solid waste and the depletion of the two Stanislaus County landfills. Assuming that AB 939 diversion program goals are met, and annual waste stream growth does not exceed the County's 3.5 percent projection, a new County landfill location will need to be selected prior to the year 2009 unless the expansion area within the Fink Road Landfill is allocated within Lakeborough or unless a new landfill is sited in the project area.

Police and Fire

Proposed projects would add cumulatively to the demand for fire and police services. Cumulative development would require additional staff, equipment, and facilities. Fire fighters and police officers would be drawn more often into the unincorporated area east of I-5 and further from the existing urban areas east of I-5. The cumulative impacts of development on the California Highway Patrol (CHP) would remain potentially significant due to the uncertainty of State staffing and funding levels for the CHP.

Medical

Medical services provided by the Del Puerto Hospital and other hospital and health care services would be cumulatively impacted by the increased population from the Diablo Grande project and other proposed projects. Additional beds and staff would be needed at the hospitals.

Schools

Increased development would lead to an increase in school-age children. This could be significant at schools which are already operating beyond capacity.

Recreation

Although a variety of parks and recreation activities would be provided by proposed developments, additional residents would add cumulatively to the numbers of people using parks and recreation facilities in the vicinity.

Utilities

The project would add cumulatively to the demand for gas and electricity and associated lines and facilities.

The cumulative impacts on public services and some utilities may be offset or mitigated by requirements placed upon the applicant in the form of development fees, required infrastructure improvements, or by revenues generated by the project in the form of taxes benefitting local service-providing agencies.

The cumulative impacts on public services and some utilities may be offset or mitigated by requirements placed upon the applicant in the form of development fees, required infrastructure improvements, or by revenues generated by the project in the form of taxes benefitting local service-providing agencies.

Visual Quality

The cumulative scenario would result in substantial new development occurring in the project site region. Currently, the area can be characterized as rural, open space with some agricultural enterprises. The cumulative scenario would result in other human activities occurring in many places where now there is little to no activity except agriculture. Buildings, lights, vehicular traffic, roadways and parking lots, would tend to cumulate to substantially change the ambient visual quality of the area to a transitional rural-to-suburban character. Significant visual impacts would be unavoidable in the cumulative scenario. However, if overall development is of sufficient high quality and sensitively addresses visual quality issues with appropriate site planning and other design solutions to avoid adverse visual impacts, then the emerging transitional character would not necessarily be considered adverse.

Transportation and Circulation

Cumulative Without Lakeborough

Cumulative development in the Stanislaus-Merced counties area would require that I-5, near the project be widened from four to six lanes. While it is possible that a portion of the cumulative traffic would include traffic from Diablo Grande, the project traffic was added to the projected cumulative traffic to produce a worse case scenario.

In addition, Sperry Road and Las Palmas roads near Patterson would require two additional lanes due to the project. Again, the traffic projections for Sperry and Las Palmas roads in Patterson were taken from the City of Patterson General Plan. As the project was not included in the cumulative traffic projections, the project was added to the cumulative. It should be

noted, however, that if the project is approved some of the traffic projected in Patterson would travel to and from the site. Thus, the cumulative assessment shown in this EIR is conservative.

The remaining streets could be maintained with the number of lanes required for the cumulative conditions without project condition. The project would not produce a demand for more travel lanes.

Cumulative With Lakeborough

Along I-5, there would be a demand for six lanes with and without the project. Within Patterson, the project would create the need for two additional travel lanes. Ward Avenue south of Oak Flat Road would require two additional lanes due to the project. The remaining roadways could be maintained with the number of lanes required under the cumulative plus Lakeborough project traffic condition.

Air Quality

The cumulative impact of all development would result in substantial increases in air emissions. An in-depth study of Central Valley meteorology has indicated, the San Joaquin Valley exhibits atmospheric characteristics similar to the Los Angeles Basin, and could within decades sustain air pollution problems as serious or worse than Los Angeles (California Air Resource Board 1988). A region-wide, programmatic solution to air quality is needed to address cumulative impacts. This is the expected outcome of the San Joaquin Valley Air Quality Management Plan.

Noise

Traffic from cumulative development in the project vicinity is expected to produce a significant adverse noise impact on noise-sensitive uses along most of the local access roads to the project which have been studied.

VI. ALTERNATIVES TO THE PROJECT

Pursuant to CEQA guidelines, a range of reasonable alternatives to the project or to the location of the project must be described [Section 15126(d)]. The discussion must focus on opportunities to eliminate any significant adverse environmental effects, or reducing them to a level of insignificance "even if these alternative would impede to some degree the attainment of the project objectives, or would be more costly ..." [Section 15126(d)(3)]. The effects of these alternatives are examined in less detail than for the project, in accordance with CEQA Guidelines [Section 15126(d)(4)].

Four alternatives and their potential environmental impacts are discussed below. These are the No-Project Alternative, the General Plan Buildout Alternative, the Mitigated Project Alternative, and an Off-Site Alternative.

A. NO-PROJECT ALTERNATIVE

Description

Existing conditions at the 29,500-acre site would remain the same under the No-Project Alternative. No new development would occur at the site.

Impacts

Land Use

The entire site would continue to be used for cattle grazing. Therefore, the No-Project Alternative would result in no adverse impacts to rangeland inventory in the county, whereas the proposed project would result in the conversion of the site from rangeland to developed uses.

Public access to the site would remain limited under the No-Project Alternative, thereby helping to preserve the open space value of the rangeland. However, the No-Project Alternative would not increase the county inventory of publicly accessible open space because the site would remain privately held.

The No-Project Alternative would not result in growth-inducing adverse impacts because access to the rangeland would remain limited, as would area population immigration and infrastructure improvement. By limiting the presence of human activity, rangeland wildfire hazard adverse impacts would also be avoided.

The on-going impacts of county-wide growth on prime-farmland would not be potentially mitigated by the No-Project Alternative. The county inventory of developable land would neither increase nor be relocated as a result of this alternative. Wildfire hazards would not increase if grazing continued.

Soils, Geology, and Seismicity

This alternative would not impact the existing topography. If left in its current land use there would not be any significant hazards to its inhabitants from landslides, earthquakes or adverse soil conditions. The existing rate of erosion would not be accelerated by project grading.

Hydrology and Drainage

This alternative would not impact the existing drainage patterns, surface runoff rates, or surface and groundwater water quality. In addition, under this alternative there would be no increased potential for on-site or off-site flooding.

Vegetation and Wildlife

The No-Project Alternative would result in no project-related impacts to vegetation and wildlife present on the project site. Existing grazing degradation to habitat would continue.

Cultural Resources

The No-Project Alternative would result in no direct or indirect impacts to any identified cultural resources within the Phase 1 area or any, yet unidentified, cultural resources in Phases 2-4. Existing degradation of these resources due to agricultural uses would continue. No further identification or protection of these resources would occur.

Public Services and Utilities

Public services and utilities at the site would remain limited. No off-site water supply would be piped to the site; only minimal well water on-site would be available. No wastewater collection service would be provided at the site; only the few existing septic systems would be available for sewerage disposal. Solid waste would have to be self-hauled to the landfill. No additional demand for landfill space would be required. Fire and police services would still be provided from the nearest stations in Patterson and Modesto, respectively. No additional facilities or staff would be provided at the Del Puerto Hospital. School enrollment growth would remain at five to 10 percent per year, and no schools would be located at the site. The site would remain open space, with no park or recreation area. The site would not have gas or electric extensions from PG&E facilities. Telephone lines would be located along Oak Flat Road only, as they are currently.

Visual Quality

The existing visual quality of the site would be maintained. Internal significant visual impacts would be avoided. Elements which are considered visually interesting would remain unaffected, including the expansive open space, rolling topography, ridgelines, clusters and specimen trees, texture of grasslands, riparian drainageways, and rock outcroppings.

Transportation/Circulation

Under the No-Project Alternative, existing traffic conditions, in the vicinity of the project site would remain. Likewise, cumulative traffic conditions without project development would be as discussed under the cumulative traffic conditions section of the Traffic/Circulation section of the EIR.

Air Quality

Adverse air quality impacts are directly related to vehicle trips. With no new development on the project site, adverse air quality impacts would not occur.

Noise

This alternative would not increase noise on the site or on site access routes.

B. GENERAL PLAN BUILDOUT ALTERNATIVE

Description

Under this alternative, buildout of the Stanislaus County General Plan's (1988) designation for the project site would occur. The site is designated Agriculture. According to Policy Two of the General Plan, development on the property should not interfere with agriculture. The 29,500-acre site is zoned General Agriculture District (A-2-160), which allows a maximum of two dwellings per 160 acres. The Agriculture designation is consistent with A-2 (General Agriculture) zoning.

General Plan buildout under the current zoning would result in subdividing the site into 184 160-acre parcels and developing two residences per parcel, or 368 residences total. However, if a future General Plan buildout proposal is accompanied with a zoning ordinance amendment to allow clustering, then under the current General Plan designation/zoning the allowable 368 residences could be potentially configured in a manner to reduce many potential environmental effects of 184 160-acre parcels. Because buildout under this "current General Plan/amended zoning" scenario would be environmentally superior, it is a feasible interpretation of buildout under the

current General Plan. Consequently, the General Plan Buildout alternative in this EIR is considered, in effect, to be two alternative scenarios: 368 residences with and without clustering.

Other proposed uses would be a winery and a golf course. The winery would be allowed if it is associated with vineyards at the site. According to Policy 2.5, limited visitor-serving commercial uses are allowed provided that they promote agricultural production. The Stanislaus County Planning Commission would determine whether or not a winery would be acceptable under A-2 zoning. The General Plan does not directly address the inclusion of a golf course on agricultural land. However, the Stanislaus County Zoning Ordinance (Section 21.20.030 G.2.p.) allows golf courses if a use permit is obtained. Facilities, such as a clubhouse, pro-shop, swim and tennis facilities, and food and drink facilities, associated with the golf course would be allowed (Robert Kachel, Stanislaus County Department of Planning and Community Development, October 1991).

Impacts

Land Use

160-Acre Parcels. This alternative scenario would result in converting rangeland sufficient to support 368 residences. The feasiblity of full-scale grazing operations would be reduced because lease agreements would potentially involve dozens of homeowners. Because development and roadway access would be throughout the 29,500-acre site, open space quality would be substantially reduced from existing conditions. Although on-site population would be substantially reduced from the project proposal, rangeland wildfire hazard would be comparable to the project proposal, because of similar widespread public access to the site.

Clustered Development. The General Plan/clustered alternative would result in the conversion of rangeland acreage sufficient to support 368 clustered residential units. While the entire site would not be converted to developed uses as in the proposed project, the General Plan Buildout alternative would result in a limited adverse impact to the county rangeland inventory. Most of the site would continue to be used for cattle grazing.

Public access to the site would be potentially improved under the General Plan Buildout, but residents occupying 368 households would require less extensive road access than the proposed project's approximately 13,000 residents occupying 5,000 households. The General Plan Buildout Alternative would convert less open space rangeland to residential and commercial uses, and would thereby preserve more county open space. Limited public access to the site would decrease adverse impacts to rangeland wildfire hazard, as compared to the proposed project.

Soils, Geology, and Seismicity

160-Acre Parcels. The potential impacts on the topography from grading needed to accommodate buildings, utilities, and roadways would be significantly less than the proposed project. Likewise the adverse effects of grading such as soil displacement, disruption, compaction, and over covering would also be significantly reduced. Less grading would require fewer cut and fill slopes which could be potentially unstable, and less removal of vegetation which could increase erosion. Under this alternative project, fewer structures and utilities would mean fewer impacts from adverse soil conditions. This alternative would subject a significantly lower number of residents and employees to seismic hazards within the site.

Clustered Development. This alternative scenario would further reduce potential impacts on the topography from grading, due to clustered development and fewer roadways than the 160-acre parcels scenario. The adverse effects of grading would be reduced in a manner similar to the 160-acre parcels, requiring fewer cut and fill slopes and less removal of vegetation. Also similar to the 160-acre parcels, this alternative would subject a significantly lower number of residents and employees to seismic hazards within the site.

Hydrology and Drainage

160-Acre Parcels. Because this alternative would allow a maximum of 368 dwelling units and a limited amount of commercial and resort development on the site, the potential drainage and water quality impacts would be reduced. Less required grading would significantly reduce the potential for creek sedimentation and necessity to underground tributary drainages to accommodate development. Project surface runoff generated would be substantially lower than the proposed project, reducing the potential for erosion and flooding. Due to the smaller scale of this alternative project, the expectant amounts of urban pollutants would be less than the proposed project.

Clustered Development. Potential drainage and water quality impacts would be further reduced from the 160-acre parcels scenario because the developments would be localized in one area. Similar to the 160-acre parcels, project surface runoff would be substantially lower than the proposed project and the expectant amounts of urban pollutants would be less than the proposed project.

Vegetation and Wildlife

160-Acre Parcels. Impacts would be reduced in all of the proposed project phase areas, because of the avoidance of a concentration of development. By spreading-out the siting of development, impacts to habitat could be avoided. However, introducing roadways and human activity throughout the site would result in some areas of disturbance compared to existing conditions, and without adequate mitigation may impact species of concern.

Clustered Development. This alternative would result in a reduction of impacts to vegetation and wildlife, if project development is confined to the Oak Flat area which would result in a significant reduction of cumulative impacts to vegetation and wildlife in and adjacent to the project site. If Orestimba and Crow Creek drainages are to remain undisturbed, potential impacts to San Joaquin kit fox potentially present in the lower elevations of these drainages would not occur.

Potential impacts to vegetation and wildlife present in the Phase 1 Area would likely remain the same as with the project. Impacts to species of special concern, including the prairie falcon nest site adjacent to the Phase 1 Area and to the San Joaquin kit fox, would likely remain the same as with the project.

Cultural Resources

160-Acre Parcels. As no inventory of cultural resources has been prepared for the entry road and other roadways, it cannot be determined whether any as yet unidentified cultural resources would be directly impacted. However, any cultural resources in that area might be indirectly impacted as a result of unauthorized artifact collection, looting, and other forms of vandalism. As no inventory of cultural resources has been prepared for Phases 2-4 and no specific plans have been prepared, potential impacts to any as yet unidentified cultural resources in these areas cannot be determined at this time. Both the entry road and any development of the rest of the site might potentially impact directly or indirectly any cultural resources present.

Clustered Development. Adopting the General Plan Buildout Alternative would potentially and indirectly impact cultural resources within the Phase 1 Area in a manner comparable to the proposed project. Phase 2-4 areas may be indirectly impacted by the introduction of population on Phase 1. Impacts along the entry road would be similar as the 160-acre parcels alternative.

Public Services and Utilities

160-Acre Parcels. Although the General Plan buildout alternative would include much less development, especially residential development, than the

proposed project, on-site surface- and groundwater supplies would still not be adequate to serve the project. Off-site sources would have to be obtained, and if delivered as raw water, as they are for the proposed project, these sources would have to be treated on-site. In addition, to serve development pipelines would traverse the whole site, except where individual wells have successully been constructed. With an average of 80 acres per home, septic systems would be viable for most, if not all, homes, although problems could occur if leach fields are necessary on sloping lots.

This scenario would lower response time of police, fire, and ambulance services due to limited access to outlying homes. Curbside garbage pickup would not be feasible. Because the number of school-age children from this alternative would not warrant a new on-site school, students would attend schools in the Newman Crows-Landing Unified School District. This would primarily impact the already over-capacity elementary and middle schools. Recreational opportunities would be provided at the site in the form of golf courses, and swim and tennis facilities. Electricity and telephone lines would be extended to development. Individual propane tanks and satellite dishes would be used to avoid extending natural gas and TV cable throughout the site.

Clustered Development. Problems associated with providing water would be similar to the 160-acre parcels, except that water would be piped only in the Phase 1 area. Septic systems would not be suitable for the clustered 368 dwelling units and golf club and associated commercial facilities. Therefore, a wastewater disposal system would be needed.

Because residences and other facilities would be clustered, curbside pickup of solid waste would be feasible. This alternative would add to the County landfill, but not as much as the proposed project would. In order to provide adequate response time, fire, police, and ambulance services would have to be provided at the site. Students would attend Newman-Crows Landing schools. Impacts associated with pipelines and cables would be reduced from the project proposal and the 160-acre parcels scenarios, because development would be concentrated in the Phase 1 area.

Visual Quality

160-Acre Parcels. This scenario would disperse development, mitigating the levels of impact in all the Phase areas. Although, visual quality impacts would be substantially reduced from the project proposal, some impact would result, because custom homes would be built in areas throughout the site that are currently open space lands.

Cluster Development. Most development of this alternative would be concentrated in the Phase 1 portion of the site. Because of the rural,

undeveloped character of the existing site, any substantial development would result in significant impact to existing conditions of the Phase 1 area. This alternative, with 368 homes, is considered a substantial development, although it is very reduced from the proposed project and would significantly affect a smaller portion of the site. Consequently, areas which avoid development due to this reduced development scenario would avoid all visual impacts.

Transportation/Circulation

Both scenarios would generate similar daily and peak hour trips. In addition, other traffic and circulation impacts would be similar.

These alternative scenarios would generate about 3,500 daily and 270 AM and 370 PM peak hour trips. The traffic impacts along Oak Flat Road would be substantially lower than the mitigated project. Oak Flat Road, while upgraded to County standards, could be maintained as a two lane facility. Traffic signals may be needed at Ward Avenue and Oak Flat and Sperry Roads. Without the Lakeborough recommended interchange, the existing interchange, at Fink Road, could serve the General Plan configuration. Signalization may be warranted under cumulative conditions within the I-5/Fink Road interchange.

Air Quality

160-Acre Parcels. A reduction in the number of units from 5,000 to 368 would significantly lessen project ozone precursor emissions. It is probable that the SJVAQMD would consider this alternative's air pollutant emissions as significant.

Cluster Development. Emmission levels would slightly increase with this scenario above the levels of the 160-acre parcels, because homes would be located throughout the site, instead of just in the Phase 1 entry areas.

Noise

Both scenarios would generate similar levels of noise. The site's remote rural location would prevent construction noise from adversely affecting noise-sensitive receptors in the County's nearest population centers. However, compared to existing conditions, audible impacts would occur to the noise environment in the vicinities of local roads closest to the site. Because traffic would be reduced from the proposed project, the off-site traffic noise impacts on the more populous east area (I-5 and other roadways) would be substantiallly less than the proposed project. Traffic from cumulative development in the project vicinity is expected to produce adverse noise impacts of significant levels on noise-sensitive uses, under the no project, General Plan project scenarios, or proposed project alternatives.

C. MITIGATED PROJECT ALTERNATIVE

Description

Under this alternative, buildout of the Draft Specific Plan would occur as proposed, except for the following:

- The 100 estate residential units, ranging from three to 40 acres, would not be permitted within the Conservation Areas abutting the five villages. Those units could potentially be replaced by increased density of development in the development areas.

- Grading on slopes greater than 25% would not be permitted. This may require relocation of dwelling units and other structures to flatter slopes, and may increase densities of developed areas.

- The dwelling units of the four proposed cul-de-sac areas east of the Oak Flat Parkway would be relocated to the level Oak Flats area.

Impacts

Land Use

The Mitigated Project Alternative would reduce several of the impacts caused by the proposed project, although some impacts would remain. Rangeland would be converted to developed uses and result in an unavoidable adverse impact to the county inventory of rangeland. Growth-inducing impacts would result from infrastructure installation, population immigration and improved public access. Inducement to growth along the lower area of Oak Flat Road would result despite its relocation under the Mitigated Project Alternative.

The relocation of residential units planned for slopes greater than 25 percent, as stipulated by the alternative, would result in changes to the land use plan which would cause more densely clustered developments. However, the number and characteristics of developments in the Mitigated Project Alternative would be the same as those in the proposed project.

The County's inventory of open space would be increased equally by both the proposed project and the Mitigated Project alternative, but the quality of the open space under the alternative would be higher due to estate development restrictions and reduced development east of Oak Flat Parkway. The alternative would not allow for development of estate lots in the open space of the project site, because the estate lots and their supporting infrastructure would have adverse impacts on the open space.

Soils, Geology, and Seismicity

Under this alternative, the potential geologic and soils impacts would be significantly reduced from the proposed project. The amount of necessary grading and associated erosion and slope instability impacts would be greatly reduced through elimination of the estate lots in the Conservation Areas, the proposed development on slopes greater than 25 percent, and the realignment of the access road to the level area parallel to I-5. Elimination of the proposed development areas east of Oak Flat Parkway in Phase 1 would result in the removal of four specific areas of significant proposed cut slopes. The potential seismic impacts could be slightly reduced through reduced grading activities.

Hydrology and Drainage

Under this alternative the potential impacts to site hydrology and water quality could be slightly reduced through concentration of development areas below hillside areas of greater than 25 percent slope. Though concentration of development areas, the amount of tributary creeks to be undergrounded though village areas could be reduced. The realignment of the primary access road from the undeveloped canyon to the level area along I-5 would traverse three fewer creeks and therefore would be expected to have a slightly reduced potential for adverse hydrogeologic and water quality impacts. Assuming the same amount of proposed development under this alternative as with the proposed project, the expected potential impacts to surface water and groundwater quality though contact with urban pollutants in runoff would be the same. The amount of expected surface runoff from the site would be similar to the proposed project.

Vegetation and Wildlife

Potential significant impacts to vegetation and wildlife could be reduced by the removal of estates from the Conservation Areas, the elimination of lots from hillsides, the reduction of lot size and the development of more high density housing in concentrated areas. This would result in higher wildlife habitat value by the presence of greater areas of continuous undisturbed habitat.

Potential significant impacts to vegetation and wildlife could be reduced by the location of wildlife corridors approximately one-quarter mile wide between Village 1 and Villages 3 and 4; and, between Villages 3 and 4 and Village 5.

Potential significant impacts to the San Joaquin kit fox known to occur in the vicinity of the proposed primary access road could be reduced by the re-location of the primary access road east of Highway 5, between the Delta-Mendota Canal and the California Aqueduct.

Cultural Resources

Adoption of the Mitigated Project Alternative would not appreciably lessen direct or indirect impacts to cultural resources within the project area unless the Conservation Areas were extended to include all identified cultural resources. Indirect impact threats would remain. Potential direct and indirect threats to any, as yet unidentified, cultural resources in Phases 2-5 cannot be determined at this time.

Relocation of the proposed connection of the proposed access road with Oak Flat Road from the Del Puerto Canyon route to one east of Highway I-5 would avoid directly impacting any, as yet, unidentified cultural resources along that portion of the route. However, as an inventory of cultural resources along the entry road route east of Phase 1 has not been prepared, potential direct threats to any, as yet, unidentified cultural resources cannot be determined at this time. Indirect impacts to any such resources may result from this alternative.

Restricting construction to slopes less than 25 percent grade would not reduce either direct or indirect impacts to cultural resources in the project area. Relocation of construction to "flatter" areas may actually increase potential direct impacts to any cultural resources in Phase 1 area and elsewhere in the project area. Flat areas near water are likely areas for both prehistoric and historic cultural resources.

Public Services and Utilities

Because the distances to structures would be decreased in the mitigated project alternative, infrastructure extensions would be shorter and emergency response time would be improved. Water and sewer lines would not have to be extended to outlying development. This alternative would relieve the need to pump water to the outlying areas. Curbside collection of solid waste would be easier because less area would have to be covered. The fire, police, and ambulance emergency response time to residences moved from the Conservation Area, cul-de-sacs, and steep slopes would be improved. Park and recreation space in the hills would be improved because no residential development would intrude. As with water and sewer lines, extension of gas, electric, telephone, and cable lines would be easier in the mitigated alternative.

Visual Quality

This alternative would have significant visual impacts, but they would be reduced compared with the project. The elimination or the estates and cul-de-sac homes would enhance the visual quality of the Conservation Areas. If homes are relocated off of hillsides, this would have a beneficial effect to the visual quality of the hillsides as viewed from below. Increased densities of residential areas may potentially impact visual quality, although these impacts

could be offset through sensitive use of site planning. architectural, and landscaping plans.

Transportation/Circulation

The Mitigated Project Alternative would generate approximately 98 percent of the trips generated by the proposed project. The slight reduction of two percent would not result in any significant change in impacts compared with the proposed project. Therefore, impacts would be comparable to those discussed for the proposed project.

Air Quality

Because there is no net reduction in housing units (and, consequently, vehicle trips), the air quality impacts for this alternative would be the same as for the proposed project.

Noise

This alternative would have slightly reduced on-site construction and transportation noise levels from the reduction of the estate lots.

D. OFF-SITE ALTERNATIVE

Alternative Site Selection Criteria

Selection of potential off-site alternatives to the project was based on three criteria:

1) The site must be greater than 10,000 acres to accommodate the primary objective of the project sponsor to create a planned residential and resort community.

2) The site must be located in the eastern slopes of the coast ranges west of Interstate 5. Within Stanislaus and Merced counties, there is a high potential of finding a relatively remote location as required for development of a planned destination resort "within a comprehensive open space system."

3) The site must have an existing access road.

Three sites were chosen which satisfy these criteria (Figure VI.D-1: Locations of Offsite Alternatives and Proposed Project Site). The discussion of the sites focuses on the extent to which they meet the criteria and their potential for eliminating or reducing environmental impacts. The zoning, current uses, and

terrain of the sites are discussed in order to determine their similarity to the Diablo Grande site (Table VI.D-A: Potential Offsite Alternatives).

Discussion of Alternative Sites

Off-site Alternative #1 consists of 28 parcels in Stanislaus County and 11 parcels in Merced County comprising 32,495 acres. The site, known as the Simon-Newman Ranch, is located between Interstate 5 and the Coast Ranges in Stanislaus County. The northwestern boundary of the site borders the southeastern boundary of the Diablo Grande site. Existing access to the eastern boundary of the site is provided by Pete Miller Road and Sullivan Road. Similar to the Diablo Grande site, Off-site Alternative #1 is designated General Agriculture in the Stanislaus County General Plan. Within Stanislaus County, approximately two-thirds of the site is zoned A-2-160 (two dwelling units per 160 acres), and one-third, along the eastern portion of the site, is zoned A-2-40 (two dwelling units per 40 acres). The Merced County portion of the site is zoned A-2, Exclusive Agriculture. The site is used for grazing and for a small gravel operation. Five residences, one hunting cabin, four barns, six sets of corrals, and numerous sheds are on the site. Approximately 20,000 acres are flat to rolling terrain (ATC Realty Ten, Inc., 1989).

Off-site Alternative #2 is located on the 13,254-acre Quinto Ranch. The site comprises 35 parcels (12,554 acres) in western Merced County and three parcels (700 acres) in southern Stanislaus County. The site is bounded by Interstate 5 to the east, the Romero Ranch to the south, foothills of the Diablo corrals, and sheds are located on the site. McCabe Road and Red Mountain Range to the west, and hunting lands and rangelands of the Simon-Newman Ranch to the north. Existing access to the site from Interstate 5 is via Butts Road. Ranch buildings, fences, wind turbines, and agriculturally-related structures are located on the site. The site is zoned A-2, Exclusive Agriculture, in Merced County, and A-2-160, General Agriculture in Stanislaus County. The site is used for cattle grazing and some irrigated farming. Approximately two-thirds of the site consists of rolling hillsides (ESA, June 1986).

Off-site Alternative #3 is a 28,370-acre site in Merced County, Santa Clara County, and Stanislaus County. The site is known as the Romero Ranch. The site is located approximately seven miles northwest of the city of Los Banos and three miles west of the city of Santa Nella. Interstate 5 is located to the east of the site. The Diablo Range crosses the western portion of the site. The site is bounded by the O'Neill Forebay and San Luis Reservoir State Recreation areas to the south and the Quinto Ranch to the north. Four residences are on the site. In addition, a tank house, bunk house, cook house, two barns, Road cross the site, connecting Interstate 5 to Santa Clara County, where they dead-end just over the county line. The Ranch also has direct access from Highway 152, which connects with Highway 101. The site is zoned A-2, Exclusive Agriculture with a 160-minimum parcel size, A-R, Agricultural Rural, with a minimum parcel size of 20-160 acres depending on slope, and A-2-160, Agriculture in Stanislaus County. The site is within an Agricultural Preserve in

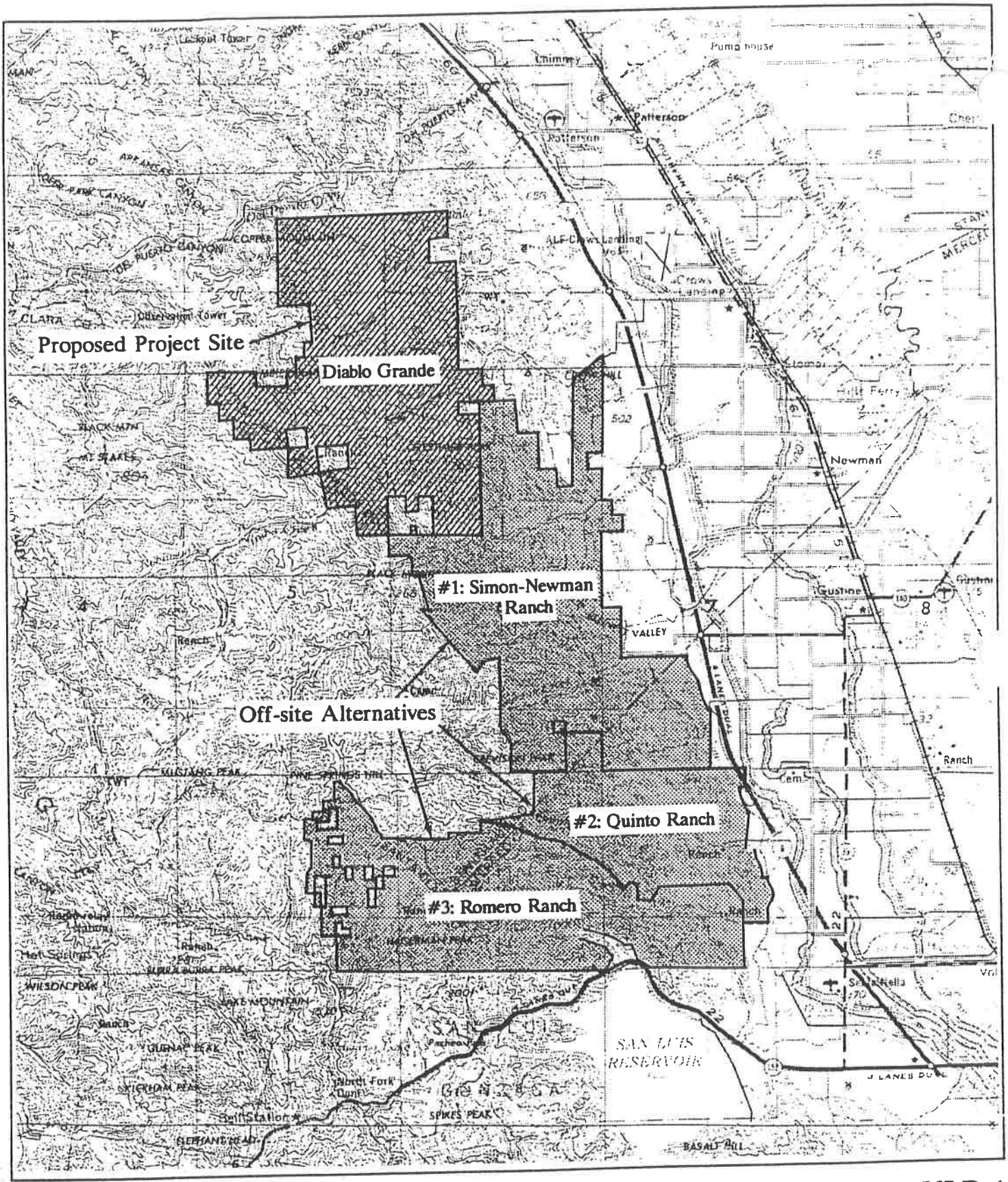


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Figure VI.D-1

Locations of Off-site Alternatives and Proposed Project Site

Table VI.D-A - Potential Off-Site Alternatives

Site	Ranch Name	Size (Acres)	Access Roads	County[1]	Zoning[2]	Current Uses	Approximate Acres of Flat to Rolling Terrain
1	Simon-Newman	32,495	Pete Miller Road Sullivan Road	Stanislaus Merced	General Agriculture, Exclusive Agriculture	Grazing, small gravel operation, 5 residences and farming structures	20,000[3]
2	Quinto	13,254	Butte Road	Merced Stanislaus	Exclusive Agriculture, General Agriculture	Grazing, irrigated farming, ranches and farming structures	8,700[4]
3	Romero	28,370	McCabe Road Red Mountain Road	Merced Santa Clara Stanislaus	Exclusive Agriculture, Agricultural Reserve, General Agriculture	Grazing, 4 residences and farming structures	16,000[3]

[1]Counties appear in order of decreasing acreage.
[2]Zoning classifications appear in the same order as counties.
[3]ATC Realty Ten, Inc., 1989.
[4]ESA, June 1986.

Santa Clara County only. Most of the site is used for grazing. Approximately 16,000 acres of the Ranch are flat or rolling terrain (ATC Realty, 1989).

Selection of Off-site Alternative

All of the sites generally meet the selection criteria. The Simon-Newman Ranch and the Romero Ranch are closer in acreage to the Diablo Grande site than the Quinto Ranch. The Simon-Newman Ranch and the Quinto Ranch are located between Interstate 5 and the Coast Ranges. All of the off-site alternatives have an existing access road. Off-site Alternative #1, the Simon-Newman Ranch, was chosen as the off-site alternative for analysis in this EIR because it contains approximately the same acreage, is nearest to the proposed project site, is located primarily in Stanislaus County, and is topographically representative of other potential sites in the area. Of the off-site alternatives, the Simon-Newman Ranch presents the greatest acreage of flat or rolling terrain.

Description

The proposed project would be the same at the Simon-Newman Ranch as at the Diablo Grande site. A total of 5,000 dwelling units, six golf courses, several active and passive recreation areas, and resort facilities would be located on the site. The majority of development would occur in the more level lands in the eastern portion of the site. Development similar to Phase 1 would be located in Bennett Valley. In addition to 2,000 residences, two golf courses, and a few parks, this development would include a town center, research campus, shopping center, a resort, a heliport, a vineyard and winery, and a polo center. The four remaining golf courses, and denser residential areas would be located in the northeast corner of the site between Crow Hill and Orestimba Creek and in the south east in the Whitney Canyon area. Conservation Areas would be located in the steeper slopes east of Orestimba Peak and Black Mountain, and north of Crevison Peak. Linear parks and additional Conservation Areas would be located along the creeks.

An extension of Pete Miller Road and Sullivan Road would provide access to development around Garzas Creek. An additional access would be needed for the development around Orestimba Creek. Currently, these areas are predominantly zoned A-2-40 (two dwellings per 40 acres). Although the site is zoned to accommodate greater density than the Diablo Grande site, it would still require rezoning and a General Plan amendment to accommodate all of the proposed residential, resort, office, commercial, agricultural, recreational, open space, and other uses.

Impacts

Land Use

Moving the proposed project to the Off-site Alternative would transfer in most of the impacts caused by the proposed project off of the project site and to the alternative location. Cattle grazing is the existing land use of the Off-site Alternative and would be eliminated by project development. As with the project, this conversion would result in a significant and unavoidable impact to the County inventory of rangeland.

As with the proposed project, upgrade of the access to the alternative site would result in an unavoidable growth-inducing adverse impact. However, the County inventory of publicly accessible open space would increase, although the proposed site would likely increase the inventory by a greater number of acres. The Off-site Alternative adverse impacts to rangeland wildfire hazard would be similar to those of the proposed site.

Soils, Geology, and Seismicity

The topography of the western half of this alternative site location is very steep, similar to that of the proposed project. The highest points of elevation include Black Mountain at 2,268 feet (msl) along the site's western boundary and Crevisoin Peak at 2,103 feet (msl), along the southern boundary. The eastern half of the site has more moderately sloping terrain within the 500- to 800-feet elevations. The site has several creeks and smaller water bodies traversing through it, the largest of which includes Orestimba, Garzas, and Long Canyon creeks.

No landslides have been mapped on this alternative site. However, a large area of slope instability is located along the southern side of Crow Creek, approximately one mile west of the northernmost extension of the Simon-Newman Ranch. The entire site, with the exception of the northeastern segment is mapped by the County as having a high potential for landslides.

Splays of the Tesla-Ortigalita fault are located within the western and southwestern portion of the ranch. Development within these areas could pose additional seismic hazards from ground rupture. The distance from the western boundary of the alternative site from the main trace of the Tesla-Ortigalita fault is approximately one and one-half miles. The San Joaquin fault lies within one and one-half miles of the eastern boundary of the site. The potential seismic impacts of groundshaking, liquefaction, and seismic induced landsliding would be similar to those of the proposed project. Development within the low-lying Orestimba Creek flood plain would represent the area of greatest liquefaction potential.

Soils within the Simon-Newman Ranch have not been mapped by the U.S. Soil Conservation. However, the Soil Conservation has indicated that since the

Simon-Newman Ranch is generally along the same north-south lineation and the same elevations as the Diablo Grande site, the soil types that can be expected to occur here would be similar. The soils would be alluvium derived from the Coast Range mountains with general similar physical and chemical characteristics as those found on the Diablo Grande project site (Keith Azevedo, U.S. Soil Conservation, Patterson Office, personal communication, October, 1991).

Hydrology and Drainage

This alternative project site has seven roughly eastern-flowing creeks traversing it. The creeks (as they occur from north to south) include Orestimba, Oak Gulch, Mule Gulch, Garzas Creek, Bear Gulch, Brown Gulch, and Mustang Creek (flows south to Quinto Creek south of the site). The largest watershed within this alternative project site is the Garzas Creek watershed. The watershed covers 57.3 square miles above where Garzas Creek passes under I-5. Elevation in the drainage basin ranges form 2,600 feet (msl) in the western portion of the basin to less than 250 feet near I-5. Rainfall conditions are similar to those at the proposed project site. According to the 1990 WQA, the water quality of Garzas Creek is of good condition. Limited water quality sampling conducted on Garzas Creek (further east of the site) by the RWQCB indicated very low concentrations of salt, boron, selenium and molydenum (RWQCB, 1991). Potential hydrological and water quality impacts associated with development of the proposed project at this alternative site would be similar to those of the proposed project.

Vegetation and Wildlife

Potential impacts to vegetation and wildlife resulting from project development of the Simon-Newman site would be similar or greater than impacts to biological resources in the Diablo Grande project site. The Simon-Newman site potentially supports larger stands of oak woodland and chaparral habitats. Several major drainages are present and these may support stands of riparian woodland. The lower reach of Orestimba Creek supports a significant stand of western sycamore (*Platanus racemosa*), which may extend into the Simon-Newman site.

Potential impacts to species of special concern would likely be greater in the Simon-Newman site. All of the plant and wildlife species present or potentially present in the Diablo Grande site are potentially present in the Simon-Newman site. The Simon-Newman site would likely have a greater impact on the San Joaquin kit fox (*Vulpes macrotis mutica*) and on one species of special concern not likely to be present in the Diablo Grande site, the Swainson's Hawk (*Buteo swainsoni*).

The Simon-Newman site encompasses a significantly larger area of low topographic relief than is found in the Diablo Grande site. These areas of low

relief include the eastern portions of the site, from the mouth of Mustang Creek northward to Garzas Creek, and portions of Bennett Valley northward to Crow Hill. These areas of low relief are likely to provide suitable foraging and breeding habitat for the San Joaquin kit fox.

Stands of western sycamore and other riparian woodland species potentially present in the portion of Orestimba Creek in the project site could provide nesting habitat for the Swainson's hawk. The species has been observed nesting in the lower reach of Orestimba Creek, west of Highway 5 (Schmoldt per. obs.). The areas of low relief could provide foraging habitat for the Swainson's hawk.

Cultural Resources

Selection of an Off-Site Alternative would avoid all direct and indirect impacts to identified cultural resources in the Phase 1 Area, and any yet unidentified cultural resources in Phases 2-5. However, the potential alternative sites, namely the Simon-Newman Ranch, the Quinto Ranch, and the Romero Ranch fall in essentially the same environmental setting as the project. Therefore, numerous, as yet unidentified prehistoric and historic cultural resources are likely to be present and potentially impacted, either directly or indirectly, by this option. The number, location, quality, and threats to any such cultural resources cannot be determined without preparation of both an inventory of cultural resources for the areas in question, and formulation of specific development plans.

Public Services and Utilities

As with the proposed project site, extensive infrastructure improvements would be required. Additional facilities, staff, and equipment would be required to provide adequate fire and police protection, schools, and parks and recreation areas. Provision of public services and utilities would be more complicated for the off-site alternative than for the Diablo Grande site because it is located in both Stanislaus County and Merced County. However, according to the description of the development at the site, all of the development would be located in the Stanislaus County portion of the site.

Several horizontal wells serving livestock are located along Mustang Creek in Merced County (ATC Realty, Inc., 1991). No other wells are reported on the site. Water for the scale of the proposed development would not be supplied adequately from on-site resources. Infrastructure to supply the site with off-site water would be required. On-site water treatment plants would be needed.

Septic tanks would also not be adequate to provide for the development. Infrastructure and on-site treatment plants would have to be provided.

Generally, due to the steep terrain, lack of County roads and distance from fire and police stations, emergency response time would be longer to the off-site alternative than to the Diablo Grande site. Because of the rugged terrain and condition of the access roads, the off-site alternative has a higher wildland fire potential than the Diablo Grande site. Initial response would be from the Newman station of the West Stanislaus Fire Department and back-up would be from the Crows Landing and Patterson stations. While Diablo Grande is rather centralized for response from the initial and back-up fire stations, the off-site alternative is much further from the back-up stations (Richard Gaiser, pers. comm.). In order to provide acceptable response times, fire stations would be needed.

The off-site alternative is in the response area of the West Side Hospital District. This District and the Patterson Hospital District, which serves the Diablo Grande site, have a joint powers agreement to provide ambulance service. An ambulance would have to located at the site.

The portion of the site in Stanislaus County would be located in the Newman-Crows Landing School District and the portion in Merced County would be located in the Gustine School District. If development does occur in the Merced portion of the site, it may be possible for students to attend the Newman-Crows Landing School District with the rest of the development (Edward Williams, pers. comm.). Impacts would be similar as with the proposed project, and it is likely that an elementary school would have to be located at the site.

Gas and electric service would be provided by Pacific Gas and Electric Company. There are no gas lines west of Interstate Highway 5 in the vicinity of the project site. Extensions from a Standard-Pacific line on the east side of the highway would be required. Electric transmission lines run through the east side of the property, parallel to the highway. A substation would be required to provide electricity to the site (Roger Dial, pers. comm.).

The northern portion of the site is located in the service are of Evans Telephone. The rest of the site is serviced by Pacific Bell. The closest Evans telephone lines are located along Oak Flat Road. Telephone and cable extensions would be needed.

Visual Quality

This alternative would introduce similar visual quality and visual resource impacts as developing the proposed site but relocated to the south. In addition, the access road and entry area may be visible to off-site views, and so some consideration off-site viewsheds of the site may be appropriate in addition to the internal viewsheds. As with development of the Diablo Grande site, the visual quality of this alternative site is dependent on topography, ridgelines, vegetative cover, and riparian drainageways.

Transportation/Circulation

The Off-site alternative, located on the Simon-Newman Ranch, is expected to produce the same land use plan as the mitigated project. Therefore, the daily and peak hour trip generation will most likely be similar. The access for the project would be via Peter Miller and Sullivan Roads. Peter Miller Road would be a minor access as it does not connect with I-5 but does provide access to Eastin Road to the east of I-5. Sullivan Road would provide the major access as it intersects with I-5. Sparks Road would need to be relocated to the west of its current alignment to accommodate intersection spacing, expanded roadway capacity and intersection turn movement lane improvements within the Sullivan Road interchange. Major traffic impacts will occur along Sullivan and Eastin Roads. Additional impacts would be expected along State Route 140 (Sullivan Road east of I-5), within the community of Gustine and along State Route 33 between Gustine and Crows Landing. Secondary access will be required at Orestimba Road unless Sullivan Road to the west of I-5 can be constructed as a four-lane arterial. Given the configuration of the Simon-Newman Ranch secondary access will most likely be required for police, fire and emergency access to the site.

Air Quality

Because this alternative has the same design as the proposed project, the air quality impacts would be relatively similar. However, because the alternative site is farther south, average off-site trip lengths would increase. The longer trip lengths would cause more pollutants to be emitted, thus increasing the adverse air quality impacts for this alternative.

Noise

Internal noise impacts of this alternative would be similar to those of the project. Off-site noise impacts would be of similar magnitude as the project, but relocated farther south on I-5.

E. ENVIRONMENTALLY SUPERIOR ALTERNATIVE

According to CEQA, Section 15126(d), the EIR must identify the environmentally superior alternative. If the No-Project Alternative is the environmentally superior alternative, as is the case here, the EIR shall identify an environmentally superior alternative among the other alternatives. The General Plan Buildout Alternative has been determined to be the environmentally superior alternative. All environmental impacts identified in this EIR would be less under this alternative than with the proposed project or other alternatives, excluding the No-Project Alternative.

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APPENDIX A: CULTURAL RESOURCES BACKGROUND REPORT

INTRODUCTION:

At the request of Mr. Richard Grassetti of LSA, Point Richmond, California, Holman and Associates has prepared an preliminary inventory of cultural resources within the Phase 1 Survey area of the Diablo Grande Development Project in near Patterson, Stanislaus County, California.

THE PROJECT:

The Diablo Grande Development Project area consists of some 30,000 acres of land in the hills and Mountains east of Patterson and Highway 5 (Map 1). Phase I of development within the project area would consist of only 1500 acres of land in the vicinity of Oak Flat and the hills that surround it (Map 2). the proposed Phase 1 Project includes a mix of single and multi-family residential units, recreational facilities such as golf courses, parks, commercial units such as restaurants, shopping center,. and vineyards. A town Center and associated facilities are also proposed. Improvements and realignment of the existing access road are also proposed to link the area with HWY 5 to the east. Plans for wastewater facilities, open space, nurseries, and research campuses have recently (1991) been formulated for that portion of the Entry Road Area within the Diablo Grande Ranch Development Project Area.

Phase 2 through 4 Areas of the Project have yet to be designed so that no precise statements of planned development in these areas can be made at this time. However, a preliminary surface reconnaissance of the Phase 2 through 4 area was made in 1992.

CULTURAL RESOURCES RESEARCH:

Holman and Associates was requested to conduct a literature search of the entire 30,000 acres of the project area for previously recorded prehistoric or historic resources. Holman and associates also agreed to conduct a site reconnaissance restricted to the area of Phase I. A report of findings was submitted to the Client (Holman and Associates 1990). This report included an inventory of potential cultural resources, and recommendations for further research, including historic archival research on the Phase 1 Area and recording of the prehistoric sites identified in 1990. This recommended research was carried out in fall, 1991, and the results are presented below.

Subsequent to the original surface reconnaissance in 1990, the western boundary of the Phase 1 Project Planning Area was shifted east so that several identified resources are now located outside the Phase 1 Project area. However, the findings within the original boundaries are discussed here in their entirety. However, discussion of potential impacts to cultural resources and recommendations for mitigation reflect the new boundaries. Another alteration of the original Phase 1 Project plan was the addition of the Entry Road Area to the eastern edge of the Phase 1 Survey Area.

THE RESULTS OF THE LITERATURE SEARCH:

In 1990, Holman and Associates submitted copies of the four relevant USGS Quad. sheets (Patterson, Orestimba Peak, Copper Mountain, and Wilcox Ridge) marked with the project boundaries and access road to the Central California Information Center at Stanislaus State University in Turlock, California. Their records indicate that the nearest surface reconnaissance to the project area was conducted by Holman and Associates in the Beltran-Shumake parcel within one mile of the eastern border of the Diablo Grande Project area (Holman 1988). Their records a also indicate that only two cultural resources had been previously recorded within the indicated areas on the maps (Appendix I). These are CA-STA-33 and CA-STA-41. It is not clear whether the recent additions and realignment of the proposed access road are covered in this record search.

CA-STA-33 was recorded by James Bennyhoff in 1956 as an occupation midden 1.2 miles from Oak Flats Ranch (Appendix I). The site was recorded on both sides of Salado Creek and included a sizable midden deposit, at 29 bedrock mortars, pictographs and two "rain rocks".

CA-STA-41 was recorded F.F. Latta in 1950 along Oak Flats Road outside the Phase 1 Survey Area. The site was described as an occupation site at a spring at the location of the "old Salty Smith place" along Salado Creek. A mortar was noted at the time of the site's recording.

The cover letter from the Central California Information Center indicates that the project area has not been systematically surveyed prior to 1990. Their opinion that numerous cultural resources must be present within the project area is supported by Holman and Associates professional experience in the area. Therefore, a surface reconnaissance of the entire project area must be undertaken to adequately identify the cultural resources present that might be impacted by the project.

THE PHASE I SURVEY AREA- NATURAL SETTING:

The Phase I project area comprises approximately 1500 acres and is defined by a large oval boundary drawn between the ridge tops of the hills surrounding Oak Flats (Map 2). As a result of bedrock mortars being observed along Lotta Creek by biologists surveying the Phase I area, Mr. Grassetti added this drainage to the area of surface reconnaissance to be conducted by Holman and Associates. The Phase I survey area falls on parts of both the Patterson and Copper Mountain USGS Quad sheets (Map 2). The survey area includes all of Section 24, all but the southeast corner of Section 25, the northeast half of Section 26, the southeast half of Section 23, the southeast corner of Section 14, the southeast half of Section 13,the southwest quarter of Section 18, the west two-thirds of Section 19, the northwest quarter of Section 30, the northwest edge of Section 36 and the northeast corner of Section

Oak Flats lies at an elevation of approximately 1,000 feet above sea level and some of the surrounding ridges reach elevations of 1600 or more feet. Salado Creek flows through Oak Flats from the southwest to the northeast boundary of the survey area. A series of low knolls is present to the north of Salado Creek along much of its course through the survey area. A number of drainages join Salado Creek from the surrounding hills., one of which is Lotta Creek at the southwest edge of the Phase survey area. (Map 2). Other more ephemeral drainages are also present in the hills as well. The area is characterized by a variety of sedimentary rocks such as sandstone/shales and conglomerates, outcrops of which are common in much of the survey area.

Vegetation in the area today is an open oak woodland and grassland that is virtually treeless over much of the area of Oak Flats. The surrounding hills and high ridges are more heavily covered with oaks. The southwestern and northeastern portions of Salado Creek flows through these more heavily wooded areas. During surface reconnaissance, occasional junipers were also noted. The entire area has been heavily overgrazed in historic times so that an unknown number of native grasses and other low plants have undoubtedly disappeared. Ground hugging Filaree (Erodium) appears universally throughout the area surveyed. Scattered occurrences of stands of horehound (Marrubium) and gooseberry (Ribes) were also noted. The complete absence of willow (Salix) along the creeks may well be due to historic clearing and grazing patterns in the area.

Abundant birds and mammals were noted during the field reconnaissance. Undoubtedly the most common mammal observed were ground squirrels (Citellus beecheyi). Deer tracks were noted in several locations. The area abounded in numerous small passerine birds, and redtailed hawks (Buteo jamaicensis) were also observed. The scats of unidentified carnivores were also seen while walking within the area.

Although historic modification to the native plant and animal life has certainly occurred, the surviving habitat indicates that the prehistoric Northern Yokuts of the area (Kroeber 1925; Wallace 1978) would have had a variety of food stuffs to draw upon for subsistence.

ETHNOGRAPHIC BACKGROUND:

The Diablo Grande Project Area falls within the western portion of the former territory of the Northern Valley Yokuts, a group of tribes speaking Yokuts, a Penutian language who inhabited the northnern half of the San Joaquin Valley (Kroeber 1926:475; Wallace 1978:462-463). The Northern Valley Yokuts inhabited the San Joaquin Valley from the area between the Mokelumne and Calaveras Rivers south to the foothills sources of the San Joaquin Valley in the south. They inhabited the foothills of the Sierra Nevada along the east side of the Valley, and apparently used the

west side of the valley up to the crest of the Diablo Range (ibid.). However, recent analyses of Mission records suggests that the boundary between the Ohlone and the Yokuts may have actually been at the western edge of the Central Valley (Milliken 1982; Parkman 1986:247).

The Yokuts followed a hunter-gatherer lifeway drawing upon the plant and animal resources of the San Joaquin Valley, and the adjacent foothill areas. River fish and waterfowl werre important sources of protein, although deer, elk, and small game were also hunted. Acorns, grass seeds, tule roots, and other plant foods were important stables in the Yokuts diet as well. A sophisticated tool kit of flaked stone hunting, scraping, and cutting tools, ground stone mortars, pestles, manos and metates, assorted baskets, and other artifacts of wood, bone, and fibers was employed by the Northern Valley Yokuts to collect, transport, store, and prepare these foods throughout the year.

The Northern Valley Yokuts were composed of small named tribes, each of about 300 individuals who exploited the resources of their territory (Kroeber 1925:484-486; Wallace 1978:466). Generally, the population of a tribe was concentrated in a principal village where the headman resided, although smaller settlements, some with two or three houses were also in use. Principal villages were primarilly located on the valley floor on mounds or high spots along the rivers and watercourses, which sometimes flooded. Seasonal camps located where important resources, such as acorns or seeds, were collected and these would be briefly inhabited in season, by people from the principal or outlying settlements. Tribal exogamy was apparently preferred in order to broaden social and trade contacts throughout a greater area of the Yokuts. However, marriages within the tribe were common.

Each tribe recognized and was guided by a headman or chief, who resided in the principal settlement (Kroeber 1925:496-497; Wallace 1978:466). Chieftainship was patrilineally inherited, generally from father to son, although women occassionally held the position. Some of these leaders were influential over an area several days' journey. They were respected for their wisdom, generosity, and ritual powers. Trade with surrounding Yokuts tribes and other linguistic groups yielded raw materials such as mussel and abalone shells, as well as foods and implements. Warfare was rare, although skirmishes between different tribes and between the Yokuts and their nighborhood did occur.

Religion revolved around public ceremonies and shamanism. Bear, Rattlesnake, and weather shamans were known among them (Kroeber 1925:511-518; Wallace 1978:468). The dead were either cremated or buried, with their possessions and gifts from their mourners. An annual public mourning ceremony was held at the end of summer where the dead were remembered and mourned, and additional property was destroyed (Kroeber 1925:500). Adolescent boys were initiated into manhood in the Jimson Weed iniation (ibid.:502-504). This powerful plant drug was administered to the iniate after fasting, and produced both intoxication and powerful visions.

Afterwards, the youths were introduced to myths and proper behavior.

ARCHAEOLOGICAL BACKGROUND:

Early research in Central California, especially the Sacramento Delta and northern San Joaquin Valley region resulted in the so-called Central California Taxonomic System (Beardsley 1948, 1954; Lillard, Heizer and Fenenga 1939). This system recognized and desceibed a sequence of three successive stages of development or "horizons" based on both stratographic differences and cultural traits. Recent chronological placement of these divisions suggest that the "Early Horizon" dated ca. 2500 B.C.-ca. 1500 B.C., the "Middle Horizon" dated to ca. 1500 B.C.- A.D. 500, and the "Late Horizon to ca. A.D. 500-1850 (Moratto 1984:184). This scheme has been attacked and modified repeatedly over the years as too rigid, too uniform, and not horizons at all. As noted by Moratto, archaeological work along the east side of the Diablo Range on the west side of the San Joaquin Valley has generated a distinctive sequence only partly comparable to the Delta sequence (ibid.:189).

Olsen and Payon recognized four cultural complexes along the west side of the northern San Joaquin Valley based on artifacts and burial data collected at a number of sites (ibid.:191; Olsen and Payon 1969). These were:

Positas Complex (ca. 3300-2600 B.C.)

Characteristics include small shaped mortars, short cylindrical pestles, millingstones (manos and metates), perforated flat cobbles, and spire-lopped Olivella shell beads.

Pacheco Complex (ca. 2600 B.C.-A.D. 300)

Earlier Pacheco Phase B (2600B.C.-1600 B.C.) is distinguished by foliate bifaces, rectangular Haliotis ornaments, and thick rectangualar Olivella beads. Later Pacheco Phase A (1600 B.C.-A.D. 300) is characterized by spire-ground, modified saddle, saucer, and split-drilled Olivella bead types, Haliotis disk beads and ornaments, perforated canine teeth, bone awls, whistles, and grass saws, large stemmed and side-motched projectile points, and abundant millingstones, mortars and pestles.

Gonzaga Complex (ca. A.D. 300- A.D.1300)

Distinctive characteristics include bowl mortars, shaped pestles, square and tapered-stemmed projectile points, few bone awls and grass saws, distinctive Haliotis ornaments, thin rectangular, split punched, and oval Olivella shell beads, extended and flexed burials.

Panoche Complex (ca. A.D. 1300- A.D. 1850)

Characteristic traits include small side-notched projectile points,

clamshell disk beads, Haliotis disk beads, lipped, side-ground, and rough disk Olivella beads, a few millingstones, varied mortars and pestles, bone awls, saws, whistles and tubes, flexed burials, as well as primary and secondary cremations.

Many Panoche Complex artifacts resemble those of the "Middle Horizon" of the Delta sequencem but others resemble those to the south and west. The characteristics of the Gonzaga Complex generally conform to the assemblages in the Delta sequence's "Late Horizon- Phase 1", while those of the Panoche Complex are comparable to "Late Horizon- Phase 2) (Moratto 1984:191-193. The western margin of the San Joaquin Valley appears to have been occupied for over 5,000 years by hunter-gatherers who exploited both acorns and game. Evidence suggests that the population and intensity of occupation grew through time. However, while the Panoche and perhaps the Gonzaga occupation are identifiable as Yokuts, earlier assemplages cannot be associated with any particular linguistic groups (ibid.).

The rock art of the western margin of the San Joaquin Valley has been the subject of research as well. a wide range of petroglyph and pictographic sites in the area have been recorded and discussed for the region (Heizer and Clewlow 1973; Parkman 1986;). Parkman's discussion of cupule petroglyphs in the Diablo Range reviewed suggested that cupule rocks probably served a variety of uses in the area (Parkman 1986). Many cupule rocks were located in association with springs or streams and may have served as markers of ownership of water or other nearby resources. Others may have served ritual purposes associated with attempts to affect weather, fishing, hunting, and/or human fertility. Absence of ethnographic data on cupule rocks may reflect a poir data base. However, the possibility that cupules predate the arrival of Penutian speakers in the area cannot be discounted.

HISTORIC BACKGROUND:

Dr. Catherine Julien conducted extensive archival research on the Phase 1 Area (Appendix 1) and the Phases 2 through 4 Project areas and the Entry Road area (Appendix 3). In it, she documented the early pattern of grants and purchases of small parcels of land to individuals and the southern Pacific Railroad in the 1870's-1890's. In the same period, a pattern of consolidation of these individual holdings developed that resulted in six very large holdings or ranches. The Russel B. Smith Ranch, the John W. Jones Ranch and the Manuel Rogers Ranch developed in the Entry Road area, which focussed on agriculture and livestock, especially sheep. The Frederick A. Hyde Ranch (Oak Flat Ranch) resulted from the consolidation of the Northern Area of the Project, including the Phase 1 Area. This area was devoted to sheep raising well into the 20th Century. The ranches of Timothy Paige and John W. Sharp grew in the Southern Area of the Project and were devoted to agriculture, sheep and cattle. Dr. Julien's research provides significant data on the history of land use in the area and background information against which to consider the potential

historic sites found during the surface reconnaissance.

APPENDIX B: HISTORICAL RESOURCES REPORT

A Survey of Historical Source Materials Pertaining to the Phase I Survey Area within the Diablo Grande Ranch Development Project Located near Patterson, Stanislaus County, California

by Catherine J. Julien, Ph.D.

Turlock, California

October 21, 1991

Introduction

To complement the archaeological reconnaissance carried out within the Diablo Grande Ranch Development Project (Phase I survey area, Map 1; Holman and Associates, 1990), a review of available historical records has been conducted. The search was designed to recover as much data as possible with a minimum investment of time. Only records pertaining to the period of California statehood have been considered. The search was focused at the local level in order to locate specific data about historical resources and activity patterns associated with the Phase I survey area.

The report which follows is organized in four sections: a brief background presentation to locate the survey area within a larger historic context and to introduce the types of historical records available; a summary of information about early travel; a discussion of land use in and near the survey area; and a description of specific historic resources found within the survey area or very near it. In the latter case, an effort has been made to identify site locations contained in the preliminary report of the archaeological reconnaissance (Holman and Associates, 1990) using information from historical records.

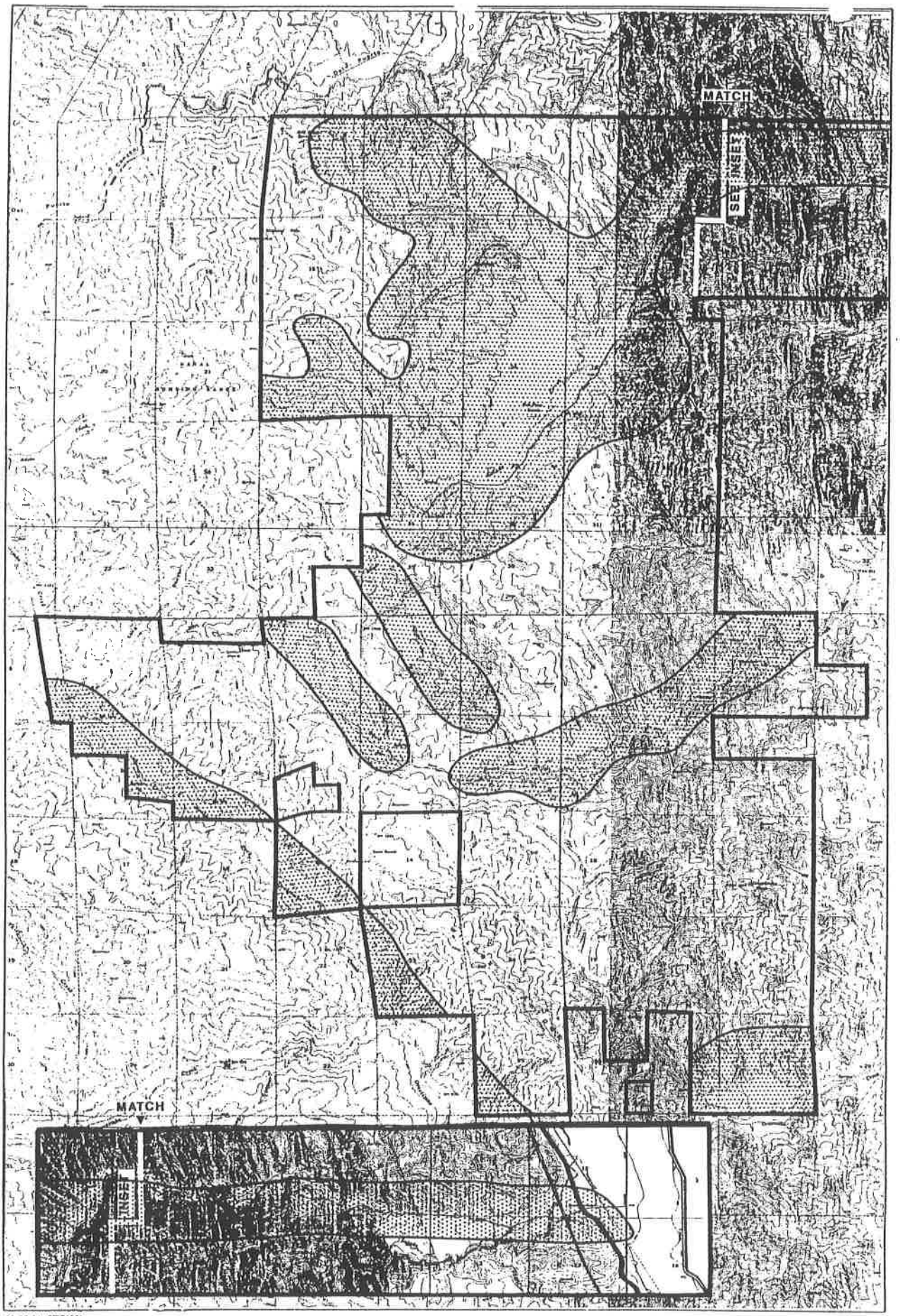
The historical records which turned up in the search related largely to the period from 1875-1900. This is the period during which the population was probably densest, so our focus on this period is warranted.

Background Presentation

The survey area is located on the Eastern slopes of the Coast Range (Map 1). It falls entirely within the boundaries of Stanislaus County, and from the perspective of a Stanislaus County resident, it is located in the hills on the West side of the San Joaquin Valley. When California counties were first established in 1850, the territory was part of a much larger Tuolumne County (Tinkham, 1921, p. 43). In 1854, Tuolumne county was divided, and the survey area became part of a newly-created Stanislaus County (op. cit.).

California is a federal land state. After entering the union, its territory was surveyed into townships (1854-1855). Parcels that had already been granted to private holders under the earlier Spanish and Mexican governments were not surveyed at this time. Titles were confirmed after a lengthy judicial and legislative process and property boundaries were often subject to change. There were no such grants to land in the West side hills of Stanislaus County. Early titles are consequently clearer, but we know less about the use of this land prior to California statehood and in the decades immediately following because no grants were made.

The settlement of the West side hills of Stanislaus County has always been fairly sparse. There were no towns in the hills. The two early towns on the flatlands of the West side near the San Joaquin River where there was a fairly dense agricultural population were depopulated around the turn of the 20th Century. Moreover, neither appears to have published a newspaper. The lack of any local newspapers on the West side of Stanislaus County in this period greatly diminishes the amount of contemporary information available to



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Map 1

N

LSA

Scale in miles

0 .5 1

Areas Surveyed in Villages 1 - 5

us. Sources for historical research on periods that are beyond the scope of modern memory are largely limited to public records and maps.

· The spelling of names varies in early written records. For example, Salado Creek appears to have been called Salida Creek in the1870s. The term salida means "exit" in Spanish. originally Salida Creek. The name Solada Creek (solada means "sunny" in Spanish) also appears in the records. The term used at present, salado, means "salty" in Spanish. We should be careful with any attempts to derive a meaning from the Spanish name. Del Puerto Creek (Spanish: del puerto, "of the port"), which suggests a reference to the San Joaquin River, was earlier known as Arroya de la Puerta (Spanish: de la puerta, "of the door") because the canyon narrowed as the creek reached the flatlands and the opening was doorlike. The creek known as Lotta Creek appears with the name "Latta Creek" on the 1919 maps (United States Geologic Survey, Mt. Boardman quadrant, 15' series). Latta is the name of a West side family with roots in the Gustine area.

Early Travel

Early maps allow us to document the existence of a road along Salado Creek that the Phase I project area in the early years following California statehood. When Stanislaus County first authorized the construction of a county road through the West side hills in 1876 its course utilized a portion of an existing road along Salado Creek (see Oak Flat and Adobe Valley Road, below).

The existence of an early road along Salado Creek is confirmed in the notes of the Federal Survey of California (United States Federal Survey, 1854-55). The section line established between Sections 25 and 26 (T6S, R6E) during that survey crossed Salado Creek 2079 feet North of the common corner, and crossed a road another 2240 feet to the North (United States Federal Survey, 1854-55, T6S, R6E, page 201).

Early maps of California show wild variations in the courses of roads through the Coast Range, but a road between San Jose and Grayson (Map 2), a ferry port on the San Joaquin River, can be substantiated on state maps published in the early 1850s.

The map of Zakreski and Hartmann (1851) shows a road that heads slightly North from San Jose, before bearing Northeast through the Coast Range to Grayson on the San Joaquin River. At the crest of the Coast Range, the words "Pecheco Pass" are written. In this case, the label appears to be wrong. The course of the road over Pacheco pass is well known. It left San Juan Bautista and reached the San Joaquin River at Firebaugh's Ferry, considerably to the South of the road indicated on this map. The only other road through the Coast Range on the Zakreski and Hartmann map leaves the East Bay considerably North of San Jose and passes through Livermore and the Altamont area before heading off toward Stockton. The Altamont road is also well-documented and may have been the most heavily travelled road into the interior of California in the 1850s. Two roads are shown, but the existence of three routes -- Altamont, San Jose-Grayson and Pacheco Pass -- is probable.

A second map of the same date (Butler, 1851) again shows only two roads across the Coast Range in this area. One is the Pacheco Pass road, correctly drawn. The other is the road from San Jose to Grayson. This time the Altamont Road does not appear.

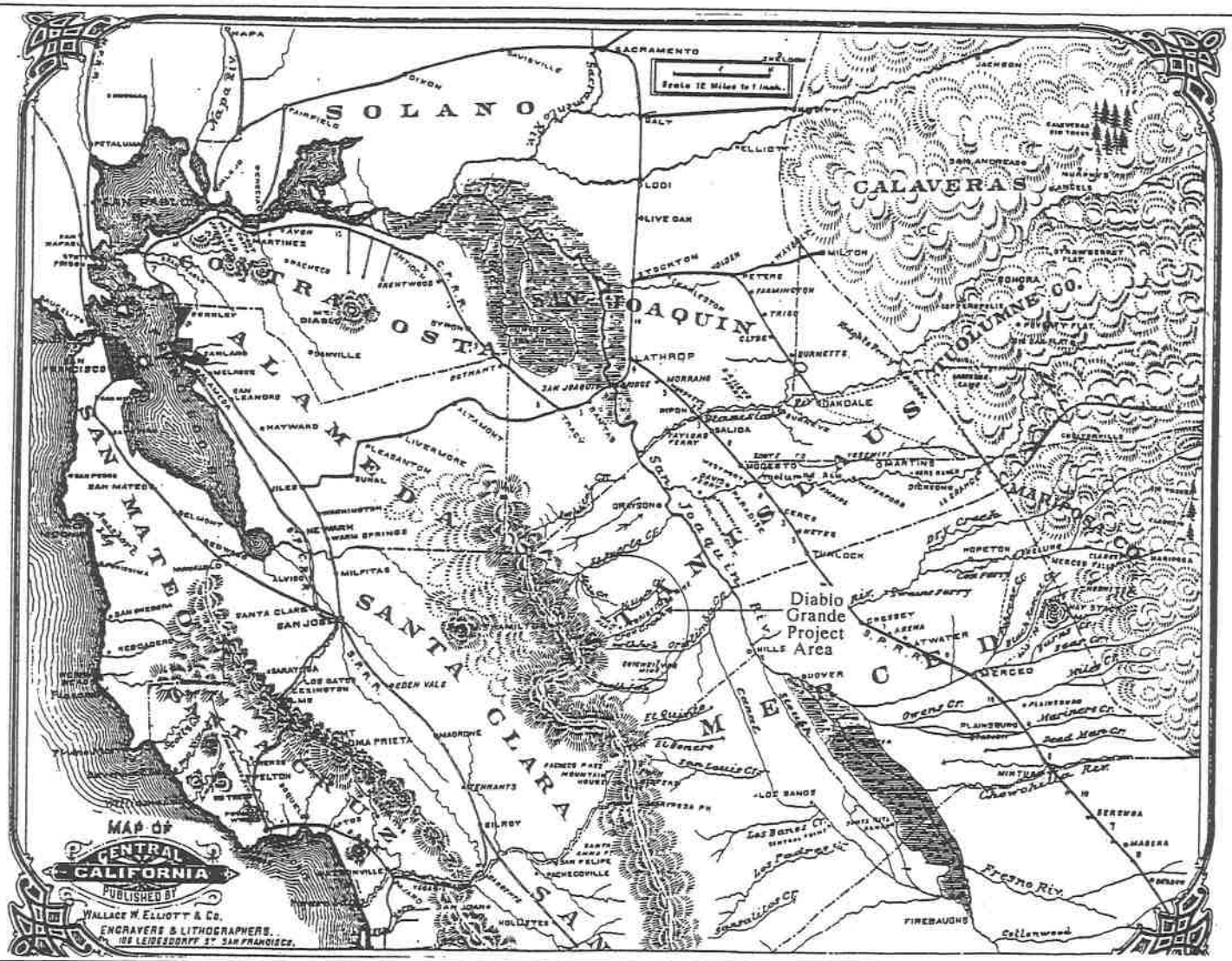
The Britton & Rey Map of 1853 shows three roads, but their courses are not the same as those shown on the earlier maps. The road which reaches Grayson on the San Joaquin leaves from San Leandro, not San José. The road which eventually reaches Stockton diverts from the afore-mentioned road before Livermore and bears Northeast through the hills.

Our greatest difficulty with identifying where the San Jose-Grayson road passes through the West side hills is that none of the early maps show creeks or other topographical features, so that we cannot relate the road's course to some landmark. The first map to depict any of the creeks was drawn in 1854 (Eddy), and neither this map nor any of the later maps show the San Jose-Grayson route. The Eddy map shows one creek: the Arroyo del Piedras [sic: de las Piedras]. There is no creek of this name on modern maps. It flows South before turning to the Northwest to reach the San Joaquin, more like the courses of the Orestimba or possibly Del Puerto Creeks and than like the course of Salado Creek. Although the name resembles Del Puerto, another map which shows a number of West side creeks shows both an "Arroyo de Piedras" and a "La Puerta Creek".[1]

We can hypothesize that Arroyo de las Piedras was the name given to Salado Creek, despite the inaccurate way in which it was sometimes drawn on maps. Salado Creek does not appear on any of the maps of the 1860s and 70s (Nell, 1868; Whitney, 1874 and 1875), although the level of detail shown is fine enough so that Salado Creek should have been included. Salado Creek is a good candidate because of the evidence we have cited from the Federal Survey that a road along Salado Creek existed in 1855. Also, there are plenty of boulders along Salado Creek that might justify a name like "Canyon of the Stones".

An obvious reason for a route through the Coast Range in the early 1850s was to facilitate the great number of travellers to the gold mining region in the East. The three maps on which the road appears were specifically designed to guide miners to the gold region. A ferry crossing was established on the San Joaquin in 1850 at Grayson, and a town plan was laid out concurrently (Branch, 1881, p. 123). Until 1868 when the shipping of wheat on the San Joaquin River began to pick up volume, the only economic reason for the existence of Grayson and other towns on the San Joaquin would have been to facilitate the Eastward travel. Grayson appears with regularity on California maps into the 1880s, and was usually the only San Joaquin River town shown on California maps in either Stanislaus or Merced Counties until Hill's Ferry begins appears in 1874.[2]

A route between the Santa Clara/San Jose area and the San Joaquin Valley may well antedate 1850. During the time Franciscan missions were operated in California (1767 to 1834), Indians were gathered from the San Joaquin Valley to be congregated at mission sites. Santa Clara and San Jose were particularly populous missions. A route from Santa Clara/San Jose to the area of Grayson on the San Joaquin River may well have existed. The population of native Californians was particularly dense on the San Joaquin River in the area downstream from Hill's Ferry (Warner [1832] in Tinkham, 1921, pp. 34-35). This population was the object of missionization and also a center of resistance. The native leader Estanislao, who was baptized at San Jose, defeated military campaigns led by General Mariano Vallejo twice in engagements on the lower Stanislaus River, a river which now bears his name. The campaigns were fought in 1829 (Tinkham, 1921, p. 34), but contact certainly began much earlier.



Source: Branch 1881

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Map 2

LSA Scale in Miles 0 6 12

The Project Area in 1881

Early travel along this route may have resulted in few if any permanent physical traces. Still, where there are springs or pools along Salado Creek, evidence of use by travellers might be found.

Oak Flat and Adobe Valley Road

In 1876 a portion of an existing road along Salado Creek was reused by a new county road: the Oak Flat and Adobe Valley Road. A petition was submitted by Stanislaus County residents in January of that year justifying the expenditure of building a county road:

> ...interests of the mines now being developed [in the] coast range demand the said road and the same would be built at a small expense to the county and would accomodate [sic] a large amount of travel and bring to the county a trade that is now drifting over to Santa Clara County (Stanislaus County, 1876).

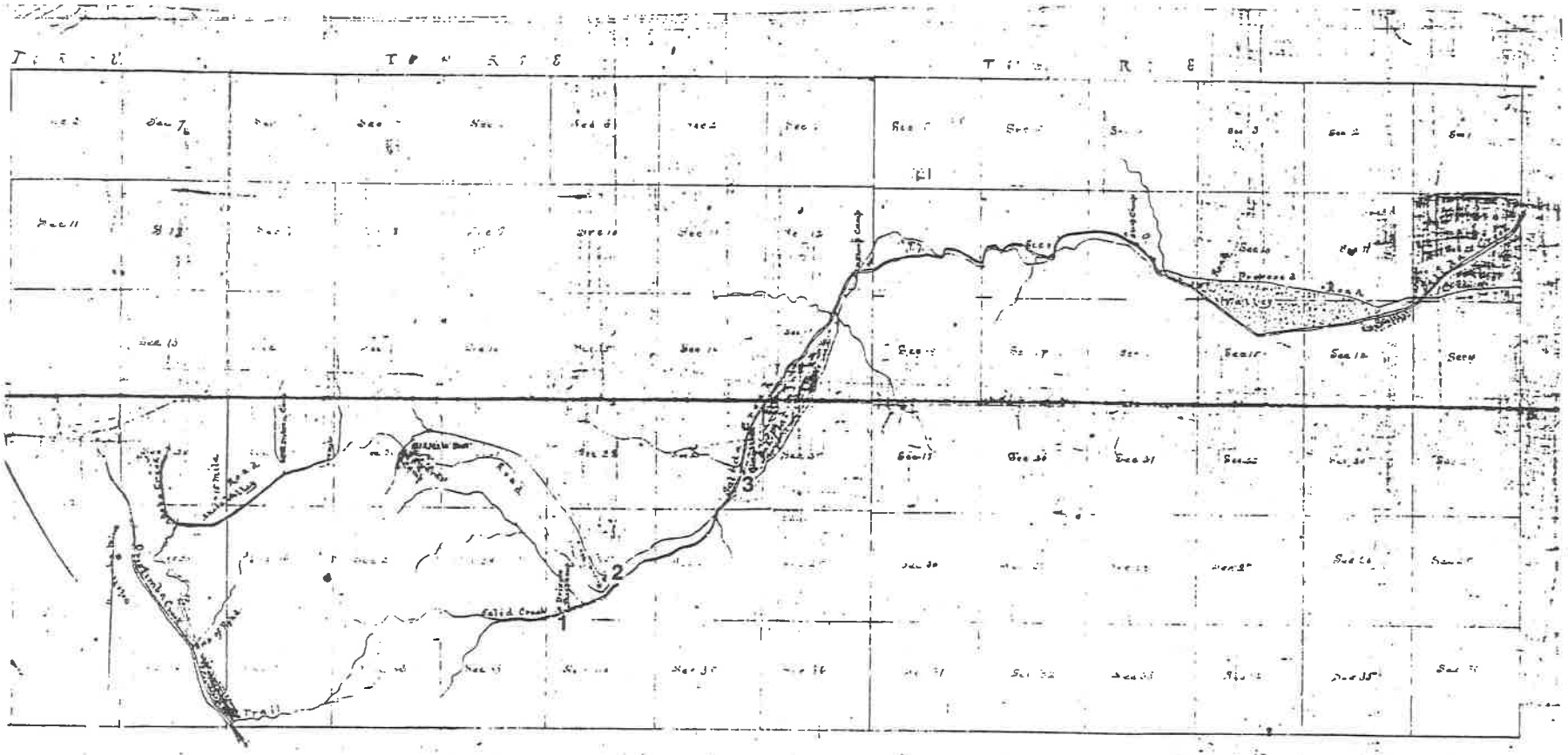
Three or more quicksilver mines, located just below the crest of the Coast Range in Stanislaus County, were then being developed by investors (see section on quicksilver mining, below). The road appears to have been planned only with the idea of providing transportation between the mines and the business centers of Stanislaus County and not to facilitate travel to Santa Clara county. The road reached a point on the North fork of Orestimba Creek near the site of the International mine and was said to end a mile from the Orestimba Mine, though the former does not appear on the 1876 road map (Map 3).[3]

The contract for the Oak Flat and Adobe Valley Road was given to Samuel McVey who was given the following instructions:

> It must be built with easy grade, not to exceed 15º pitch at any place so that a load of 600 lbs to the horse can be easily drawn with an ordinary team, to be 10 feet wide on level ground and at least six feet on solid ground when on side hill and 10 inches higher on the lower or outer side; at turns wide enough for six horses to swing on... (Stanislaus County, 1876)

The cost of the contract was $2400. Money was saved because the road utilized about 10 miles of existing road: that part of the Oak Flat and Adobe Valley Road that followed Salado Creek, as far upstream as Lotta Creek. The cost for improvements to the existing road was estimated at $300 (Stanislaus County, 1876).

The viewers appointed by the county to determine the course of the road submitted a map[4] (Map 3) and a detailed report describing the proposed road by giving a series of reference points and distances between them (Stanislaus County, 1876). Very often, living sites were used as reference points. For example, the sheep camp which appears in Section 9 [8](T6S. R7E) was described in their report as being "Charles Smith's Sheep Camp". This site corresponds to CA-STA-41. The sheep camp identified on their map in Section 12 [11](T6S. R7E) was described as "Hutchinson's Sheep Camp" in their report (loc. cit.). A number of living sites appear on the map in the Phase I survey area and above and will be discussed in some detail in the sections on Land Use and Historical Resources, below. Two petitions to improve or change the road were initiated in the 1890s. They included plats showing living sites or other details that will be discussed below (Maps 4 and 5)(Stanislaus County. 1890-94).



Source: Stanilaus County 1876

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Scale in Feet

0 2640 5280

LEGEND

1 Driver's (March's) Sheep Camp

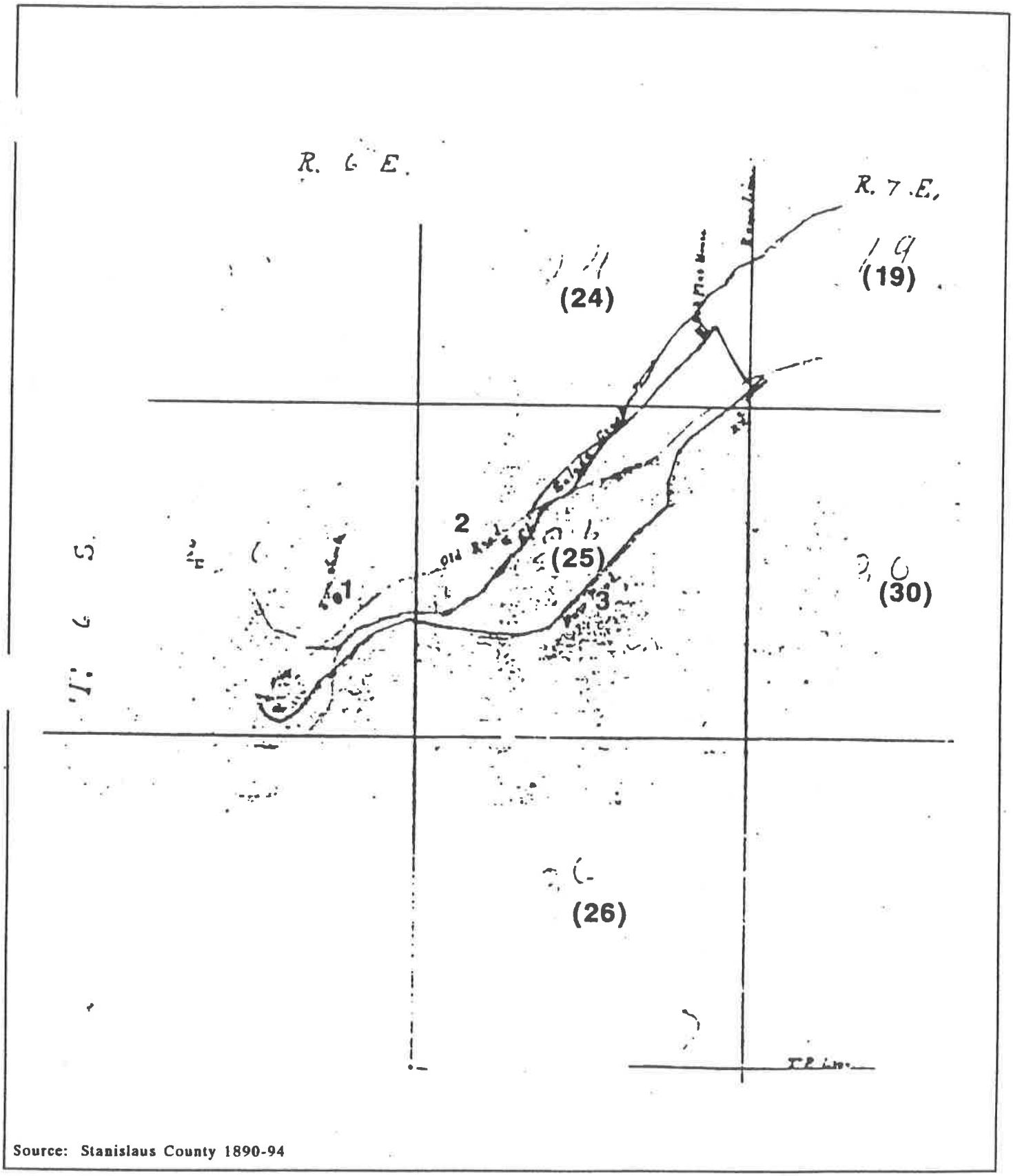
2 Grundika's/Grundike's Camp

3 Oak Flat Ranch

4 Chism's House

Map 3

The Project Area in 1876



Source: Stanislaus County 1890-94

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Map 4

LEGEND

1 "J. M. Choate"
2 Old Road
3 New Road

N

LSA

Scale in Feet
0 1320 2640

The Project Area in 1890-94

Land Use

Cattle and Sheep Ranching

From the mid 1870s until the end of the century, the main economic focus of land use in the Phase I project area was cattle and sheep ranching, primarily the latter. This activity may have gone on as early as 1850 or perhaps even earlier, but the documentary trail does not begin until 1875.

A tremendous expansion of sheep-ranching in California followed statehood. From a population of 17,500 in 1850, the number of sheep expanded to 35,800 in 1852, 1,088,000 in 1860, 2,768,000 in 1870 and 4,150,000 in 1890 (Bancroft, 1890, p. 160). Not only was the increase in wool production brought about by the increase in numbers, but the yield was greatly increased by interbreeding of Spanish and Navaho stock with more productive European varieties. Improved French Merino stock began arriving in 1851, and by 1860, large drives of stock from the Eastern United States were being organized (Wentworth, 1948, p. 167-176, 187).

An important figure in the introduction of French Merinos in the United States was J. D. Patterson, who began to import improved stock from France to Chatauqua County, New York, in 1848, and from whose stock strains of purebred animals were first derived. Patterson purchased 18,000 acres of the former Rancho del Puerto (later expanded to 30,000 acres) on the West side of the San Joaquin River in the 1860s (Wentworth, 1948, pp. 94, 153, 187-188).

Particular circumstances influenced the development of sheep ranching in the San Joaquin Valley. Cattle were predominant in California under Spanish and Mexican rule, and the ranchos that were granted in the San Joaquin Valley were intended to be cattle ranches. One of the ranchos in the West side hills was located in what was later held to be prime sheep range, the Rancho Panoche de San Juan in Merced County, but this grant is unique.

The cattle industry also went through a period of expansion following statehood, but a major setback occurred because of the drought of 1862-64. The cattle population was recorded at 262,000 in 1850 and 2,000,000 in 1862. The droughts destroyed several hundred thousand head of cattle in Northern California:

> ...and created so wide-spread a mistrust as to greatly curtail the industry. It made a perfect revolution in the business, by giving prominence to sheep, by changing many cattle districts to farming regions, and by obliging the adoption of more careful methods, such as the better apportionment of cattle to pasture, and the wide introduction of fencing, partly under compulsory laws. (Bancroft, 1890, p. 53).

The productivity of sheep in California also encouraged expansion. California averaged seven pounds of wool for ewes and wethers from two clippings as against four pounds for the United States on average (Bancroft, 1890, p. 59)

In the San Joaquin Valley, lands on the flood plain of the San Joaquin River continued to be used for grazing even after large-scale irrigated cultivation began. Although today these lands are primarily dedicated to cattle production, in the 1880s they were used to pasture both cattle and sheep (Branch, 1881).

Expansion in the sheep industry occurred largely in the East and West side hills. Some of the changes affecting the cattle industry (the rise of farming, the introduction of fencing) had notable effects on the practice of sheep ranching. Prior to the development of agriculture in the valley, sheep that grazed in the Coast Range in the winter were often taken to the Sierra Nevada for summer pasture. The long sheep trails continued to be common for Southern California sheep, which were herded up the Sierra Nevada foothills to high sierra grasslands, but West side sheep had to find other summer pasture. Agriculture offered the option of grazing sheep on the stubble left from harvested crops, however. The availability of feed in summer probably placed real limits on the productivity of the West side, especially since feed lots were never common.

Still, the West side hills were a primary location for sheep ranching in the United States in the late 19th Century and continued to be economically important until the mid 1960s when New Zealand lamb greatly changed the economics of herding and put many small producers out of business (Al Yribarren, personal communication). On the East side, sheep ranching declined after the turn-of-the-century.[5]

From 1875 until 1890 a pattern of accumulation of land for the purposes of ranching can be documented. Patents were acquired to parcels in the Oak Flat area and a concurrent claim was made to range on the adjacent hill slopes up to the crests of the ridges forming the Salado Creek drainage. From the beginning, a large parcel was in use, but most of the land was not released by the Federal Government for sale until the 1880s and 1890s.

By 1890 the Oak Flat area and adjacent range lands were held in fee simple by a single individual, Frederick A. Hyde. Hyde, in a statement he made when petitioning for a road in 1890, noted that the land was valuable:

> ...chiefly for grazing purposes, and has been and will continue to be so used; but at present, the ranch is not fenced, and it is necessary to herd the cattle and sheep thereon to prevent them from straying East to the farming lands of the various settlers (Stanislaus County, 1876).

Hyde's statement explains the transformation which occurred in the practice of ranching during the decades after 1868, when the No-Fence Law was passed (Radcliffe, 1940, pp. 103-106). Livestock were no longer allowed to range freely; they either had to be herded or fenced in to keep them off of cultivated lands. If we judge by what Hyde said, the changeover from open range to fenced private parcels appears to have occurred somewhat later in the West side hills than in the San Joaquin Valley bottom.

Quicksilver Mining

Another types of land use that can be documented near the Phase I survey area was quicksilver mining. Mine locations in Stanislaus County appear to have been at higher elevations; so far no documentation has been found for mining within the boundaries of the Phase I survey area.

The original stimulus for establishing a county road along Salado Creek up to near the Western boundary of Stanislaus County was to facilitate access to quicksilver mines. Quicksilver mining began prior to California statehood in the Coast Range (New Almaden in Santa Clara County, 1845) and several very productive mines operated in the later 19th

Century (New Idria in Fresno County from the 1870s) (Bancroft, 1890, p. 657). By the mid 1870s, three mining locations in Stanislaus County are known: the Orestimba Mine (see Maps 2 and 3)[6], the International Mine and the Laird Mining Claim.

The Orestimba and International Mines were in production in 1876, and as noted above, stimulated demand for a county road. Neither appears to have been a large or particularly successful operation. More is known about the Orestimba mine, which had its headquarters in Grayson. A newspaper report described activities at the mine in 1876:

> Orestimba Quicksilver Mining Co. From a friend at Grayson we are gratified to learn that the prospects of the Orestimba mine are very flattering. The latest report from the Superintendent shows that about forty tons of pay ore have been taken out of the drift they are now working. Some of the ore is very rich. Two miners and one laborer take out about two tons of ore per day. The company hopes to have enough ore on the dump soon to cover the expense of a furnace. (Modesto Herald, April 1, 1876, p. 5)

Hopes may have been high in 1876, but L. C. Branch, one of the investors in the Orestimba Mine (Modesto Herald, April 1, 1876, p. 4) wrote less enthusiastically in 1881 about the prospects of quicksilver mining in the county:

> Many different companies have operated within this region, but quicksilver mining has not yet been developed to such a degree in this county to render it of any considerable importance. (p. 84)

Another mine, surveyed in 1863 and claimed in 1864 was the Laird Claim located at the headwaters of Del Puerto creek near the county line. Laird was a Stanislaus county resident, but he sold the claim to William Muir of San Francisco in January of 1875 for $7,000 (Stanislaus County, Deeds, vol. 13, p. 572). In March of the same year the claim was sold to the Red Mountain Quicksilver Company for $1.00 and common stock by Muir, then of Contra Costa County (Stanislaus county, Deeds, vol. 13, p. 578). Because of the high price tag for the for the Laird Claim, we can infer that mining was also the interest of Muir and his associates. The Red Mountain mine appears prominently on the 1895 map of Stanislaus County, and we can assume that the mining operation continued throughout this period.

In the 1890s, other quicksilver mines developed in the area, including at least one in Adobe Valley. The initiator of a petition to improve the Oak Flat and Adobe Valley Road (Stanislaus County, Public Works, Road Petition 48A), George Loughead, appears to have been involved in quicksilver mining (Stanislaus County, Deeds, vol. 49, p. 522), as do other signatories (A. W. Loughead and William and Allen Moore, see Douglass and Perley map, 1895; United States Bureau of the Census, 1900 Population Schedules, Newman Township, Household 152). The mining activity continued into the 1940s in this area.

Other Uses

Several other types of land use may have affected the Phase I survey area directly or indirectly including: use of the mineral springs for health reasons, modification of the land or building of facilities by gun clubs, and possibly, the erection of structures for chicken ranching.

The Coast Range was the location of numerous springs, some with properties attractive to people trying to cure various ills. Our only evidence for this use comes from history of Stanislaus County written in 1881 by L. C. Branch who noted:

> The range abounds in springs of sulphur oozing from the ground. The healthful ingredients of these springs have attracted many health-seekers to their fountains of purity, returning them cured of all the 'ills that flesh is heir to'; and, in fact, we have known of several who have settled in these mountains by the side of these rippling brooks and springs, shut out from the cold, bleak winds which sweep over the valleys at certain seasons of the year, for the sole purpose of regaining their health.
>
> Notably Governor Edwards and family, who lived several years in one of the canyons of this range. The Governor was troubled with asthma and has so far regained his health as to be able to live in comfort and enjoy good health in his old age. He is now living at Grayson, in this county, and is apparently free from the malady which had heretofore given him so much trouble and suffering. (p. 79)

Map 3 shows a site named "Edwards' Camp" which may be the camp described above by Branch. "Groondika's Camp", within the Phase I survey area, may also be a health camp of this type. The map appears to consistently note when a camp is associated with sheep husbandry. Unlabelled camps may have been associated with cattle ranching or some other use, and we do not have any conclusive evidence for health resorts in the area. Neither Edwards nor Groondika (also spelled Grundike in Stanislaus County, 1876) appear to have owned the property where these camps were located. They were tenants.

At some point a Gun Club was established on Salado Creek upstream from the Phase I survey area. It appears on the Stanislaus County Township Maps near the South line of Section 20 (T6S R6E). The Township Maps are not dated, but the last pencil entries were made in 1918-21. The Gun Club was therefore in existence during these years.

Finally, one of the property owners in the Phase I survey area, Joseph M. Choate, was engaged in "raising poultry" (United States Bureau of the Census, 1880 Population Schedulse, Orestimba Township, Household 224). His household was listed right after another household that we can locate along Salado Creek, so we can conclude that his poultry business was located on his Salado Creek property (see section on Historical Resources, below, for further description).

Historical Resources

House in 1855

The earliest structure documented in the area was a "house", located just outside the Phase I survey boundary the boundary of Sections 34 and 35 (T6S R6E). It was recorded during the Federal Survey of California (1854-55) in Section 35 (T6S, R6E) (0.4 mile North from the Southwest corner of Section 35 to the point where the section line crosses Salado Creek, and then about 400 feet on a bearing of S 82° E). No other structures were

mentioned in the Phase I survey area or its immediate vicinity, but structures were usually recorded only when they were fairly near section lines.

Driver's Sheep Camp

The 1876 survey of the Oak Flat and Adobe Valley Road shows "Driver's Sheep Camp, located in the Southwest corner of Section 27 [26] (T6S, R6E) on the North side of Salado Creek (Map 3). The road survey did not give a more precise location for the site because the course of the proposed road did not pass Driver's, but turned up along the ridge between two gulches to reach the headwaters of a tributary of Adobe Creek.

There were two Drivers who can be identified with this area. One is John M. Driver who appears in the 1880 Census of the Orestimba township as a member of a household which also included James T. Chism. Chism's residence can be located within the Phase I survey area (see below). He and Chism were both recorded as "stockraisers". John Driver was 28 in 1880 and was born in Mississippi (United States Bureau of the Census, Stanislaus County, Orestimba Township, Household 223).

The other Driver who appears in the records was Samuel Driver, a resident of Stanislaus County who deeded the Southeast quarter of Section 34 (T6S, R6E), to Frederick A. Hyde of San Francisco on December 20, 1889 (Stanislaus County, Deeds, vol. 45, p. 330).

Whoever Driver was, he appears to have been a tenant on the Southwest quarter of Section 26 (T6S, R6E) and not an owner. This property appears as part of the holdings of Frederick A. Hyde on the 1895 County Map (Douglass and Perley). Hyde acquired substantial holdings in Township 6, Ranges 6 and 7 East between 1880 and 1895, but no patent or fee-holder has turned up in a search of the records.

Groondika's Camp, March's Sheep Camp

Groondika's (or Grundike's) Camp was near the roadway proposed in 1876 (Map 3), and so, was used as a reference point in the viewer's description. After the name "Grundike's Camp", "March's Sheep Camp" appears in parentheses (Stanislaus County, 1876). The possible use of Groondike's Camp for health purposes has been noted (see section on Land Use). The archaeological survey identified the remains of a rectangular stone corral on the South side of Lotta Creek (Locus 2H)(Map 5). These remains may well be associated with the sheep camp documented at this site.

A structure appears on the 1876 map (Map 3) near the center of Section 27 [26](SE 1/4 S26, T6S, R6E). This property was patented to Joseph M. Choate in 1889 (Homestead Certificate #1851, dated May 9, 1889; Stanislaus County, Patents, vol. 9, p. 599). The books for the sale of this property would not have been opened much before this time, therefore the structure shown on the 1876 road map had been erected long in advance of the first property transfer and may have nothing to do with Choate who we believe operated a chicken ranch on this property (see Land Use section).

Because Choate was involved in diverting the course of the Oak Flat Road, we can locate his residence in the vicinity of Grundike's (March's) Camp. A Plat was filed to

accompany a petition, initiated by Frederick A. Hyde in 1890, asking to divert the course of the Oak Flat Road to a location further South (fig. 2) (Stanislaus County, 1890-94). On it, a dot that may symbolize a structure is shown. It is labelled "J. M. Choate" and is located just North of the course of the Oak Flat Road in the Southeast quarter of Section 26 (T6S, R6E).

A small square, labelled "Vald" (?) appears near the center of the same section. The square also appears to indicate a structure, since the "Oak Flat House" is identified as a structure in the Southeast quarter of Section 24 (T6S, R6E). Since the square is closer to the spot identified as Grundike's (March's) Camp in 1876, it may have designated a structure surviving from the earlier period.

The quarter section where both of these locations appear was divided between Joseph Choate, who retained the West half, and L. R. and M. S. Choate, who acquired the East half, some time before 1895 (Douglass and Perley).

The occupation site designated as 4H by the archaeological survey appears to correspond to the Choate location (Map 5). The identification of the surface trash as "turn-of-the-century" is not inconsistent with the historic records, since we can place Choate on the property from 1880 to 1895 (United States Bureau of the Census, 1880 Population Schedules, Orestimba township, Household 224; Stanislaus County, 1890-94; Stanislaus County, Patents, vol. 9, p. 599; Douglass and Perley, 1895).

Location in the Northwest Quarter of Section 25 (T6S, R6E)

This same plat (Map 4) shows a dot in the Northwest quarter of Section 25 (T6S, R6E), just north of "Salada Creek". This land had been the property of Stephen Rogers, but was transferred by his widow to Frederick A. Hyde in February of 1890, just prior to his petition for a change in the line of the Oak Flat Road (Stanislaus County, Deeds, vol. 44, p. 483).

The archaeological survey identified a timber platform, windmill and well in this area (Loci 10H and 12H) as well as an isolated ceramic fragment (Locus 11H)(Map 5). These remains may be correlated with an occupation by Rogers.

Oak Flat Ranch and Chism's

A structure is shown on the 1876 road map (Map 3) in the Southeast quarter of Section 23 [24] (T6S, R6E), for which David Hays held a patent (Cert. 5740, dated February 1, 1875; Stanislaus County, Patents, vol. 8, p. 289). A second structure, labelled "Chism's", appears in the Southwest quarter of Section 15 [18] (T6S, R6E). Chism held two patents, one to the Northeast quarter of Section 24 (T6S, R6S)(Cert. 5739, dated April 20, 1875; Stanislaus County, Patents, vol. 8, p. 287) and the other to Lots 8 and 9 in Section 18 (T6S, R6E), consisting of 160 acres or the equivalent of a quarter section (dated September 10, 1880; Stanislaus County, Patents, vol. 8, p. 494).

Together this property was referred to as Hays and Chism in the road petition of 1876. Although two property holders were involved, from this time forward, the Oak Flat ranch appears to have been a single unit comprising Oak Flat and the hill slopes adjacent to

Oak Flat and some distance further down Salado Creek. The ranch appears to have been established for stock raising since its inception. The range claimed by the property owners in Oak Flat appears to have been used to graze both cattle and sheep, although sheep were probably more important, at least in the period from 1870-1890.

At first, only the parcels in Oak Flat described above were held under patent. The hill slopes used for grazing were claimed in 1876 when an interest in the entire ranch was transferred. Hays appears to have removed himself from the business in 1876 when he sold his property to Hiram Gist (dated April 15, 1876; Stanislaus County, Deeds, vol. 15, p. 254). Gist transferred the Southeast quarter of Section 24 (T6S, R6E) and to all the range claimed by Gist and Chism, known as the Oak Flat Range on the "Arroya Solada" which ran from the West line of Section 25 (T6S, R6E) down Salado Creek to the South line of Section 7 (T6S, R7E). The extent of the range claimed was further described as:

> ...from the summit of the hill South of Aroya [Sic: Arroya] de la Puerta [Arroyo South to the summit of the divide between the Salada and Crow Creek (dated May 20, 1876; Stanislaus County, Deeds, vol. 15, p. 251).

This deed transferred not only Gist's real property and interest in the Oak Flat Range, but also, his interest in personal property on this land. This property included:

> ...seventeen hundred and sixty-six ewes. Two hundred and fifty wethers. Twelve hundred and twenty six lambs. Some fifty tons hay. All the corrals houses cabins furniture provisions poultry and any and all other property of whatsoever kind belonging to or claimed by said Gist and Chism (loc. cit.).

The records do not indicate whether Hays or Gist were actively involved on the property or resided there, but the 1876 road map and the 1880 census provide evidence that Chism was actively involved. In the census, Chism was listed as a "stockraiser", age 32, originally from Kentucky (U. S. Census, Stanislaus County, 1880 Population Schedules, Orestimba Township, Household 223). Because he is consistently listed second (Hays and Chism, Gist and Chism), we can hypothesize that he was the junior partner, and that ranch management was his obligation in the partnership.

As noted above, Chism and a man named John Driver were recorded as members of the same household in the 1880 census (loc. cit.). If this Driver can be identified as the one named on the 1876 road map, then there may have been some connection between the two ranching operations. The description of the Oak Flat Range (cited above), however, placed the upper limit at the Western line of Section 25 (26 on the map).

Chism had been partners, first with Hays and then with Gist, in a claim on the Oak Flat Range, noted above. A new business arrangement with these parties came into being in 1877. Chism deeded an undivided 2/3 interest in the quarter section he owned (Stanislaus County, Deeds, vol. 16, p. 223), and Rogers and Walthall deeded Chism a 1/3 interest in the quarter section they had acquired from Gist (op. cit., p. 224).

The arrangement, apparently relying on Chism to manage the operation through at least 1880, continued until Rogers bought his partners out. Rogers died, and his widow transferred his property in Township 6 South, Ranges 6 and 7 East to Frederick A. Hyde in two transactions in1890 (Stanislaus County, Deeds, vol. 44, p. 481, and vol. 44, p. 483). With these two transactions, Hyde became owner in fee simple of 3967.54 acres, including

all of Sections 24, 35, and 36, and the North half and Southwest quarter of Section 25 (T6S, R6E).

In effect Hyde had acquired title to the original ranch properties on Oak Flat and much of the Oak Flat Range claimed by Hays and Chism in 1876. Hyde had also acquired other parcels in the vicinity, and so, enlarged the range available for ranching operations.

Archaeological remains associated with the Oak Flat Ranch were identified on both sides of Salado Creek (Locus 9H)(Map 5). Buildings shown on maps are uniformly located on the Right bank (Southeast). A single structure appears on early maps (Maps 3 and 4). In 1919, three structures appear (United States Geologic Survey, Mt. Boardman Quadrant, 15' series). On recent maps, two structures appear (United States Geologic Survey, Copper Mountain Quadrant, 15' series).

The structure which appears on the 1876 road map (Map 3) in the location of the modern Oak Flat Ranch may have been the residence of David Hays, the property owner. His partner, James T. Chism, is the probable resident of the structure identified as "Chism's" on the same map. The survey did not turn up evidence for an early historic occupation in this area, at or near Locus 13 (Map 4).

The two parcels owned by Hays and Chism came under a single title in 1877, noted above. The location of the modern Oak Flat Ranch probably became the center of ranch operations and principle residence at that time. Chism, a one/third owner of the larger property, may have occupied the Oak Flat Ranch house until the time Rogers bought him out. Later owners or managers probably used the Oak Flat Ranch as the center of operations as well.

Conclusion

Several conclusions can be ventured. Land use appears to have remained constant throughout the later 19th Century: the land within the boundaries of the Phase I survey area was used largely as a sheep and cattle ranch. At the beginning, two owners were involved and appear to have established separate ranch residences. Nonetheless, they probably formed a partnership. A large range was claimed, so that, from the start, a fairly large holding existed. A pattern of accumulation followed, to consolidate title to the range originally claimed and to add to it.

The archaeological survey has documented a number of locations which correspond very well with the data from historic sources. No trash accumulations were located that indicated an 1870s or earlier occupation, however, although historic sources identify activities that involve either permanent or temporary residence in the area from 1875 onward.

Some deficiencies in the historic record are also evident. So far, the maps that have been located only indicate that structures existed at various locations. They do not provide detail about ranch houses, outbuildings, corrals or other built features. Photographs or assessment records might provide additional data to aid archaeological survey or excavation, although the latter cannot be located at present.

The search that has been conducted so far has covered published sources obtainable in Stanislaus County and county records. Specialized research libraries, federal and state

records, photographs, oral sources and newspapers may yet provide important information about the survey area, but they require a more intensive effort with a potentially smaller yield and have not been included in the present search.

Although some sources remain untapped, a great deal of information about human activity along Salado Creek has already turned up in this search. We know a great deal more about activities in the 1870s in the Phase I survey area because of the road financed by Stanislaus County in 1876 and the property transfer that described the sheep herded on the property. We have been able to coordinate historical data with the archaeological survey, and so, expand our picture of human activity in the area.

Notes

1. Nell, 1868. The map shows the following creeks, from North to South, in the West side hills of Stanislaus County: Hospital Creek, Arroyo de Piedras, La Puerta (which reaches Grayson), another with no name, and Orestimba. Perhaps the order of the names Arroyo de Piedras and La Puerta Creek is wrong. The placement of the West side creeks was clearly problematic for early mapmakers. For example, the Bancroft map (1864) shows Orestimba Creek flowing into the San Joaquin near the mouth of the Stanislaus River, and South of it, the Arroyo de las Piedras.

2. Grayson recovered after the drought of 1871-72, and was still a settlement of some size in 1881, but it did not survive into 1900 (Branch, 1881, p. 123).

3. Modesto Herald, April 13, 1876, p. 5. The newspaper noted the building of the new county road in an article on the Orestimba mine: "Work was commenced on the new county road of the Salida [Salado] to the International mine on Monday. It will pass within a mile of the Orestimba mine, and it is the intention of the company to build a road connecting the Orestimba mine with it." The location of the International Mine is problematic. On the 1895 county map, its name is near the South line of Section 3 (T8S, R6E), some 7-8 miles away from the end of the Oak Flat and Adobe Valley Road as it appears on Map 3.

4. The labelling of the section grid shown on the viewer's map (Map 3) is incorrect. They have mistakenly shifted the grid one section to the West. In the Oak Flat area, for example, Section 23 should be 24, Section 27 should be 26, and so on. When I am describing this map, I will refer to the numbering they give and show the correct number afterwards in square brackets [ ].

5. Some of my statements about East and West side sheep ranching come from a reading of several histories of San Joaquin Valley counties written in the early 1880s and from a more particular study of the Assessor's Records of Merced County.

6. The location of the Orestimba Mine is in error on Map 2 where it is shown at a lower elevation than Oak Flat. The place labelled "Quicksilver Mine" on the same map may represent the International Mine (Douglass and Perley, 1895). See note 3 for more details.

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